

SECTION III A

CONTRACT AGREEMENT

This Agreement, made and entered into this 20th day of December, 2017, between the CITY OF OREGON CITY ("CITY"), acting by and through the City Commission and Andy Medcalf Construction Co. ("CONTRACTOR").

Witnesseth, that the CONTRACTOR and the CITY, for the considerations stated herein, agree as follows:

ARTICLE I - Scope of Work

The CONTRACTOR hereby agrees to furnish all of the materials, equipment and labor necessary, and to perform all of the work for the project entitled: **City of Oregon City Community Development TI** in accordance with the contract documents which are hereby made a part of this agreement.

The contract documents consist of:

Invitation to Bid Scope of Work Instructions to Bidders Bid Proposal and Bid Schedule Compliance with ORS 279C.840 Resident Bidder Status Certification of Drug Testing Program Non-Collusion Statement Asbestos Certification Registrations Certification of Non-Discrimination Certification of Compliance with Tax Law Bidder Responsibility Form Bid Bond First Tier Subcontractor Disclosure Form Customer Service Acknowledgment Form Contract Agreement Oregon City Public Improvement Standard Conditions	Statutory Conditions to Contract Agreement Performance Bond Payment Bond State of Oregon Statutory Public Works Bond General Conditions Prevailing Wage Rates for Public Works Contracts in Oregon dated July 7, 2017 Prevailing Wage Apprenticeship Rates dated Oct. 1, 2017 Definitions of Covered Occupations for Public Works Contracts in Oregon dated Jan. 1, 2017 Special Provisions Contract Drawings Technical Specifications Addenda: 1-6 All items included within these Contract Documents.
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The order of items cited above does not constitute an order of precedence different than that established in the special or standard specifications. Equivalent titles, which may be substituted for the above listed items, are included as if specifically named.

ARTICLE II - Time of Completion

The project shall be complete within 128 days from the Beginning of Contract Time as identified in Section II A page 2 of the Bid Proposal and Bid Schedule, or more specifically established as substantial completion by March 31, 2018 and final completion by April 13, 2018.

ARTICLE III – Contract Amount

The Contract Amount for the work covered by this Agreement is estimated to be eight hundred fifty-four thousand five hundred eighty-two dollars (\$854,582).

ARTICLE IV - Warranty and Quality of Work

In addition to all other warranties, express or implied, that are part of this Agreement, the Contractor expressly warrants to the City for a period of one year from acceptance of the work by the City that all materials and equipment furnished under this contract will be new, unless otherwise specified, and that the work will be of good quality, free from faults and defects and in

conformance with the City's specifications. Work that does not conform to these standards shall be considered defective.

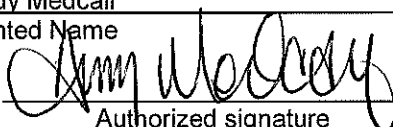
Contractor shall, at its own expense, make good and repair any and all defects arising from faulty workmanship or materials, if the defective work is discovered within the one-year warranty period and notice thereof is given to the Contractor within 60 days after the expiration of the warranty period. If required by the City, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment used to repair the defect.

In witness whereof, the parties hereto have executed this agreement, the day and year first above written.

CITY OF OREGON CITY

Andy Medcalf Construction Co.

by: _____
Anthony J. Konkol III
City Manager

Andy Medcalf
Printed Name
by: 
Authorized signature
PRESIDENT
Title

by: _____
Laura Terway, AICP
Community Development Director

Federal Taxpayer ID Number:
47-0880237

Approved as to Legal Sufficiency:

Address:

By: _____
City Attorney

1485 20th St SE
Salem, OR 97301

City Commission Award Date:

INVITATION TO BID CITY OF OREGON CITY

BIDS DUE 3:30PM, FRIDAY, NOVEMBER 17, 2017

Sealed bids for furnishing all materials, equipment, labor, and services for the construction of the Oregon City Community Development Department for the City of Oregon City (City), Oregon will be received by Laura Terway, AICP, Community Development Director, at 221 Molalla Ave, Suite 200, Oregon City, until 3:30 PM local time on Friday, the 17 of November, 2017. Bids received after this time will not be considered. All bids received prior to the due date and time will be publicly opened and read on the due date and time in the Oregon City Building and Planning Conference Room.

The work to be performed under these specifications and drawings consists of furnishing all labor, materials, services, and equipment necessary to complete construction as described in the construction documents issued by the architect of record.

Solicitation documents may be obtained from the City's online plan center free of charge at <http://bids.orcity.org/>. Solicitation documents may be obtained by creating a new user account and registering for the project. General information including the planholder list is available to the public without registering.

Solicitation documents are also available for review at the City of Oregon City Building and Planning Department, 221 Molalla Ave, Oregon City, Oregon, 97045 (Telephone: 503.722.3789), between the hours of 8:30 a.m. and 3:30 p.m., Monday through Friday, except legal holidays.

Addenda, clarifications and notices will be distributed through the City's online planholder system. Potential bidders are responsible for ensuring contact information is registered correctly and that email updates are being received and not being sent to spam folders. It is in the best interest of potential bidders to check the website periodically to ensure all updates are received. The City is not responsible for failure of bidders to receive notifications of changes or corrections made by the City and posted as stated above.

An **required pre-bid conference** for this project will be held at the project site, located at 698 Warner Parrot Road, Oregon City, Oregon 97045 on Tuesday, October 31, 2017 at 10:00 AM to provide prospective bidders with the opportunity to view the project and ask questions relating to bidding or constructing the work under this contract. If deemed appropriate by the Engineer, questions that cannot be addressed by direct reference to the bidding documents will be the subject of an addendum issued to all plan holders. **A bidder's failure to attend the required pre-bid conference shall cause any bid submitted by that bidder to be deemed non-responsive and the bid will be returned unopened.**

No bid will be received or considered unless the bid contains a statement by the bidder, as part of their bid, that the provisions of ORS 279C.840 or 40 U.S.C. 276a shall be complied with, a statement as to resident bidder status, and whether the bidder is licensed under ORS 468A.720 (no asbestos removal is contemplated for this project). Prior to submission of its bid, the bidder shall be registered with the Oregon Construction Contractor's Board, and thereafter comply with the requirements of ORS 701.005 to 701.137.

Special minimum experience qualifications apply to this project. Approval of Contractors is a requirement for this project. Contractors submit a Request for Qualification complying in form and content to the requirements of the bid documents. Only Contractors who receive qualification by the Architect/Engineer may be named in the Proposal. Requests for Qualification shall be presented no later than November 2, 2017. The minimum qualifications and submittal requirements are specified in Section 01001 of the Contract Documents. All Requests for Qualification shall be sent directly to Laura Terway by email at lterway@orcity.org or at 221 Molalla Ave, Suite 200 the Oregon City, Oregon 97045.

Proposals submitted naming a Contractor that has not been qualified by the Architect/Engineer prior to bidding shall be considered non-responsive and shall be rejected.

Each proposal must be accompanied by a certified check, cashier's check or bid bond in an amount equal to 10 percent (10%) of the total amount bid. The successful bidder will be required to furnish a faithful performance bond and a labor and material payment bond each in the amount of one hundred percent (100%) of the amount of contract. The successful bidder will also be required to furnish a statutory bond in the amount of thirty thousand dollars (\$30,000.00). Evidence of workers' compensation insurance will be required before the work shall commence.

The City will investigate and determine the qualifications of the apparent low bidder prior to awarding the contract. The City reserves the right to reject any bid not in compliance with all prescribed public bidding procedures and requirements, and may reject all bids, if it is in the public interest to do so.

END OF SECTION

SECTION I

INSTRUCTIONS TO BIDDERS CITY OF OREGON CITY

1. Explanation to Bidders

Prior to submitting a bid, it is the responsibility of each Bidder to:

- A. Examine the contract documents thoroughly.
- B. Visit the site to become familiar with local conditions that may affect cost, progress, or performance of the work.
- C. Consider all federal, state and local laws, ordinances, rules and regulations that may affect cost, progress, or performance of the work.
- D. Study and correlate the Bidder's observations with the Contract Documents.
- E. Notify the Contact Person of all conflicts, errors, ambiguities or discrepancies discovered in the Contract Documents.

Any explanation desired by the bidders regarding the meaning or interpretation of the specifications must be requested in writing, and with sufficient time allowed for a reply to reach them before the submission of their bids.

Oral explanations or instructions given before the award of the contract will not be binding. Any interpretation will be made in the form of an addendum to the specification and will be furnished to all bidders that have received original Bid Documents and have provided accurate contact information to the City. The receipt of all addenda by the bidder shall be acknowledged in the bid submittal. The City of Oregon City will distribute Addenda to plan holders via email through its online bid center.

For more information regarding this project, please submit questions through the online plan center at <http://bids.orcity.org> or contact Laura Terway, Oregon City Community Development Director at lterway@orcity.org.

An required pre-bid conference will be held on Tuesday, October 31, 2017 at 10:00 AM at the project site. Statements made at the conference are not binding on the City unless confirmed by a written addendum.

2. Preparation of Bids

Bids shall be submitted on the form furnished, or copies thereof, and must be naturally signed. If erasures or other changes appear on the form, they shall be initialed by the person who signs the bid. No bid will be received or considered by the City unless the bid contains the Required Bid Forms as listed in **Section I, Item 12.**

3. Submission of Bids

- A. Bids shall be delivered in sealed envelopes to:
Oregon City Community Development Dept.
City of Oregon City
221 Molalla Avenue, Suite 200
Oregon City, Oregon 97045
Attention: Laura Terway, Community Development Director
- Or received at the following mailing address before the close of the bid process
Oregon City Community Development Dept.
City of Oregon City
PO Box 3040

Oregon City, Oregon 97045

Attention: Laura Terway, Community Development Director

- B. The outside of the transmittal envelope shall bear the following information:

Name of Bidder

Address

Title of Project

Date of opening

The marking "Sealed Bid"

- C. If the sealed bid is forwarded by mail or messenger service, the sealed envelope containing the bid, and marked as in B above, must be enclosed in another envelope addressed as noted in A above.

4. Bid Bond

All bids must be accompanied by a certified check, or a cashier's check upon a national or state bank, drawn and made payable to the City of Oregon City, or a bid bond from a surety company authorized to do business in the state of Oregon in an amount equal to 10% of the total proposal submitted, including all additive alternates. Failure to execute the contract and return it to the City within 8 consecutive days of execution with the required performance bond and certificates of insurance may result in forfeiture of the bid bond as fixed and liquidated damages at the discretion of the City.

When a bond is used for bid security, the bond shall be executed by a surety company authorized to transact business in the State of Oregon. THE BIDDER SHALL HAVE THE SURETY USE THE BID BOND FORM PROVIDED HEREIN. IF THIS FORM IS NOT USED, THE BID WILL BE DEEMED NON-RESPONSIVE AND SHALL BE REJECTED. Additional forms, as commonly used by the surety may be affixed to the required form.

All such certified checks or bid bonds will be returned to the respective bidders within 10 calendar days after the bids are opened, except those of the three low bidders. The certified checks or bid bonds of the three low bidders will be held by the City until the selected bidder has accomplished the following:

- A. Executed a formal contract;
- B. Executed and delivered to the City a bond in the amount of the Contract Price for the faithful performance of the contract; and
- C. Furnished the required Certificates of Insurance.

The proposal guarantees for the three low bidders will be released within 10 calendar days after the contract has been entered into and signed by the City.

5. Receipt and Opening of Bids

Bids will be submitted prior to the time fixed in the Invitation to Bid. Bids will be time and date stamped by Community Development Department personnel upon receipt. Such time and date stamps will govern the determination of on-time submission of bids.

Bids received after the time so fixed are late bids. Late bids will be time and date stamped at the time of receipt by Community Development personnel, marked as "Rejected as Late Bid" and will be returned, unopened, to the submitter.

6. Withdrawal of Bids

A Bidder may withdraw its offer by written notice submitted on the Bidder's letterhead, signed by an authorized representative of the Bidder, delivered to the City of Oregon City Community Development Dept, 221 Molalla Avenue, Suite 200, Oregon City, Oregon, and received by the City prior to closing. The Bidder or authorized representative of the Bidder may also withdraw its offer in person prior to closing, upon presentation of appropriate identification and satisfactory evidence of authority. Negligence on the

part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened. The bid will be irrevocable until such time as the City:

- A. Specifically rejects the bid, and
- B. Awards the contract to another bidder and said contract is properly executed. All bids shall remain subject to acceptance by the City for sixty (60) days after the date of the bid opening.

7. Bidders Present

At the time fixed for the opening of bids, their contents will be made public for the information of bidders and other properly interested parties who may or may not be present.

8. Award of Contract

The contract will be awarded as soon as practicable within 45 calendar days after the bid opening to the lowest responsible bidder which complies with applicable procedures and requirements, provided the bid is reasonable and it is in the best interest of the City to accept it. No contract will be awarded prior to receiving City Commission authority to do so, unless such authority has been previously granted.

9. Rejection of Bids

The City may reject any bid not in compliance with all prescribed public contracting procedures and requirements and reserves the right to reject any or all bids when such rejection is in the public interest. More than one proposal from an individual, firm or partnership, corporation or association, under the same or different names, may disqualify all such proposals submitted by that entity in Owner's sole discretion. Proposals in which prices bid for individual unit appear intentionally unbalanced so as to leave the total bid competitive, also may be disqualified.

10. Pre-Qualification of Contractors

Special minimum experience qualifications apply to portions of this project. The Contractor must be qualified by the Architect/Engineer prior to bidding. Contractors who desire to be qualified for bidding shall submit a Statement of Qualifications Form (Technical Specification Section 01001) to the Architect/Engineer on the date shown in the Invitation to Bid and on the Form.

11. Qualification of Bidders

To demonstrate qualifications to perform the work, each bidder must submit written evidence, such as financial data, previous experience, present commitments and other such data as may be called for on Section II O, QUALIFICATION OF BIDDER, form. The City will investigate and determine the qualifications for the apparent low bidder prior to awarding the contract.

12. Required Bid Forms

Each bid must contain the following items on the forms provided in Section II.

- A. The completed Bid Proposal Form.
- B. Acknowledgement that the bidder has received and reviewed all addenda for the bid.
- C. A statement that provisions of ORS 279C.840 (Prevailing Wages) shall be complied with.
- D. A statement as to whether the bidder is a resident bidder as defined in ORS 279A.120.
- E. A statement certifying that the bidder has an employee drug-testing program in place.
- F. Non-collusion affidavit.
- G. A statement as to whether or not the bidder is licensed under ORS 468.883 for asbestos removal (no asbestos removal is contemplated for this project).
- H. Certification that Contractor is properly registered.
- I. Business license information.

- J. Certification of non-discrimination.
- K. Certification of compliance with tax laws (ORS 305.385).
- L. A Bid Bond in the amount of 10 percent of the submitted bid.
- M. First-tier subcontractor disclosure form.
- N. Customer service acknowledgement form.

13. Mistakes in Bids

A. General

Clarification or withdrawal of a bid after bid opening because of an inadvertent, non judgmental mistake in the bid requires careful consideration to protect the integrity of the competitive bidding system, and to assure fairness. Except as provided in this rule, if the mistake is attributable to an error in judgment, the bid may not be corrected. Bid correction or withdrawal by reason of a non-judgmental mistake is permissible but only to the extent that it is not contrary to the interest of the City or the fair treatment of other bidders.

B. Mistakes Discovered After Bid Closing but Before Award

This subsection prescribes standards to be applied in situations where mistakes in bids are discovered after the time and date set for bid closing but before award.

- (1) Minor Informalities. Minor informalities are matters of form rather than substance that are evident from the bid documents, or insignificant mistakes that can be waived or corrected promptly without prejudice to other bidders or the City; that is, the informality does not affect price, quantity, quality, delivery, or contractual conditions except in the case of informalities involving unit price.

Examples include, but are not limited to the failure or a bidder to:

- a) Return the number of signed bids or the number of other documents required by the Bid Documents;
- b) Failure to sign the bid form in the designated block so long as a signature appears in the bid documents evidencing an intent to be bound;
- c) Acknowledge receipt of an addendum to the Bid Documents, but only if:
 - (i) it is clear from the bid that the bidder received the addendum and intended to be bound by its terms; or
 - (ii) the addendum involved had a negligible effect on price, quantity, quality, or delivery.

- (2) Mistakes Where Intended Correct Bid is Evident. If the mistake and the intended correct bid are clearly evident on the face of the bid form, or can be substantiated from accompanying documents, the City may accept the bid. Examples of mistakes that may be clearly evident on the face of the bid form are typographical errors, errors in extending unit prices, transposition errors, and mathematical errors. For discrepancies between unit prices and extended prices, unit prices shall prevail.

- (3) Mistakes Where Intended Correct Bid is Not Evident. The City will not accept a bid in which a mistake is clearly evident on the face of the bid form but the intended correct bid is not similarly evident or cannot be substantiated from accompanying documents.

14. Award of Contract

The Owner shall award the contract or reject all proposals within thirty (30) days after the bid opening. The successful bidder shall execute a contract within eight (8) calendar days from the date of written notification, and if not, the guaranteed amount shall be forfeited to the Owner. The time of completion of the work contemplated by this contract shall not be extended or changed by the lapse of time between the date the Owner received proposals and execution of the contract. In specifying the dates for completion, both parties understand that a period of not more than forty (40) consecutive days may elapse between the opening of the proposals and submission of the contract for execution. If the Owner finds that the public interest requires a delay in consideration of the bid award beyond the number of days contemplated herein, the bidder at its option may be released from its bid bond or may grant an extension

of time for the owner to consider award of the contract for his/her execution. Owner may consider an extension of time to complete the work if Contractor makes application for same to owner no later than five (5) days after Contractor knows or should know of a cause of noncompensable but excusable delay. Such causes of delay shall be deemed to be limited to labor disputes beyond the control of Contractor, acts of God, unusual and unforeseeable severe weather, or any delays caused in whole or part by either parties' non-compensable conduct. In comparing alternate bids, the Owner in its sole discretion may select a higher cost alternate if the higher alternate will better serve its interests.

15. Required Insurance

The Contractor shall carry, at a minimum, insurance as specified in Section III.

16. Required Bonds

The Contractor shall be required to provide security for payment to suppliers of labor and materials as well as for performance of the contract. Both the Performance Bond and the Payment Bond shall be in an amount equal to the full contract price. The Performance Bond is solely for the protection of the City and any other public agency(ies) for whose benefit the contract was awarded. The Payment Bond is solely for the benefit of claimants under ORS 279C.600. Both the Performance Bond and the Payment Bond shall be provided by a surety licensed to do business as a surety in the State of Oregon, shall be payable to the City and shall be in the form provided in the contract documents. Contractor shall pay the costs of any bond. The Attorney-in-Fact (Registered Agent) who executes any bond must file with each bond a notarized and effectively dated copy of his/her power of attorney. The Performance and Payment Bond shall be issued by a surety company or companies with Best's Rating of A.VII or better.

In addition and before final acceptance of the project, Contractor shall provide a maintenance and warranty bond in an amount equal to the total amount paid on the contract together with any amendments in a form approved by the Owner. Such maintenance and warranty bond shall be conditioned upon the final project being completed and guaranteed against defects in materials and workmanship. Such maintenance and warranty bond shall continue in effect during the full term of any warranty period as well as any extension of said warranty period.

17. Execution of the Contract Agreement and Bonds

The successful bidder shall obtain all necessary bonds and permits at its own initiative and expense, including those within control of Owner, except as the parties may otherwise agree in writing. The Contractor shall warranty all equipment and materials furnished and work performed by him/her for a period of one (1) year from the date of written acceptance of the project. The Contractor shall provide a performance bond in the amount of 100% of the work to be in effect for that one (1) year maintenance period. The Certificate(s) of insurance or binders shall be submitted to and approved by the Owner with the City and the Engineer named as additional insureds on an occurrence basis. Contractor's insurance carrier shall be financially responsible and registered in good standing with the Oregon Insurance Commissioner. All policies shall be kept in force until the Contractor's work is accepted by the Owner. Insurance policies (covering all operations under this Contract or if so noted for extended operations) which expire before the Contractor's work is accepted by the Owner (or where noted for extended operations, through the period of guarantee) shall be replaced or renewed immediately and evidence of same submitted to the Owner for its approval.

18. Protest Process

Any protest of Contractor selection or contract award will be processed in accordance with OAR 137-049-0450.

END OF SECTION

SECTION II A

**BID PROPOSAL AND BID SCHEDULE
CITY OF OREGON CITY**

To: City of Oregon City
Community Development
221 Molalla Avenue, Suite 200
Oregon City, Oregon 97045

From: Andy Medical Construction Co.
Bidder (Company Name)
1485 20th St SE
Address
Salem OR 97302
City, State & Zip
503-584-1416
Telephone

The undersigned bidder declares that s/he has carefully examined the Instructions to Bidders, Contract Bid Submittal requirements, Contract Agreement, Performance and Payment Bond requirements, General Requirements, Scope of Work, and Other Technical Specifications for the construction of the City of Oregon City Community Development Department; that s/he has made an examination of the site of the proposed work and has made such investigations as are necessary to determine the conditions to be encountered, and that if this proposal is accepted, s/he will contract with the City of Oregon City, Oregon, in the form similar to that attached; will provide the necessary machinery, tools, apparatus, and other means of construction and will furnish all material and labor as specified in the Contract Agreement and all other contract documents, or necessary to complete the work in the manner herein specified, and according to the requirements of the Engineer.

By signing and returning a bid, bidder acknowledges that it has read and understands the terms and conditions contained in the Invitation to Bid and that it accepts and agrees to be bound by the terms and conditions of the Invitation to Bid.

The undersigned agrees that upon written acceptance of this bid s/he will, within eight working days, of receipt of such notice, execute a formal contract agreement with the City. The undersigned further agrees that s/he will provide the following in order to execute the contract:

1. Performance Bond and Corporate Surety Payment Bond, both in the amount equal to 100% of the awarded contract;
2. Certificates of Insurance for Liability and property damage coverage;
3. Certificates of Coverage for Workman Compensation and unemployment insurance;
4. All other bonds, permits, licenses, etc. as required in the contract documents.

The undersigned hereby represents as follows:

1. That no Commissioner, officer, agency or employee of the City of Oregon City is personally interested directly or indirectly in this Contract or the compensation to be paid hereunder and that no representation, statement or statements, oral or in writing, of the City, its Commissioners, officers, agents or employees had induced him/her to enter into this Contract, and the papers made a part of its terms;
2. That this bid is made without connection with any person, firm or corporation making a bid for the same material and is, in all respects, fair and without collusion or fraud; and

3. That the provisions required by ORS 279C.840 relating to prevailing wage rates shall be included in this contract.

The undersigned agrees that, if awarded the contract, s/he will commence work within ten (10) calendar days after the date of receipt of written Notice to Proceed, that s/he will substantially complete the work within **114 consecutive calendar days** after Notice to Proceed, not to exceed March 31, 2018 and be complete and ready for final payment within **128 consecutive calendar days** after the Notice to Proceed, no later than April 13, 2018.

Bidder will complete the work in accordance with the Contract Documents and agrees to accept as full payment for the work proposed under this project, as herein specified and under the provisions included in the Bid, to be expressed in numeric figures only indicated below.

Lump Sum Bid Price for Base Bid	\$ 848,293.00
Alternate A [Add] Flagpole	\$ 6,289.00
Alternate B [Add] Plumbing Fixtures	\$ 9,712.00

Accompanying this Proposal is a bid bond, for the sum of 864,294.00, payable to the City of Oregon City, Oregon, this being an amount for ten percent (10%) of the total bid based upon the estimate of quantities at the above price according to the conditions of the advertisement. If this Proposal is accepted by the City of Oregon City and the undersigned fails to execute a satisfactory contract and bond as stated in the Advertisement within eight (8) calendar days from the date of notification, then the City may, at its option, determine that the undersigned has abandoned the contract and there upon this Proposal shall be considered null and void, and the bid security accompanying this Proposal shall be forfeited to and become the property of the City of Oregon City. If the bid is not accepted, the bid security accompanying this Proposal shall be returned to the undersigned.

BID SUBMITTAL

Dated this 17 day of November, 2017.

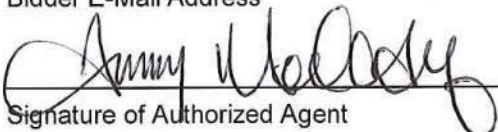
Audy Medical Construction CO.
Name of Bidder

1485 20th St. SE Salem, OR 97302
Address of Bidder

(503) 362-8842
Facsimile Number

(503) 584-1416
Telephone Number

audy@audymedicalconstruction.com
Bidder E-Mail Address


Signature of Authorized Agent

PRESIDENT
Title of Authorized Agent

47-0880237
Bidder's Taxpayer I.D. Number

198478 EXP. 12-7-2018
CCB Number: Expiration Date

Audy Medical Construction CO.
Bidder intends to provide the services of the following pre-qualified Contractor

Audy Medical Construction CO.
Contractor Business Name City of Oregon Business License # 6854
EXP 12-31-2017

(Do not leave blank. If BIDDER is an approved Contractor, enter Bidder's business name)

Audy Medical Construction CO.
City of Oregon City
Community Development Division TI
October 19, 2017

BID PROPOSAL AND BID SCHEDULE
SECTION II A - 3

SECTION II B

ADDENDA ACKNOWLEDGEMENT

I/We have received the following Addenda:

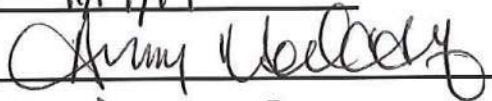
None _____

1. Addendum # 1, October 23, 2017
2. Addendum # 2, October 24, 2017
3. Addendum # 3, November 1, 2017
4. Addendum # 4, November 3, 2017
5. Addendum # 5, November 6, 2017
6. Addendum # 6, November 13, 2017

Date

11/17/17

Signature of Bidder



Title

PRESIDENT

Business Name

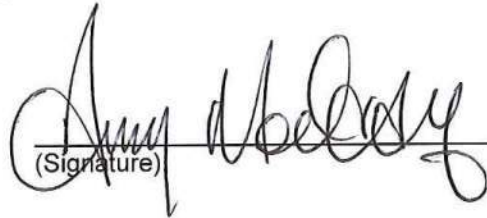
Andy Medical Construction CO.

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered irregular and may not be accepted.

RECEIPT OF THIS ADDENDUM IS ACKNOWLEDGED AND CONDITIONS ARE HEREBY AGREED TO
THIS 17 DAY OF November ²⁰¹⁷ ~~2016~~.

Avty Medical Construction Co.
Bidder's Name (Company)

BY:

(Signature) 

END OF ADDENDUM NO. 1

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered irregular and may not be accepted.

RECEIPT OF THIS ADDENDUM IS ACKNOWLEDGED AND CONDITIONS ARE HEREBY AGREED TO

THIS 17 DAY OF November 2017 2016.

Arty Medical Construction CO
Bidder's Name (Company)

BY:

[Signature]
(Signature)

END OF ADDENDUM NO. 2

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered irregular and may not be accepted.

RECEIPT OF THIS ADDENDUM IS ACKNOWLEDGED AND CONDITIONS ARE HEREBY AGREED TO

THIS 17 DAY OF November 2017 2016.

Andy Metcalf Construction Co. BY:
Bidder's Name (Company)

(Signature)

END OF ADDENDUM NO. 3

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered irregular and may not be accepted.

RECEIPT OF THIS ADDENDUM IS ACKNOWLEDGED AND CONDITIONS ARE HEREBY AGREED TO
THIS 17 DAY OF November ²⁰¹⁷ 2016.

Andy Medical Construction Co.
Bidder's Name (Company)

BY:

(Signature)

END OF ADDENDUM NO. 4

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered irregular and may not be accepted.

RECEIPT OF THIS ADDENDUM IS ACKNOWLEDGED AND CONDITIONS ARE HEREBY AGREED TO
THIS 17 DAY OF November 2017.

Andy Melnick Construction Co. BY:
Bidder's Name (Company)

(Signature)

END OF ADDENDUM NO. 5

All Bidders shall acknowledge receipt and acceptance of this Addendum No. 1 by signing in the space provided and submitting the signed Addendum with the bid. Bids submitted without this Addendum will be considered irregular and may not be accepted.

RECEIPT OF THIS ADDENDUM IS ACKNOWLEDGED AND CONDITIONS ARE HEREBY AGREED TO
THIS 17 DAY OF November ²⁰¹⁷ ~~2016~~.

Andy Medcalf Construction Co. BY:
Bidder's Name (Company)

(Signature)

END OF ADDENDUM NO. 6

SECTION II C

COMPLIANCE WITH ORS 279C.840

COMPLIANCE WITH ORS 279C.840 (PREVAILING WAGES)

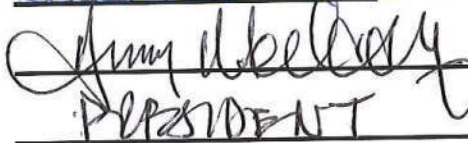
PREVAILING WAGES

By this reference, the Oregon Bureau of Labor and Industries Prevailing Wage Rates are in effect for this contract. The Contractor agrees to be bound by and will comply with the provisions of ORS 279C.840 relating to prevailing wage rates, or 40 U.S.C. 276a.

Date

November 17, 2017

Signature of Bidder



Title

PRESIDENT

Business Name

Audy Medical Construction CO.

SECTION II D

RESIDENT BIDDER STATUS (ORS 279A.120)

RESIDENT BIDDER STATUS

The undersigned represents him/herself to be a Resident or Nonresident bidder by checking the appropriate spots below. "Resident Bidder" means a bidder that has paid unemployment taxes or income taxes in Oregon during the 12 calendar months immediately preceding submission of the bid, has a business address in Oregon and has stated in the bid whether the bidder is a "Resident Bidder".

☒ Resident Bidder
Bidder

☐ Nonresident

Date

November 17 2017

Signature of Bidder

Andy Medcalf

Title

RESIDENT

Business Name

Andy Medcalf Construction Co.

SECTION II E

CERTIFICATION OF DRUG TESTING PROGRAM

DRUG TESTING PROGRAM

The undersigned confirms that this firm has an employee drug-testing program in place and will demonstrate this prior to award of contract.

Date

November 17, 2017

Signature of Bidder

Amy M. Belongy

Title

PRESIDENT

Business Name

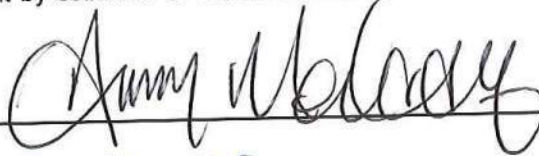
Amy Medical Construction Co.

SECTION II F

NON-COLLUSION STATEMENT

I hereby certify that the bid submitted by Audy Medcalf Const. Co is genuine and not a sham or collusive bid, or made in the interest or on behalf of any person not therein named; and I further state that we have not directly or indirectly induced or solicited any bidder or supplier on the above work to put in a sham bid, or any other person or corporation to refrain from bidding; and that we have not in any manner sought by collusion to secure to ourselves an advantage over any other bidder or bidders.

Signature of Authorized Agent



Printed Name

Audy Medcalf

Title

PRESIDENT

Company

Audy Medcalf Construction Co.

Date

November 17, 2017

SECTION II G
ASBESTOS CERTIFICATION

ASBESTOS REMOVAL

The undersigned indicates herein that s/he is or is not licensed under ORS 468A.710 for asbestos removal.

Is licensed

X

Is not licensed

Signature of Authorized Agent _____

Printed Name _____

Title _____

Company _____

Date _____

SECTION II H
REGISTRATIONS

The City will not accept a bid unless the Contractor is registered with the CCB [OAR 137-049-0200(1)(a)(K)], and the contractor or the subcontractor doing the landscaping is licensed by the State Landscape Contractors Board under ORS 701.035 - 055.

The undersigned confirms that this firm is registered with the CCB and that this firm or the subcontractor doing the landscaping is licensed by the State Landscape Contractors Board.

Date November 17, 2017

Signature of Bidder Amy Weckert

Title PRESIDENT

Contractor Name Andy Medical Construction Co.

Contractor CCB # 198478 Exp. 12-7-18

Landscaping Subcontractor GREEN ACRES

Subcontractor LCB # #7389

SECTION II I
BUSINESS LICENSES
(OCMC 05.04)

In accordance with Oregon City Municipal Code 05.04 (<http://www.orcity.org/finance/business-licenses>), no person shall carry on any business within the city without first obtaining an applicable City or Metro business license.

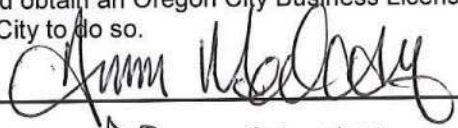
Contractor Name Audy Medical Construction Co.

Oregon City Business License No. 6854

Metro Business License No. N/A *

I CERTIFY THAT THE CONTRACTOR LISTED ABOVE (CHECK ONE):

- ☒ Is in possession of a current City of Oregon City business license.
☐ Will apply for and obtain an Oregon City Business License if awarded the contract and required by the City to do so.

Signature of Bidder 

Title PRESIDENT

*Note: A Metro business license is sufficient to perform work for the City provided the Contractor has or will be earning \$250,000 or less in gross receipts from the City of Oregon City for the fiscal year (July 1 to June 30). Contractors earning more than \$250,000 must have a City of Oregon City Business License.

2017
Expires 12/31/2017

CITY OF OREGON CITY

Incorporated 1844

Business Name: ANDY MEDCALF CONSTRUCTION COMPANY
Primary Address: 1485 20TH ST SE
SALEM, OR 97302



BUSINESS LICENSE

License # : 6854

Date Issued: : 10/24/2017

of Employees: 17

ANDY MEDCALF CONSTRUCTION COMPANY
1485 20TH ST SE
SALEM, OR 97302

Must be placed in public view

PRESERVING OUR PAST - BUILDING OUR FUTURE

SECTION II J

CERTIFICATION OF NON-DISCRIMINATION
[ORS 279A.110(A) & OAR 137-049-0440(3)]

The undersigned certifies that it has not discriminated against minority, women or emerging small business enterprises in the obtaining of subcontracts for this project and shall not discriminate against minority, women or emerging small business enterprises in awarding of subcontracts for this project.

Date November 17, 2017

Signature of Bidder Amy McElroy

Title PRESIDENT

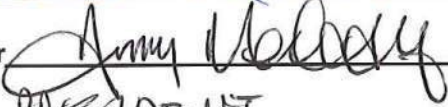
Contractor Name Amy Medical Construction CO.

SECTION II K

CERTIFICATION OF COMPLIANCE WITH TAX LAW

The undersigned certifies, under penalty of perjury, to the best of the undersigned's knowledge, it is not in violation of any tax laws, including state tax laws imposed by ORS 401.792 to 401.816 and ORS chapters 118, 314, 316, 317, 318, 320, 321 and 323; the elderly rental assistance program under ORS 310.630 to 310.706; and local taxes administered by the Department of Revenue under ORS 305.620.

Date November 17, 2017

Signature of Bidder 

Title: PRESIDENT

Contractor Name Amy Melick Construction Co.

**STATE OF OREGON
FIRST-TIER SUBCONTRACTOR DISCLOSURE FORM**

This form must be submitted at the location specified in the Invitation to Bid within two (2) working hours after the date and time of the deadline when the bids are due.

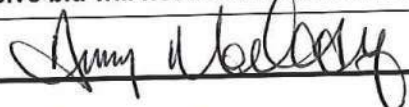
List below the name of each subcontractor that will be furnishing labor or labor and materials and that is required to be disclosed by ORS 279C.370, the dollar value of the subcontract and the category of work that the subcontractor will be performing.

Enter "**NONE**" if there are no subcontractors that need to be disclosed.
(ATTACH ADDITIONAL SHEETS IF NEEDED)

Project Name: CITY OF OREGON CITY COMMUNITY DEVELOPMENT TI

Bid Number: NA **Bid Closing - Date:** November 17, 2017 **Time:** 3:30 PM

SUBCONTRACTOR NAME (Please Print)	DOLLAR VALUE	CATEGORY/DIVISION OF WORK (Painting, electrical, landscaping, etc.)
Name <u>AC & E</u>	\$ <u>126,400.⁰⁰</u>	<u>Electrical</u>
Name <u>2 Street Medical</u> <u>Davis Heating</u>	\$ <u>197,773.⁰⁰</u>	<u>HVAC</u>
Name	\$	
Name	\$	
Name	\$	
Name	\$	
Name	\$	
Name	\$	
Name	\$	
Name	\$	
Name	\$	
Failure to submit this form by 4:00 p.m. on the day of the bid opening will result in a non-responsive bid. A non-responsive bid will not be considered for award.		

Form submitted by (Bidder's Name): 

Contact Name: Andy Medcalf **Phone No.:** 503-910-7852

SECTION II M

BID BOND

Know all persons by these presents, that Andy Medcalf Construction Co. hereinafter called the
PRINCIPAL, and Developers Surety and Indemnity Company a corporation or partnership duly
organized under the laws of the State of California, having its principal
place of business at 17771 Cowan, Irvine, CA, and authorized to do business in the State
of Oregon as SURETY, are held and firmly bound unto the City of Oregon City, hereinafter called the
OBLIGEE in the penal sum of Ten Percent (10%) of Bid Amount Dollars (\$ 10% of Bid Amount) for the
payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators,
successors and assigns, jointly and severally, firmly by these presents.

The condition of this bond is such that, whereas, the PRINCIPAL herein is herewith submitting
his/her or its Bid Proposal for the City of Oregon City Community Development T1, said Bid
Proposal, by reference thereto, being hereby made a part hereof.

Now, therefore, if the said Bid Proposal, submitted by the said PRINCIPAL, is accepted, the Contract
awarded to the PRINCIPAL, and if the said PRINCIPAL shall execute the proposed contract and shall
furnish such Performance and Payment Bond as required by the Bidding and Contract documents
within the time fixed by the Documents, then this obligation shall be void.

If the PRINCIPAL shall fail to execute the proposed Contract and to furnish the Performance and
Payment Bond, the SURETY hereby agrees to pay the OBLIGEE the penal sum as liquidated
damages.

Signed and sealed this 17th Day of November, 2017.

Andy Medcalf Construction Co.

Principal

By:

Andy Medcalf PRESIDENT

Developers Surety and Indemnity Company

Counter Signed:

n/a

Resident Agent

Tamara A. Ringeisen

Attorney-in-Fact

A certified copy of the Agent's Power of Attorney must be attached hereto.

City of Oregon City
Community Development Division T1
October 19, 2017

BID BOND

SECTION II M - 1

**POWER OF ATTORNEY FOR
DEVELOPERS SURETY AND INDEMNITY COMPANY
INDEMNITY COMPANY OF CALIFORNIA
PO Box 19725, IRVINE, CA 92623 (949) 263-3300**

KNOW ALL BY THESE PRESENTS that except as expressly limited, DEVELOPERS SURETY AND INDEMNITY COMPANY and INDEMNITY COMPANY OF CALIFORNIA, do each hereby make, constitute and appoint:

Christopher Kinyon, Julie R. Truitt, Karen C. Swanson, Sara Sophie Sellin, Aliceon A. Keltner, Jamie Diemer, Carley Espiritu, Misti M. Webb, Michael S. Mansfield, David W. Ross, Tamara A. Ringeisen, James Roy Cox, Linda Diane Shaddon, Dana Marie Brinkley, Annelies M. Richie, Cynthia L. Jay, Kyle Joseph Howat, jointly or severally

as their true and lawful Attorney(s)-in-Fact, to make, execute, deliver and acknowledge, for and on behalf of said corporations, as sureties, bonds, undertakings and contracts of suretyship giving and granting unto said Attorney(s)-in-Fact full power and authority to do and to perform every act necessary, requisite or proper to be done in connection therewith as each of said corporations could do, but reserving to each of said corporations full power of substitution and revocation, and all of the acts of said Attorney(s)-in-Fact, pursuant to these presents, are hereby ratified and confirmed.

This Power of Attorney is granted and is signed by facsimile under and by authority of the following resolutions adopted by the respective Boards of Directors of DEVELOPERS SURETY AND INDEMNITY COMPANY and INDEMNITY COMPANY OF CALIFORNIA, effective as of January 1st, 2008.

RESOLVED, that a combination of any two of the Chairman of the Board, the President, Executive Vice-President, Senior Vice-President or any Vice President of the corporations be, and that each of them hereby is, authorized to execute this Power of Attorney, qualifying the attorney(s) named in the Power of Attorney to execute, on behalf of the corporations, bonds, undertakings and contracts of suretyship; and that the Secretary or any Assistant Secretary of either of the corporations be, and each of them hereby is, authorized to attest the execution of any such Power of Attorney;

RESOLVED, FURTHER, that the signatures of such officers may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures shall be valid and binding upon the corporations when so affixed and in the future with respect to any bond, undertaking or contract of suretyship to which it is attached.

IN WITNESS WHEREOF, DEVELOPERS SURETY AND INDEMNITY COMPANY and INDEMNITY COMPANY OF CALIFORNIA have severally caused these presents to be signed by their respective officers and attested by their respective Secretary or Assistant Secretary this 6th day of February, 2017.

By: Daniel Young
Daniel Young, Senior Vice-President

By: Mark Lansdon
Mark Lansdon, Vice-President



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Orange

On February 6, 2017 before me, _____
Date

Lucille Raymond, Notary Public
Here Insert Name and Title of the Officer

personally appeared Daniel Young and Mark Lansdon
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature Lucille Raymond
Lucille Raymond, Notary Public



Place Notary Seal Above

CERTIFICATE

The undersigned, as Secretary or Assistant Secretary of DEVELOPERS SURETY AND INDEMNITY COMPANY or INDEMNITY COMPANY OF CALIFORNIA, does hereby certify that the foregoing Power of Attorney remains in full force and has not been revoked and, furthermore, that the provisions of the resolutions of the respective Boards of Directors of said corporations set forth in the Power of Attorney are in force as of the date of this Certificate.

This Certificate is executed in the City of Irvine, California, this 17th day of February 2017

By: Cassie J. Bernisford
Cassie J. Bernisford, Assistant Secretary



SECTION II N

CUSTOMER SERVICE ACKNOWLEDGMENT FORM

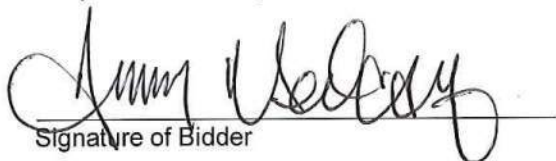
Project Name:

Bid Closing: Date: November 17, 2017 Time: 3:30 PM

Note: This form is part of the inquiry concerning bidder responsibility and must be submitted with the other proposal forms as specified in Section I, Instructions to Bidders.

Bidder, by his/her signature below, hereby signifies that s/he has read and understands the construction specifications.

Bidder further acknowledges that s/he understands their terms, fully acknowledges their importance to successful completion of the project, and agrees to be bound thereby if awarded this contract. Bidder further assures the City that, if awarded this contract, s/he will promptly, efficiently and courteously carry out his/her responsibilities under the aforementioned specifications.


Signature of Bidder

PRESIDENT
Title

Audy Medical Construction Co.
Name of Firm

November 17, 2017
Date

SECTION III B
**OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS**

1. Time of Completion. The City and the Contractor recognize that time is of the essence in this agreement, and the City may sustain damages if work is not completed within the contract time limit as stated or as adjusted during the life of the contract. It is agreed that the Contractor shall pay the City, as liquidated damages, but not as a penalty, the per diem amount listed in the Schedule of Liquidated Damages, as set forth in the contract documents, for each and every day elapsed in excess of the final contract time.

Permitting the Contractor to finish the work after the contract time has expired shall not be a waiver of any of the City's contract rights.

2. Payments, Statement of Compliance and Subcontractor Payments.

a. Contract Sum and City Payments. The City shall pay to the Contractor, for the performance of this agreement, the amounts determined for the total supplied number of each of the specified units of work in the Schedule of Bid Items contained in the contract documents. The number of units contained in this schedule is understood to be approximate only, and that any item may be expanded, contracted, or eliminated by procedures contained in the contract documents.

b. Statement of Compliance. Before any payment is made to the Contractor, the Contractor shall file with the City a statement, under oath, that it has complied with all provisions of state law governing contractors on a public contract. In addition, the Contractor shall file with the City a sworn statement by each of its subcontractors to the same effect.

c. Progress Payments and Retainage. Partial payments may be made by the City on a monthly basis. Partial payments will be based on an estimate of the percentage of completion for the work. Progress payments shall not be considered an acceptance or approval of any of the work or a waiver of any defects therein. The City may reserve, as retainage from progress payments, an amount not to exceed five percent

of the payment. The Contractor shall have the right to have cash retainage deposited in an interest bearing account, in accordance with ORS 279C.550. The City does not accept deposit bonds or securities in lieu of cash retainage.

d. Certified Payroll Statements.

The Contractor shall file certified payroll statements with the City at a minimum of once per month. Failure to do so shall result in the City withholding 25% of amounts due the Contractor, in addition to any other required retainage.

e. Final Payment.

The final payment shall be made for the actual number of units that are incorporated in or made necessary by the work covered by this agreement. Not more than 30 days after final completion of the Work and the City's final acceptance of the work, which shall include the taking of final measurements of quantities, the City shall make its final payment to the Contractor. Retainage held by the City shall be included in, and paid to the Contractor, as part of the final payment. If the final payment is made more than 30 days after final completion and final acceptance, the City shall pay the Contractor interest at the rate of one and one half (1 - 1/2%) per month on the final payment, commencing 30 days after completion of the work by the Contractor and final acceptance of the Work by the City. To facilitate the City's inspection, the Contractor shall notify the City in writing when the Contractor considers the work complete.

f. Subcontractor Payments.

The Contractor shall pay the subcontractor for satisfactory performance under the subcontract, out of amounts that are paid by the City to the Contractor, within 10 days of the Contractor's receipt of such payments from the City.

If the Contractor, or a first tier subcontractor, fails to make timely payment to the subcontractor then the Contractor or first tier subcontractor shall owe the person the amount

SECTION III B
**OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS**

due plus an interest penalty beginning on the day after the required payment date and ending on the date on which payment is made, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest charged to the Contractor or first tier subcontractor on the amount due shall equal three times the discount rate on 90 day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve District that includes Oregon on the date that is 30 days after the date when the payment was received from the Contractor, a first tier subcontractor or City, but the rate of interest shall not exceed thirty percent (30%). The amount of interest may not be waived.

The subcontractor must provide in all contracts with lower tier subcontractors or suppliers a clause requiring that the subcontractor shall pay the lower tier subcontractors and suppliers in accordance with the provisions of the immediately preceding two paragraphs above.

Pursuant to ORS 279C.515(C), if the Contractor or a subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with this Contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.

If the Contractor fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the Contractor or a subcontractor by any person in connection with the public contract as the claim becomes due, the proper officer or officers representing the City, may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to become due the Contractor by reason of the contract.

First tier subcontractors shall file certified payroll statements with the Contractor. Failure to do so shall result in the Contractor withholding 25% of amounts due the first tier subcontractor.

3. Insurance, Indemnity, Termination.

a. Insurance.

The Contractor shall maintain in force for the duration of this contract the insurance coverages specified below. Each policy required by these provisions shall be written as a primary policy, not contributing with or in excess of any coverage, which the City may carry. A copy of each policy or a certificate satisfactory to the City shall be delivered to the City prior to commencement of work.

Unless otherwise specified, each policy shall be written on an "occurrence" form with an admitted insurance carrier licensed to do business in the State of Oregon. Each policy shall contain an endorsement entitling the City to not less than 30 days prior written notice of any material change, nonrenewal or cancellation.

In the event statutory limits of liability of a public body for claims arising out of a single accident or occurrence is increased above the combined single limit coverage requirements specified below, the City shall have the right to require the Contractor to increase the Contractor's coverages to the statutory limit for such claims, and to increase the aggregate coverage to twice the amount of the statutory limit.

The adequacy of all insurance required by these provisions shall be subject to approval by the City. Failure to maintain any insurance coverage required by this contract shall be cause for immediate termination by the City.

i) Comprehensive General Liability.

The Contractor shall maintain a broad form comprehensive general liability insurance policy with coverage of not less than \$2,000,000 combined single limit per occurrence, with aggregate of \$3,000,000. Coverage shall be for bodily injury, personal injury or property damage. Such policy shall contain a contractual liability endorsement to cover the Contractor's indemnification obligations under this contract.

SECTION III B
**OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS**

The policy shall also contain an endorsement naming the City, its officers, agents and employees as additional insureds, in a form satisfactory to the City, and expressly providing that the interest of the City shall not be affected by the Contractor's breach of policy provisions.

ii) Comprehensive Automobile Liability.

The Contractor shall maintain a comprehensive automobile liability insurance policy with coverage of not less than \$500,000 combined single limit per occurrence, with aggregate of \$1,000,000 for bodily injury, personal injury or property damage. The coverage shall include both hired and non-owned auto liability. The policy shall also contain an endorsement naming the City, its officers, agents and employees as additional insureds, in a form satisfactory to the City, and expressly providing that the interest of the City shall not be affected by the Contractor's breach of policy provisions.

iii) Workers' Compensation Insurance The Contractor shall comply with the Oregon Workers' Compensation law by qualifying as a carrier insured employer or as a self-insured employer and shall strictly comply with all other applicable provisions of such law. The Contractor shall provide the City with such further assurances as the City may require from time to time that the Contractor is in compliance with these Workers' Compensation coverage requirements and the Workers' Compensation law.

b. Indemnification.

The Contractor shall indemnify and hold the City, and its officers, agents and employees, harmless from and against all claims, actions, liabilities, costs (including attorney fees) and other costs of defense, arising out of or in any way related to the Work, the Contractor's failure to comply strictly with any provision of this contract, or any other actions or failure to act by the Contractor and the Contractor's employees, agents, officers, representatives and subcontractors.

In the event any such action or claim is brought against the City, the Contractor shall, if the City so elects and upon tender by the City, defend the same at the Contractor's sole cost and expense, promptly satisfy any judgment adverse to the City or to the City and the Contractor jointly, and reimburse the City for any loss, cost, damage, or expense, including attorney fees, suffered or incurred by the City.

c. Termination and Suspension.

The City may terminate this contract or suspend the work at any time for any reason considered by the City, in the exercise of its sole discretion, to be in the public interest.

In the event the Work's suspension is not the result of a labor dispute and this contract is not terminated, the Contractor shall be entitled to a reasonable extension of the time for completion, to be determined by the City, and shall be compensated for all actual verified costs incurred as a result of the suspension, plus the Contractor's standard overhead with respect to such costs.

In the event of a termination of this contract under these provisions, the Contractor shall be compensated for any preparatory work and actual, verified costs and expenses incurred as a result of the termination. In addition the Contractor shall be compensated for the Work performed on the basis of the Contract Sum in the case of any fully completed separate item or portion of the Work for which there is a separate or unit price, and with respect to any other portion of the Work shall be paid a percentage of the Contract Sum allocated to such other Work equal to the percentage of Work completed to the date of termination.

None of the foregoing provisions concerning compensation in the event of a suspension of Work or termination of this contract shall apply if such suspension or termination occurs as a result of the Contractor's violation of any Federal, State, or Local statutes, ordinances, rules or regulations, or as a result of any violation by the Contractor of the terms of this

SECTION III B
OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS

contract, including a determination by the City that the Contractor has not progressed satisfactorily with the Work in accordance with specifications.

4. Liquidated Damages.

Unless provided elsewhere in the Contract documents, liquidated damages in the amount of \$250.00 per calendar day shall apply for every day after the completion time limit that the project is not Substantially Complete.

Permitting the Contractor to continue and finish the work after the contract time or adjusted contract time has expired shall not be a waiver of any of the City's contract rights.

Payment of liquidated damages shall not release the Contractor from any obligations to complete the work nor constitute a waiver of the City's right to collect any additional damages that the City may sustain by failure of the Contractor to fulfill the contract. Liquidated damages shall be full and complete payment only for failure of the Contractor to complete the work on time. The amount of liquidated damages accrued may be deducted from payments due or to become due to the Contractor.

5. Work Schedule.

The Contractor shall notify the Community Development Director a minimum of 48 hours prior to commencing work. The Contractor shall perform all work in an expeditious manner, minimizing delays and inconvenience to local businesses and/or residents.

6. Existing Utilities

The Contractor shall be responsible for checking actual utility locations in the field and checking with appropriate agencies that may have underground facilities within the project limits. The Contractor shall notify utility companies at least 2 business days, but not more than 10 business days before commencing any excavations. The excavator shall notify a utilities notifications system of the date, location, and depth of the proposed excavation and the type of work to be performed. Notifying

a utilities notification system constitutes notice only to the participating members of that service. If no utilities notification system is available, or if the owner of the underground facilities is not a member of a utilities notification system, the excavator shall give the same notice to each owner of underground facilities who is known to the excavator or who can be identified and contacted by the excavator.

7. Materials.

All materials shall be as specified in the Technical Specifications, plans, noted or other technical descriptions included herewith, unless otherwise noted. The City reserves the right to sample and test all material according to specification requirements cited in this contract.

8. Traffic Control.

Maintenance of traffic and traffic control through the work area shall be the responsibility of Contractor. If Contractor fails at any time during the project to provide adequate access for local traffic, the City may, at the discretion of the Community Development Director, and giving the Contractor four (4) hours notice, perform the necessary work to restore traffic and deduct the cost of such work from the contract price. The provisions for traffic control shall perform the necessary work to restore traffic and deduct the costs of such work from the contract price. The following provisions shall be made for traffic control:

- a. All work done under this contract in the City's right of way shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways, as currently modified by the Oregon Department of Transportation.
- b. The Contractor shall insure that during non-work hours, that on-call staff is available to maintain all traffic control devices for the project. Both the Community Development Director and the Chief of Police will be provided up to date contact information on these people. Failure to comply with this provision will cause the Contractor to be billed for any services

SECTION III B
**OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS**

required to be provided by City forces to provide adequate protection to the traveling public during non-work hours.

- c. Traffic control and temporary protective and directional devices may be used outside the limits of the project when they have direct bearing on the work under contract.
- d. The Contractor shall consider at least the following factors in restricting traffic flow (consistent with notes above):
 - i) Emergency vehicle access.
 - ii) Sufficiency of traffic control personnel and devices.
 - iii) Prior warning to the public and residents.
 - iv) Notification to TriMet, School District, Post Office, garbage company, and City/County emergency dispatch agencies.
- e. At the pre-construction conference, the Contractor shall provide the name, address and telephone number of the individual responsible for project and construction traffic controls during non-working hours.
- f. The Contractor shall not interrupt access to any private driveway for more than three consecutive hours unless written permission has been given to the Contractor by the owner of the property affected. Advance notice of forty-eight hours shall be given by the Contractor to the affected landowners and residents.

9. Contractor's Use of Premises.

The Contractor shall exercise care to protect adjacent existing structures and property from damage. All debris and excess materials shall be removed and disposed at the direction of the Community Development Director.

10. Control of Work.

All work done under this contract shall not be deemed complete until accepted by Community Development Director. The Community Development Director shall decide any and all questions that may arise as to the quality and/or acceptability of the materials used and/or work performed. Final approval and acceptance of any and all work performed under this contract shall be the responsibility of the Community Development Director.

11. Contractor's Responsibility.

It is understood that the plans, specifications and other contract documents do not purport to control the method of preparing the work, but only the requirements as to the nature of the completed work. The Contractor assumes the entire responsibility for the method of performing and installing the work. Suggestions as to the method of performing and installing the work included in the contract documents shall be deemed advisory only and the feasibility of such methods, or the lack thereof, shall not affect the Contractor's liability or status as an independent Contractor under this contract.

12. Plans and Specifications

If there is a conflict between contract documents, the document highest in precedence shall control. The precedence shall be:

First:	Permits as may be required by law
Second:	Contract Agreement
Third:	Bidder's Proposal
Fourth:	Technical Provisions (Technical Specifications and Drawings)
Fifth:	General Requirements,
General	Conditions, and Supplementary Conditions

Change orders, supplemental agreements and approved revisions to plans and specifications will take precedence over documents listed above. Detailed plans shall have precedence over general plans as modified by the General Requirements and Technical Provisions applicable to this Project.

SECTION III B
**OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS**

13. Control of Work.

It will be the direct responsibility of the Contractor to furnish every subcontractor a complete set of project plans and insure that these plans are on the project site and in use when the subcontractor is performing that portion of the project.

The Contractor shall be responsible for any process control sampling, testing, measurement, and inspection needed to insure that the finished work complies with specifications. When density testing is required for assurance and/or acceptance testing, the Contractor shall furnish and operate the nuclear gauge or shall retain an independent testing firm to perform the compaction testing. The testing shall be conducted under the observation of the engineer and performed on all surfaces regardless of density requirements unless otherwise directed by the engineer. All test results shall be provided in written report form to the engineer.

The Contractor shall give the attention necessary to keep the work progressing at a rate satisfactory to the engineer. The Contractor shall provide, at all times, a competent superintendent for all work on the project. The superintendent shall be readily accessible on a daily basis, have a set of plans, specifications, special provisions, and addenda, and be experienced in the type of work being performed. The superintendent shall have the authority to receive and carry out, without delay, the engineer's instructions and orders and to make arrangements for necessary materials, equipment, and labor.

The Contractor shall allow the engineer access at all times, during normal office hours, to books and records of the Contractor and the Contractor's subcontractors that pertain to the contract, and furnish the engineer facts necessary to determine actual cost of any part of all of the work. The engineer will consider a request for confidentiality to protect trade secrets.

If the engineer is not provided proper facilities by the Contractor for keeping strict accounting of cost, then the Contractor agrees to waive any claim for extra compensation.

Contractor shall schedule work Monday through Friday only. Contractor shall establish a standard daily work schedule for hours to begin and end work that is acceptable to the City.

Contractor shall not trespass on private property nor shall they use business or residential garden hoses or water faucets without the written approval of the property owner(s).

14. Protection of City Property.

It is the Contractor's responsibility to protect sidewalks, asphalt paving, concrete, trees, shrubs, and any lawn areas at all times from work related damage of any type. Costs for cleaning, restoration or repair shall be borne by the Contractor, as the City may deem appropriate.

Should, during the course of Contractor's work, Contractor observe or suspect the presence of asbestos fiber, Contractor shall immediately stop work and notify the City of its findings. Should the project's schedule be delayed because of such findings, the Contractor will remove itself from the project and wait the City's order to return to work, at no penalty to the City.

Debris shall not be permitted to remain on site and shall be disposed daily and/or as directed by City.

It is the Contractor's responsibility to manage a safe work environment and Contractor shall take any means necessary to secure a safe work site for both the safety of all personnel and the public.

15. Contractor Identification.

Contractor shall furnish to City its taxpayer identification number as designated by the IRS.

SECTION III B
OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS

16. Assignment.

Contractor shall not assign any rights acquired hereunder, without obtaining prior written approval from City.

17. Access to Records.

City shall have access to all books, documents, papers and records of Contractor that are pertinent to this Agreement for the purpose of making audits, examinations, excerpts and transcripts.

18. Ownership of Work Product; License.

All work products of Contractor that result from this Agreement (the "Work Products") are the exclusive property of City. In addition, if any of the Work Products contain intellectual property of Contractor that is or could be protected by federal copyright, patent, or trademark laws, or state trade secret laws, Contractor hereby grants City a perpetual, royalty-free, fully paid, nonexclusive and irrevocable license to copy, reproduce, deliver, publish, perform, dispose of, use and re-use, in whole or in part (and to authorize others to do so), all such Work Products and any other information, designs, plans, or works provided or delivered to City or produced by Contractor under this Agreement. The parties expressly agree that all works produced pursuant to this Agreement are works specially commissioned by City, and that any and all such works shall be works made for hire in which all rights and copyrights belong exclusively to City. Contractor shall not publish, republish, display or otherwise use Work Products resulting from this Agreement without the prior written agreement of City.

19. Legal Expenses.

In the event legal action is brought by City or Contractor against the other to enforce any of the obligations hereunder or arising out of any dispute concerning the terms and conditions hereby created, the losing party shall pay the prevailing party such reasonable amounts for attorney fees, costs, and expenses as may be set by a court. "Legal action" shall include matters subject to arbitration and appeals.

20. Severability.

The parties agree that, if any term or provision of this Agreement is declared by a court to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected.

21. Number and Gender.

In this Agreement, the masculine, feminine or neuter gender, and the singular or plural number, shall be deemed to include the others or other whenever the context so requires.

22. Captions and Headings.

The captions and headings of this Agreement are for convenience only and shall not be construed or referred to in resolving questions of interpretation or construction.

23. Calculation of Time.

All periods of time referred to herein shall include Saturdays, Sundays and legal holidays in the state of Oregon, except that, if the last day of any period falls on any Saturday, Sunday or legal holiday, the period shall be extended to include the next day that is not a Saturday, Sunday or legal holiday.

24. Notices.

Any notices, bills, invoices, reports or other documents required by this Agreement shall be sent by the parties by United States mail, postage prepaid, or personally delivered to the addresses listed in the Agreement attached hereto. All notices shall be in writing and shall be effective when delivered. If mailed, notices shall be deemed effective forty-eight (48) hours after mailing, unless sooner received.

25. Nonwaiver.

The failure of City to insist upon or enforce strict performance by Contractor of any of the terms of this Agreement or to exercise any rights hereunder shall not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights of any future occasion.

SECTION III B
**OREGON CITY PUBLIC IMPROVEMENT
STANDARD CONDITIONS**

26. Information and Reports.

Contractor shall, at such time and in such form as City may require, furnish such periodic reports concerning the status of the project, such statements, certificates, approvals, and copies of proposed and executed plans and claims, and other information relative to the project as may be requested by City. Contractor shall furnish City, upon request, with copies of all documents and other materials prepared or developed in relation with or as a part of the project. Working

papers prepared in conjunction with the project are the property of City, but may remain with Contractor. Copies as requested shall be provided free of cost to City.

27. Governing Law. This Agreement shall be governed and construed in accordance with the laws of the state of Oregon without resort to any jurisdiction's conflicts of law, rules or doctrines.

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SECTION III C
STATUTORY CONDITIONS To
CONTRACT AGREEMENT

ORS 279C.505(1)(a) CONTRACTOR shall make payment promptly, as due, to all persons supplying to such CONTRACTOR labor or material for the prosecution of the work provided for in such contract.

ORS 279C.505(1)(b) CONTRACTOR shall pay all contributions or amounts due the Industrial Accident Fund from such CONTRACTOR or subcontractor incurred in the performance of the contract.

ORS 279C.505(1)(c) CONTRACTOR shall not permit any lien or claim to be filed or prosecuted against the state, county, school district, municipality, municipal corporation or subdivision thereof, on account of any labor or material furnished.

ORS 279C.505(1)(d) CONTRACTOR shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

ORS 279C.505(2) CONTRACTOR shall demonstrate that an employee drug testing program is in place.

ORS 279C.510 CONTRACTOR shall salvage or recycle construction and demolition debris, if feasible and cost-effective. In a public improvement contract for lawn and landscape maintenance, CONTRACTOR shall compost or mulch yard waste material at an approved site, if feasible and cost-effective.

ORS 279C.515(1) If the CONTRACTOR fails, neglects or refuses to make prompt payment of any claim for labor or services furnished to the CONTRACTOR or a subcontractor by any person in connection with the public contract as the claim becomes due, the proper officer or officers representing the state or a county, school district, municipality, municipal corporation or subdivision thereof, as the case may be, may pay such claim to the person furnishing the labor or services and charge the amount of the payment against funds due or to

become due the CONTRACTOR by reason of the contract.

ORS 279C.515(2) If the CONTRACTOR or a first-tier subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public improvement contract within 30 days after receipt of payment from the contracting agency or a contractor, the CONTRACTOR or first-tier subcontractor shall owe the person the amount due plus interest charges commencing at the end of the 10-day period that payment is due under ORS 279C.580 (4) and ending upon final payment, unless payment is subject to a good faith dispute as defined in ORS 279C.580. The rate of interest charged to the contractor or first-tier subcontractor on the amount due shall equal three times the discount rate on 90-day commercial paper in effect at the Federal Reserve Bank in the Federal Reserve district that includes Oregon on the date that is 30 days after the date when payment was received from the contracting agency or from the CONTRACTOR, but the rate of interest may not exceed 30 percent. The amount of interest may not be waived.

ORS 279C.515(3) If the CONTRACTOR or a subcontractor fails, neglects or refuses to make payment to a person furnishing labor or materials in connection with the public improvement contract, the person may file a complaint with the Construction Contractors Board, unless payment is subject to a good faith dispute as defined in ORS 279C.580.

ORS 279C.520

(1) A person may not be employed for more than 10 hours in any one day, or 40 hours in any one week, except in cases of necessity, emergency or when the public policy absolutely requires it, and in such cases, the employee shall be paid at least time and a half pay:

(a)(A) For all overtime in excess of eight hours in any one day or 40 hours in any one week when the work week is five consecutive days, Monday through Friday; or

SECTION III C
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(B) For all overtime in excess of 10 hours in any one day or 40 hours in any one week when the work week is four consecutive days, Monday through Friday; and

(b) For all work performed on Saturday and on any legal holiday specified in ORS 279C.540.

(2) An employer must give notice in writing to employees who work on a public contract, either at the time of hire or before commencement of work on the contract, or by posting a notice in a location frequented by employees, of the number of hours per day and days per week that the employees may be required to work.

ORS 279C.525 In addition to any other laws, rules and regulations dealing with the prevention of environmental pollution and the preservation of natural resources he following environmental and natural resources, laws, rules and regulations affect the performance of the contract:

- City of Oregon City Erosion Control Ordinance (Ref. Oregon City Municipal Code Chapter 17.47 Erosion and Sediment Control).

ORS 279C.530 The CONTRACTOR shall promptly, as due, make payment to any person, copartnership, association or corporation, furnishing medical, surgical and hospital care, or other needed care and attention, incident to sickness or injury, to the employees of the CONTRACTOR, of all sums which the CONTRACTOR agrees to pay for such services and all moneys and sums which the CONTRACTOR collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

ORS 279C.530(2) All employers, including CONTRACTOR, that employ subject workers who work under this Contract in the State of Oregon shall comply with ORS 656.017 and provide the required Workers' Compensation coverage, unless such employers are exempt under ORS 656.126. CONTRACTOR shall

ensure that each of its subcontractors complies with these requirements.

ORS 279C.545 Any worker employed by the CONTRACTOR shall be foreclosed from the right to collect for any overtime provided in ORS 279C.540 unless a claim for payment is filed with the CONTRACTOR within 90 days from the completion of the contract, providing the CONTRACTOR has caused a circular clearly printed in boldfaced 12-point type and containing a copy of this section to be posted in a prominent place alongside the door of the timekeeper's office or in a similar place that is readily available and freely visible to workers employed on the work and maintained the circular continuously posted from the inception to the completion of the contract on which workers are or have been employed.

ORS 279C.550 - 570 Retainage and payment under the terms of this Agreement shall be governed by the terms of ORS 279C.550 – 570.

ORS 279C.570 The CITY shall make progress payments on the contract monthly as work progresses on the contract. Payments shall be based upon estimates of work completed that are approved by the CITY. A progress payment is not considered acceptance or approval of any work or waiver of any defects therein. The CITY shall pay to the CONTRACTOR interest on the progress payment, not including retainage, due the CONTRACTOR.

ORS 279C.580(3) CONTRACTOR shall pay the first-tier subcontractor for satisfactory performance under the subcontract out of amounts that are paid by the CITY to the CONTRACTOR within 10 days of CONTRACTOR's receipt of such payments from the CITY. If payment is not made within 30 days after receipt of payment from the contracting agency, the CONTRACTOR shall pay to the first-tier subcontractor an interest penalty as provided in ORS 279C.580(C). The CONTRACTOR shall include this requirement as further detailed in the Special Provisions in all subcontracts worded appropriately to require

SECTION III C
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prompt payment of said subcontractors to lower tier subcontractors.

ORS 279C.605 A notice of claim required by ORS 279C.600 must be sent by registered or certified mail or hand delivered no later than 120 days after the day the person last provided labor or furnished materials or 120 days after the worker listed in the notice of claim by the Commissioner of the Bureau of Labor and Industries last provided labor. The notice may be sent or delivered to the CONTRACTOR at any place the CONTRACTOR maintains an office or conducts business or at the residence of the CONTRACTOR. Notwithstanding the preceding, if the claim is for a required contribution to a fund of an employee benefit plan, the notice required by ORS 279C.600 must be sent or delivered within 200 days after the employee last provided labor or materials.

ORS 279C.825 A fee established by administrative order, is required to be paid to the Commissioner of the Bureau of Labor and Industries at the time the City notifies the commissioner under ORS 279C.835 that a contract subject to the provisions of ORS 279C.800 to 279C.870 has been awarded.

ORS 279C.830(1) The existing prevailing rate of wage and, if applicable, the federal prevailing rate of wage required under the Davis-Bacon Act (40 U.S.C. 3141 et seq.) that may be paid to workers in each trade or occupation required for the public works employed in the performance of the contract either by the CONTRACTOR or subcontractor or other person doing or contracting to do the whole or any part of the work contemplated by the contract is included in Section IX of these contract documents. The workers shall be paid not less than the specified minimum hourly rate of wage.

ORS 279C.830(2) The CONTRACTOR and every subcontractor must have a public works bond filed with the Construction Contractors Board before starting work on the project, unless exempt. CONTRACTOR shall:

(a) Have a public works bond filed with the Construction Contractors Board before starting work on the project, unless exempt.

(b) Include in every subcontract a provision requiring the subcontractor to have a public works bond filed with the Construction Contractors Board before starting work on the project, unless exempt.

ORS 279C.845(7) If CONTRACTOR is required to file certified statements, the public agency **shall** retain 25 percent of any amount earned by the CONTRACTOR on the public works until the CONTRACTOR has filed with the public agency certified statements as required by this section. The public agency shall pay the CONTRACTOR the amount retained under this subsection within 14 days after the CONTRACTOR files the certified statements as required by this section, regardless of whether a subcontractor has failed to file certified statements as required by this section.

ORS 279C.845(8) CONTRACTOR shall retain 25 percent of any amount earned by a first-tier subcontractor on a public works until the subcontractor has filed with the public agency certified statements as required by this section. CONTRACTOR shall verify that the first-tier subcontractor has filed the certified statements before the CONTRACTOR may pay the subcontractor any amount retained under this subsection. CONTRACTOR shall pay the first-tier subcontractor the amount retained under this subsection within 14 days after the subcontractor files the certified statements as required by this section.

ORS 305.385(6) CONTRACTOR shall certify in writing, under penalty of perjury, that CONTRACTOR is, to the best of the person's knowledge, not in violation of any tax laws described in ORS 305.380 (4).

ORS Chapter 701 CONTRACTOR shall certify that all subcontractors performing work described in ORS 701.005(2), i.e., construction work, will be registered with the Construction Contractors Board or licensed by the State

SECTION III C
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Landscape Contractors Board in accordance with ORS 701.035 to 701.055 before the subcontractors commence work under this contract.

OAR 137-049-0200(2). Unless otherwise provided in the Contract, the Contractor shall not assign, sell, dispose of, or transfer rights, or delegate duties under the Contract, either in whole or in part, without the Contracting Agency's prior Written consent. Unless otherwise agreed by the Contracting Agency in Writing, such consent shall not relieve the Contractor of any obligations under the Contract. Any assignee or transferee shall be considered the agent of the Contractor and be bound to abide by all provisions of the Contract. If the Contracting Agency consents in Writing to an assignment, sale, disposal or transfer of the Contractor's rights or delegation of Contractor's duties, the Contractor and its surety, if any, shall remain liable to the Contracting Agency for complete performance of the Contract as if no such assignment, sale, disposal, transfer or delegation had occurred unless the Contracting Agency otherwise agrees in Writing.

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SECTION IV

PAYMENT AND PERFORMANCE BONDS

Bond No. 811690P

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That, WHEREAS, the City of Oregon City, State of Oregon, on December 20 2017, 2017, has awarded to Andy Medcalf Construction Co., hereinafter designated as "Principal", a Contract for construction of City of Oregon City Community Development TI at Mt. Pleasant Annex, the terms and provisions of which contract are incorporated herein by reference, and;

WHEREAS, said Principal is required to furnish a bond in connection with this said Contract, providing that if said Principal, or any of his or its subcontractors, shall fail to pay for any materials, provisions, provender or other supplies or teams used in, upon, for, or about the performance of the work contracted to be done, or any other work or labor done thereon of any kind, the Surety of this body will pay the same to extend hereinafter set forth;

NOW, THEREFORE, we the Principal and Developers Surety and Indemnity Company, as Surety, are held and firmly bound unto the City of Oregon City, State of Oregon, in the penal sum of Eight Hundred Fifty Four Thousand Five Hundred Eighty Two and N/100---- Dollars (\$ 854,582.00), lawful money of the United States, being one hundred percent (100%) of the Contract amount for the payment of which sum well and truly to be made, we bond ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

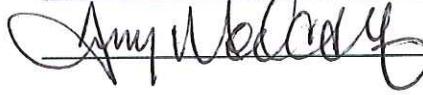
NOW, THEREFORE, if the above bounden Principal and all of his subcontractor shall promptly make payment to all persons supplying labor and material or amounts due in the prosecution of the work provided for in said Contract, and any and all duly authorized modifications of said Contract that may hereafter be made, then this obligation shall be void; otherwise, this obligation shall remain in full force and virtue; and if the bounden Principal or any of his subcontractors fails to promptly pay any of the persons or amounts due with respect to work or labor performed by any such claimant, the Surety will pay for the same, in an amount not exceeding the sum specified in this bond, and also in case suit brought upon this bond, a reasonable attorney's fee, to be fixed by the court; and this bond shall inure to the benefit of any persons so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

The bond shall inure to the benefit of any all persons, companies and corporations entitled to file claims, so as to give a right of action to them or their assigns in any suit brought upon this bond.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder, or the Specifications accompanying the same shall in any wise affect its obligations on this bond; and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract, or to the work or to the Specifications.

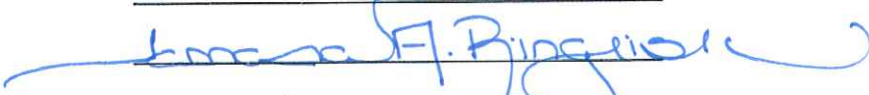
IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this 6th day of December, 2017, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Andy Medcalf Construction Co.



Principal

Developers Surety and Indemnity Company



Tamara A. Ringeisen ATTORNEY-IN-FACT

Attorney-in-Fact, Surety

Propel Insurance, 805 SW Broadway, Portland, OR 97205

Name and Address

Local Office of Agent

Bond No. 811690P
PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS: That, WHEREAS, the City of Oregon City; of Oregon, on December 20 2017, 2017, has awarded to Andy Medcalf Construction Co. hereinafter designated as the "Principal", a Contract for construction of City of Oregon City Community Development Department TI, the terms and provisions of which Contract are incorporated herein by reference, and;

WHEREAS, said Principal is required under the terms of said Contract to furnish a bond for the faithful performance of said Contract;

NOW, THEREFORE, we, the Principal and Developers Surety and Indemnity Company _____, as Surety, are held and firmly bound unto the City of Oregon City, State of Oregon, in the penal sum of Eight Hundred Fifty Four Thousand Five Hundred Dollars (\$ 854,582.00), lawful money of the United States, being one hundred percent (100%) of the Contract amount for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if the above bound Principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and faithfully perform the covenants, conditions, and agreements in the said Contract and any alterations made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City of Oregon City, its officers and agents, as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and virtue.

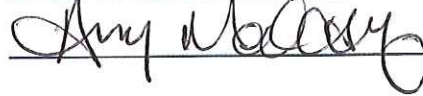
As a condition precedent to the satisfactory completion of the said Contract, the above obligation to the amount of Eight Hundred Fifty Four Thousand Five Hundred Dollars (\$ 854,582.00), shall hold good for a period of one (1) year after the completion and acceptance of the said work, during which time if the above bounden Principal, his or its heirs, executors, administrators, successors or assigns shall fail to make full, complete and satisfactory repair and replacements or totally protect the said City of Oregon City from loss or damage made evident during said period of one (1) year from the date of acceptance of said work, and resulting from or caused by defective materials or faulty workmanship in the prosecution of the work done, the above obligation in the said sum of Eight Hundred Fifty Four Thousand Five Hundred Eighty Two Dollars, (\$ 854,582.00 and No/100), shall remain in full force and virtue; otherwise the above obligation shall be void.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration of addition to the terms of the Contract or to the work to be performed thereunder or the Specifications accompanying the same shall in any wise affect its obligations on this bond; and it does hereby waive notice of any such change, extension of time alteration or addition to the terms of the Contract, or to the work, or to the Specifications

In the event the City of Oregon City or its successors or assigns, shall be the prevailing party in an action brought upon this bond, then in addition to the penal sum hereinabove specified, we agree to pay to said City of Oregon City, or its successors or assigns, a reasonable sum on account of attorney's fees in such action, which sum shall be fixed by the court.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this 6th day of December, 2017, the name and corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Andy Medcalf Construction Co.



Principal

Developers Surety and Indemnity Company



Tamara A. Ringeisen ATTORNEY-IN-FACT

Attorney-in-Fact, Surety

Propel Insurance, 805 SW Broadway, Portland, OR 97205

Name and Address
Local Office of Agent

**POWER OF ATTORNEY FOR
DEVELOPERS SURETY AND INDEMNITY COMPANY
INDEMNITY COMPANY OF CALIFORNIA
PO Box 19725, IRVINE, CA 92623 (949) 263-3300**

KNOW ALL BY THESE PRESENTS that except as expressly limited, DEVELOPERS SURETY AND INDEMNITY COMPANY and INDEMNITY COMPANY OF CALIFORNIA, do each hereby make, constitute and appoint:

Christopher Kinyon, Julie R. Truitt, Karen C. Swanson, Sara Sophie Sellin, Aliceon A. Keltner, Jamie Diemer, Carley Espiritu, Misti M. Webb, Michael S. Mansfield, David W. Ross, Tamara A. Ringeisen, James Roy Cox, Linda Diane Shaddon, Dana Marie Brinkley, Annelies M. Richie, Cynthia L. Jay, Kyle Joseph Howat, jointly or severally

as their true and lawful Attorney(s)-in-Fact, to make, execute, deliver and acknowledge, for and on behalf of said corporations, as sureties, bonds, undertakings and contracts of suretyship giving and granting unto said Attorney(s)-in-Fact full power and authority to do and to perform every act necessary, requisite or proper to be done in connection therewith as each of said corporations could do, but reserving to each of said corporations full power of substitution and revocation, and all of the acts of said Attorney(s)-in-Fact, pursuant to these presents, are hereby ratified and confirmed.

This Power of Attorney is granted and is signed by facsimile under and by authority of the following resolutions adopted by the respective Boards of Directors of DEVELOPERS SURETY AND INDEMNITY COMPANY and INDEMNITY COMPANY OF CALIFORNIA, effective as of January 1st, 2008.

RESOLVED, that a combination of any two of the Chairman of the Board, the President, Executive Vice-President, Senior Vice-President or any Vice President of the corporations be, and that each of them hereby is, authorized to execute this Power of Attorney, qualifying the attorney(s) named in the Power of Attorney to execute, on behalf of the corporations, bonds, undertakings and contracts of suretyship; and that the Secretary or any Assistant Secretary of either of the corporations be, and each of them hereby is, authorized to attest the execution of any such Power of Attorney;

RESOLVED, FURTHER, that the signatures of such officers may be affixed to any such Power of Attorney or to any certificate relating thereto by facsimile, and any such Power of Attorney or certificate bearing such facsimile signatures shall be valid and binding upon the corporations when so affixed and in the future with respect to any bond, undertaking or contract of suretyship to which it is attached.

IN WITNESS WHEREOF, DEVELOPERS SURETY AND INDEMNITY COMPANY and INDEMNITY COMPANY OF CALIFORNIA have severally caused these presents to be signed by their respective officers and attested by their respective Secretary or Assistant Secretary this 6th day of February, 2017.

By: *Daniel Young*
Daniel Young, Senior Vice-President

By: *Mark Lansdon*
Mark Lansdon, Vice-President



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Orange

On February 6, 2017 before me, Lucille Raymond, Notary Public
Date Here Insert Name and Title of the Officer
personally appeared Daniel Young and Mark Lansdon
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature *Lucille Raymond*
Lucille Raymond, Notary Public



Place Notary Seal Above

CERTIFICATE

The undersigned, as Secretary or Assistant Secretary of DEVELOPERS SURETY AND INDEMNITY COMPANY or INDEMNITY COMPANY OF CALIFORNIA, does hereby certify that the foregoing Power of Attorney remains in full force and has not been revoked and, furthermore, that the provisions of the resolutions of the respective Boards of Directors of said corporations set forth in the Power of Attorney are in force as of the date of this Certificate.

This Certificate is executed in the City of Irvine, California, this 6th day of December 2017

By: *Cassie J. Barrisford*
Cassie J. Barrisford, Assistant Secretary





STATE OF OREGON

STATUTORY PUBLIC WORKS BOND

Surety bond #: 106235135

CCB # (if applicable): 198478

We, Andy Medcalf Construction Co., as principal, and Travelers Casualty & Surety Company of America, a corporation qualified and authorized to do business in the State of Oregon, as surety, are held and firmly bound unto the State of Oregon for the use and benefit of the Oregon Bureau of Labor and Industries (BOLI) in the sum of thirty thousand dollars (\$30,000) lawful money of the United States of America to be paid as provided in ORS chapter 279C, as amended by Oregon Laws 2005, chapter 360, for which payment well and truly to be made, we bind ourselves, our heirs, personal representatives, successors and assigns, jointly and severally, firmly by this agreement.

WHEREAS, the above-named principal wishes to be eligible to work on public works project(s) subject to the provisions of ORS chapter 279C, as amended by Oregon Laws 2005, chapter 360, and is, therefore, required to obtain and file a statutory public works bond in the penal sum of \$30,000 with good and sufficient surety as required pursuant to the provisions of section 2, chapter 360, Oregon Laws 2005, conditioned as herein set forth.

NOW, THEREFORE, the conditions of the foregoing obligations are that if said principal with regard to all work done by the principal as a contractor or subcontractor on public works project(s), shall pay all claims ordered by BOLI against the principal to workers performing labor upon public works projects for unpaid wages determined to be due, in accordance with ORS chapter 279C, as amended by Oregon Laws 2005, chapter 360, and OAR Chapter 839, then this obligation shall be void; otherwise to remain in full force and effect.

This bond is for the exclusive purpose of payment of wage claims ordered by BOLI to workers performing labor upon public works projects in accordance with ORS chapter 279C, as amended by Oregon Laws 2005, chapter 360.

This bond shall be one continuing obligation, and the liability of the surety for the aggregate of any and all claims which may arise hereunder shall in no event exceed the amount of the penalty of this bond.

This bond shall become effective on the date it is executed by both the principal and surety and shall continuously remain in effect until depleted by claims paid under ORS chapter 279C, as amended by Oregon Laws 2005, chapter 360, unless the surety sooner cancels the bond. This bond may be cancelled by the surety and the surety be relieved of further liability for work performed on contracts entered after cancellation by giving 30 days' written notice to the principal, the Construction Contractors Board, and BOLI. Cancellation shall not limit the responsibility of the surety for the payment of claims ordered by BOLI relating to work performed during the work period of a contract entered into before cancellation of this bond.

IN WITNESS WHEREOF, the principal and surety execute this agreement. The surety fully authorizes its representatives in the State of Oregon to enter into this obligation.

SIGNED, SEALED AND DATED this 21st day of May, 20 15

Surety by: Travelers Casualty & Surety Company of America

Principal by: Andy Medcalf Construction Co.

Travelers Casualty & Surety Company of America (Seal)

Company Name

Molly K Mansfield
Signature

Attorney-in-Fact

Title (e.g. Attorney-in-Fact)

ANDY MEDCALF
Name

Andy Medcalf
Signature

PRESIDENT
Title

PO BOX 12969
Address

SALEM
City

ORE
State

97309
Zip

SEND BOND TO:

Construction Contractors Board
PO Box 14140
Salem, OR 97309-5052
Telephone: (503) 378-4621

TRAVELERS **POWER OF ATTORNEY**

Farmington Casualty Company
 Fidelity and Guaranty Insurance Company
 Fidelity and Guaranty Insurance Underwriters, Inc.
 St. Paul Fire and Marine Insurance Company
 St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company
 Travelers Casualty and Surety Company
 Travelers Casualty and Surety Company of America
 United States Fidelity and Guaranty Company

Attorney-In Fact No. 227325

Certificate No. 005723586

KNOW ALL MEN BY THESE PRESENTS: That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

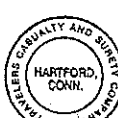
Molly K. Mansfield

of the City of Portland, State of Oregon, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

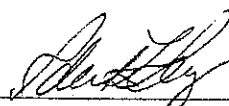
IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 5th day of December, 2013.

Farmington Casualty Company
 Fidelity and Guaranty Insurance Company
 Fidelity and Guaranty Insurance Underwriters, Inc.
 St. Paul Fire and Marine Insurance Company
 St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company
 Travelers Casualty and Surety Company
 Travelers Casualty and Surety Company of America
 United States Fidelity and Guaranty Company



State of Connecticut
 City of Hartford ss.

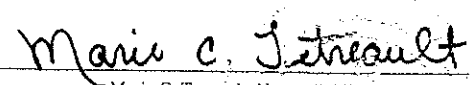
By: 

Robert L. Raney, Senior Vice President

On this the 5th day of December, 2013, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.
 My Commission expires the 30th day of June, 2016.




 Marie C. Tetreault, Notary Public

ACORDTM**CERTIFICATE OF LIABILITY INSURANCE**

DATE (MM/DD/YYYY)

12/06/2017

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Propel Insurance Portland Commercial Insurance 805 SW Broadway, Suite 2300 Portland, OR 97205-3363	CONTACT NAME: Misti Webb PHONE (A/C, No, Ext): 503 467-2806 E-MAIL ADDRESS: Misti.Webb@PropelInsurance.com		FAX (A/C, No): 866 577-1326
	INSURER(S) AFFORDING COVERAGE		NAIC #
INSURED Andy Medcalf Construction Po Box 12969 Salem, OR 97309	INSURER A: United Fire & Casualty Company		13021
	INSURER B: Landmark American Insurance Com		33138
	INSURER C: SAIF Corporation		36196
	INSURER D:		
	INSURER E:		
INSURER F:			

COVERAGES**CERTIFICATE NUMBER:****REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL SUBR INSR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	☒ COMMERCIAL GENERAL LIABILITY ☐ CLAIMS-MADE ☒ OCCUR PD Ded:1,000 GEN'L AGGREGATE LIMIT APPLIES PER: ☐ POLICY ☐ PRO-JECT ☐ LOC OTHER:		60494123	07/20/2017	07/20/2018	EACH OCCURRENCE \$1,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$100,000 MED EXP (Any one person) \$5,000 PERSONAL & ADV INJURY \$1,000,000 GENERAL AGGREGATE \$2,000,000 PRODUCTS - COMP/OP AGG \$2,000,000 WA Stop Gap \$1,000,000
A	AUTOMOBILE LIABILITY ☒ ANY AUTO ☐ ALL OWNED AUTOS ☒ HIRED AUTOS ☐ SCHEDULED AUTOS ☒ NON-OWNED AUTOS		60494123	07/20/2017	07/20/2018	COMBINED SINGLE LIMIT (Ea accident) \$1,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
A	☒ UMBRELLA LIAB ☒ OCCUR ☐ EXCESS LIAB ☐ CLAIMS-MADE ☐ DED ☒ RETENTION \$0		60494123	07/20/2017	07/20/2018	EACH OCCURRENCE \$2,000,000 AGGREGATE \$2,000,000 \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? ☒ Y ☐ N (Mandatory in NH) If yes, describe under DESCRIPTION OF OPERATIONS below	N/A	774134	09/01/2017	09/01/2018	PER STATUTE ☐ OTH-ER ☐ E.L. EACH ACCIDENT \$500,000 E.L. DISEASE - EA EMPLOYEE \$500,000 E.L. DISEASE - POLICY LIMIT \$500,000
B	Excess Liability		LHA243031	07/20/2017	07/20/2018	1,000,000
A	Leased/Rented		60494123	07/20/2017	07/20/2018	100,000
A	Install Floater		60494123	07/20/2017	07/20/2018	600,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

****Worker's Compensation Info****

Excluded Officer: Andy J Medcalf

CERTIFICATE HOLDER**CANCELLATION**

City of Oregon City 221 Molalla Ave., Suite 200 Oregon City, OR 97045	SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS. AUTHORIZED REPRESENTATIVE <i>Misti Webb</i>
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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**ADDITIONAL INSURED – OWNERS, LESSEES OR
CONTRACTORS
(WITH LIMITED COMPLETED OPERATIONS COVERAGE)**

This endorsement modifies insurance provided under the following:

**COMMERCIAL GENERAL LIABILITY COVERAGE PART
BUSINESSOWNERS COVERAGE FORM**

SCHEDULE

NAME OF PERSON OR ORGANIZATION

Any person or organization to whom or to which the named insured is obligated by a virtue of a written contract to provide insurance that is afforded by this policy. Where required by contract, the officers, officials, employees, directors, subsidiaries, partners, successors, parents, divisions, architects, surveyors and engineers are included as additional insureds. All other entities, including but not limited to agents, volunteers, servants, members and partnerships are included as additional insureds, if required by contract, only when acting within the course and scope of their duties controlled and supervised by the primary (first) additional insured. If an Owner Controlled Insurance Program is involved, the coverage applies to off-site operations only. If the purpose of this endorsement is for bid purposes only, then no coverage applies.

WHO IS AN INSURED: (Section II)

This section is amended to include as an insured the person or organization within the scope of the qualifying language above, but only to the extent that the person or organization is held liable for your acts or omissions in the course of "your work" for that person or organization by or for you. The "products-completed operations hazard" portion of the policy coverage as respects the additional insured does not apply to any work involving or related to properties intended for residential or habitation occupancy (other than apartments). This clause does not affect the "products-completed operations" coverage provided to the named insured(s).

WAIVER OF SUBROGATION:

We waive any right of recovery, when required by written contract, that we may have against the person or organization within the scope of

the qualifying language above because of payments we make for injury.

LOCATION OF JOB:

The job location must be within the State of domicile of the named insured, or within any contiguous State thereto.

DESCRIPTION OF WORK:

The type of work performed must be that as described under classifications in the CGL Coverage Part Declarations.

PRIMARY CLAUSE:

When this endorsement applies and when required by written contract, such insurance as is afforded by the general liability policy is primary insurance and other insurance shall be excess and shall not contribute to the insurance afforded by this endorsement.

EXCLUSION

This insurance provided to the additional insured does not apply to "bodily injury", "property damage" or "personal and advertising injury" arising out of an architect's, engineer's or surveyor's rendering or failure to render any professional services, including:

1. The preparing, approving, or failing to prepare or approve, maps, designs, shop drawings, opinions, reports, surveys, field orders, change orders, or drawings and specifications; and
2. Supervisory, inspection, architectural or engineering activities.

Endorsement EFFECTIVE DATE: SEE DEC

Endorsement EXPIRATION DATE: SEE DEC

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THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

DESIGNATED CONSTRUCTION PROJECT(S) GENERAL AGGREGATE LIMIT

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE

Designated Construction Project(s):
ALL PROJECTS

Information required to complete this Schedule, if not shown above, will be shown in the Declarations.

- A.** For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage A, and for all medical expenses caused by accidents under Section I – Coverage C, which can be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:
1. A separate Designated Construction Project General Aggregate Limit applies to each designated construction project, and that limit is equal to the amount of the General Aggregate Limit shown in the Declarations.
 2. The Designated Construction Project General Aggregate Limit is the most we will pay for the sum of all damages under Coverage A, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard", and for medical expenses under Coverage C regardless of the number of:
 - a. Insureds;
 - b. Claims made or "suits" brought; or
 - c. Persons or organizations making claims or bringing "suits".
 3. Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the Designated Construction Project General Aggregate Limit for that designated construction project. Such payments shall not reduce the General Aggregate Limit shown in the Declarations nor shall they reduce any other Designated Construction Project General Aggregate Limit for any other designated construction project shown in the Schedule above.
 4. The limits shown in the Declarations for Each Occurrence, Damage To Premises Rented To You and Medical Expense continue to apply. However, instead of being subject to the General Aggregate Limit shown in the Declarations, such limits will be subject to the applicable Designated Construction Project General Aggregate Limit.

B. For all sums which the insured becomes legally obligated to pay as damages caused by "occurrences" under Section I – Coverage A, and for all medical expenses caused by accidents under Section I – Coverage C, which cannot be attributed only to ongoing operations at a single designated construction project shown in the Schedule above:

1. Any payments made under Coverage A for damages or under Coverage C for medical expenses shall reduce the amount available under the General Aggregate Limit or the Products-completed Operations Aggregate Limit, whichever is applicable; and
2. Such payments shall not reduce any Designated Construction Project General Aggregate Limit.

C. When coverage for liability arising out of the "products-completed operations hazard" is provided, any payments for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard" will reduce the Products-completed Operations Aggregate Limit, and not reduce the General Aggregate Limit nor the Designated Construction Project General Aggregate Limit.

D. If the applicable designated construction project has been abandoned, delayed, or abandoned and then restarted, or if the authorized contracting parties deviate from plans, blueprints, designs, specifications or timetables, the project will still be deemed to be the same construction project.

E. The provisions of Section III – Limits Of Insurance not otherwise modified by this endorsement shall continue to apply as stipulated.

All terms and conditions of this policy apply unless modified by this endorsement.

SECTION V

CONTRACT GENERAL REQUIREMENTS

1.0 COMPLETION TIME LIMIT

After the contract has been signed, and the "Notice to Proceed" has been issued, the project shall be commenced within ten days. The project shall be at substantial completion 114 consecutive calendar days after "Notice to Proceed" not to exceed March 31, 2018. For every day after this time limit that the Contractor has not achieved Substantial Completion, Owner will assess Liquidated Damages in the amount specified in the Contract Agreement.

Substantial Completion is defined in Section 017150, Substantial and Final Completion.

Final Acceptance: The project shall be ready for final acceptance within 128 consecutive calendar days after "Notice to Proceed", not to exceed April 13, 2018. For Final Acceptance, all work shall be completed.

2.0 WORK SCHEDULE

The contractor shall notify the City Engineer a minimum of 48 hours prior to commencing work.

The contractor shall perform all work in an expeditious manner, minimizing delays and inconvenience to local residents.

3.0 EXISTING UTILITIES

The Contractor shall be responsible for checking actual utility locations in the field and checking with appropriate agencies that may have underground facilities within the project limits. The Contractor shall notify the utilities at least 2 business days, but not more than 10 business days before commencing any excavations, the excavator shall notify a utilities notifications system of the date location and depth of the proposed excavation and the type of work to be performed. Notifying a utilities notification system constitutes notice only to the participating members of that service. If no utilities notification system is available, or if the owner of the underground facilities is not a member of a utilities notification system, the excavator shall give the same notice to each owner of underground facilities who is known to the excavator or who can be identified and contacted by the excavator.

4.0 USE OF UTILITIES BY CONTRACTOR

4.1 ELECTRICITY

4.2 CONTRACTOR'S WATER

The Contractor shall be responsible for providing all necessary water to complete the Work. In the event that the Contractor desires to use water from the public water system, it shall be the responsibility of the Contractor to discern the ownership of the public water system and make necessary arrangements with the owner of said public water system for purchase and use of water from fire hydrants. All costs for water shall be incidental to the lump sum prices for other items of work. If water is used from fire hydrants, the Contractor shall maintain adequate cross connection control and obtain a fire hydrant meter from the City of Oregon City Public Works Operations Center located at 122 S. Center Street, Oregon City. A refundable deposit will be required and refunded to the general contractor upon return of the meter.

4.3 TEMPORARY ELECTRIC POWER

4.4 TELEPHONE

The Contractor shall be responsible for providing for and on behalf of his/her work under the contract mobile telephone service.

4.5 SANITARY FACILITIES

The Contractor shall provide sanitary facilities for all workers in accordance with pertinent regulations.

5.0 MATERIALS

All materials shall be as specified in the Technical Specifications, plans, noted or other technical descriptions included herewith, unless otherwise noted. The Owner reserves the right to sample and test all material according to specifications requirements cited in this contract.

6.0 TRAFFIC CONTROL

Maintenance of traffic and traffic control though the work area shall be the responsibility of the contractor. If the contractor fails at any time during the duration of the project to provide adequate access for local traffic the City may, at the discretion of the City Engineer, and giving the contractor four (4) hours notice, perform the necessary work to restore traffic and deduct the cost of such work from the contract price. The provisions for traffic control shall perform the necessary work to restore traffic and deduct the costs of such work from the contract price. The following provisions shall be made for traffic control:

1. All work done under this contract shall conform to the Manual on Uniform Traffic Control Devices for Streets and Highways, as currently modified by the Oregon Department of Transportation.
2. The contractor shall insure that during non-work hours, that on-call staff is available to maintain all traffic control devices for the project. Both the City Engineer and the Chief of Police will be provided up to date contact information on these people. Failure to comply with this provision will cause the contractor to be billed for any services required to be provided by City forces to provide adequate protection to the traveling public during non-work hours.
3. Traffic control and temporary protective and directional devices may be used outside the limits of the protection when they have direct bearing or reference to the work under contract.
4. The Contractor shall consider at least the following factors in restricting traffic flow (consistent with notes above):
 - a. Emergency vehicle access.
 - b. Sufficiency of traffic control personnel and devices.
 - c. Prior warning to public and residents.
 - d. Notification to TriMet, School District, Post Office, garbage companies, and City/County emergency dispatch agencies.
5. At the pre-construction conference, the contractor shall provide the name, address and telephone number of the individual responsible for project and construction traffic controls during non-working hours.
6. The Contractor shall not interrupt access to any private driveway for more than three consecutive hours unless written permission has been given to the Contractor by the owner of the property affected. Advance notice of forty-eight hours shall be given by the Contractor to the affected landowners and residents.

7.0 CONTRACTOR'S USE OF PREMISES

The Contractor shall exercise care to protect adjacent existing structures from damage. All debris and excess materials shall be removed and disposed of at the direction of the City Engineer.

8.0 CONTROL OF WORK

All work done under this contract shall not be deemed complete until accepted by the City Engineer. The City Engineer shall decide any and all questions that may arise as to the quality and/or acceptability of the materials used and/or work performed. Final approval and acceptance of any and all work performed under this contract shall be the responsibility of the City Engineer.

9.0 BIDDING REQUIRMENTS

9.1 EXAMINATION OF WORK SITE AND BIDDING DOCUMENTS

Prospective bidders may inspect the site of the contract before bidding. Questions regarding this project should be directed to Laura Terway, Community Development Director at (503) 496-1553.

10.0 CONTRACTOR'S RESPONSIBILITY

It is understood that the plans, specifications and other contract documents do not purport to control the method of preparing the work, but only the requirements as to the nature of the completed work. The Contractor assumes the entire responsibility for the method of performing and installing the work. Suggestions as to the method of performing and installing the work included in the contract documents shall be deemed advisory only and the feasibility of such methods, or the lack thereof, shall not affect the Contractor's liability or status as an independent Contractor under this contract.

11.0 PREPARATION OF PROPOSAL

The successful bidder will be required to furnish two bonds both equal to 100 percent (100%) of the amount bid, one for the faithful performance of the contract and the other for labor and material payment.

12.0 BIDDER'S GUARANTY

Not used.

13.0 REVISION OR WITHDRAWAL OF PROPOSALS

13.1 WITHDRAWAL OF PROPOSALS

Any proposal may be withdrawn by the bidder, if requested in writing, by the bidder or his/her duly authorized representative, prior to the time fixed for the opening of bids. The withdrawal of a bid shall not prejudice the right of a bidder to file a new bid within the time allowed in the invitation to bid.

14.0 DISQUALIFICATION OF BIDDERS

More than one proposal from an individual, firm or partnership, corporation or association, under the same or different names, may disqualify all such proposals submitted by that entity in Owner's sole discretion. Proposals in which prices bid for individual unit appear intentionally unbalanced so as to leave the total bid competitive, also may be disqualified.

15.0 AWARD AND EXECUTION OF CONTRACT

15.1 AWARD OF CONTRACT

The Owner shall award the contract or reject all proposals within forty-five (45) days after the bid opening. The successful bidder shall execute a contract within eight (8) calendar days from the date of written notification, and if not, the guaranteed amount shall be forfeited to the Owner.

The time of completion of the work contemplated by this contract shall not be extended or changed by the lapse of time between the date the Owner received proposals and execution of the contract. In specifying the dates for completion, both parties understand that a period of not more than forty (40) days may elapse between the opening of the proposals and submission of the contract for execution. If the owner finds that the public interest requires a delay in consideration of the bid award beyond the forty (40) days contemplated herein, the bidder at its option may be released from its bid bond or may grant an extension of time for the Owner to consider award of the contract for his/her execution.

Owner may consider an extension of time to complete the work if contractor makes application for same to Owner no later than five (5) days after contractor knows or should know of a cause of noncompensable but excusable delay. Such causes of delay shall be deemed to be limited to labor disputes beyond the control of contractor, acts of God, unusual and unforeseeable severe weather, or any delays caused in whole or part by either parties' non-compensable conduct.

In comparing alternate bids, the Owner in its sole discretion may select a higher cost alternate if the higher alternate will better serve its interests.

15.2 PERFORMANCE AND PAYMENT BONDS

Upon acceptance of this contract, or as a condition to continue performance hereunder, contractor, at the option of the Owner, shall execute and deliver a Performance and Payment Bond both in an amount equal to the total contract sum, and fully executed by a surety company or companies, authorized to do business in the State of Oregon and approved by the Owner, which bonds shall be conditioned upon a compliance with and fulfillment of all terms and provisions of the contract. Contractor shall pay the costs of any bond. The Attorney-in-Fact (Registered Agent) who executes any bond must file with each bond a notarized and effectively dated copy of his/her power of attorney. The Performance and Payment Bond shall be issued by a surety company or companies with Best's Rating of A.VII or better.

In addition and before final acceptance of the project, contractor shall provide a maintenance and warranty bond in an amount equal to the total amount paid on the contract together with any amendments in a form approved by the Owner. Such maintenance and warranty bond shall be conditioned upon the final project being completed and guaranteed against defects in materials and workmanship. Such maintenance and warranty bond shall continue in effect during the full term of any warranty period as well as any extension of said warranty period.

15.3 EXECUTION OF THE CONTRACT AGREEMENT AND BONDS

The successful bidder shall obtain all necessary bonds and permits at its own initiative and expense, including those within control of Owner, except as the parties may otherwise agree in writing.

The contractor shall warrant all equipment and materials furnished and work performed by him/her for a period of one (1) year from the date of written acceptance of the project. The contractor shall provide a performance bond in the amount of 100% of the work to be in effect for that one (1) year maintenance period.

The Certificate(s) of insurance or binders shall be submitted to and approved by the owner with the City and the Engineer named as additional insured on an occurrence basis. Contractor's insurance carrier shall be financially responsible and registered in good standing with the Oregon Insurance Commissioner. All policies shall be kept in force until the Contractor's work is accepted by the Owner. Insurance policies (covering all operations under this Contract or if so noted, for extended operations) which expire before the Contractor's work is accepted by the Owner (or where noted for extended operations, through the period of guarantee) shall be replaced or renewed immediately and evidence of same submitted to the Owner for its approval.

16.0 SCOPE OF WORK

16.1 PLANS AND SPECIFICATIONS

If there is a conflict between contract documents, the document highest in precedence shall control. The precedence shall be:

- First: Permits as may be required by law.
- Second: Contract Agreement
- Third: Bidder's Proposal
- Fourth: Technical Provisions (Technical Specifications and Drawings)
- Fifth: General Requirements, General Conditions, and Supplementary Conditions

Change orders, supplemental agreements and approved revisions to plans and specifications will take precedence over documents listed above. Detailed plans shall have precedence over general plans as modified by the General Requirements and Technical Provisions applicable to this Project.

17.0 CONTROL OF WORK

It will be the direct responsibility of the Prime Contractor to furnish every subcontractor a complete set of project plans and insure that these plans are on the project site and in use when the subcontractor is performing that portion of the project.

The contractor shall be responsible for any process control sampling, testing, measurement, and inspection needed to insure that the finished work complies with specifications. When density testing is required for assurance and /or acceptance testing, the contractor shall furnish and operate the nuclear gauge or shall retain an independent testing firm to perform the compaction testing. The testing shall be

conducted under the observation of the engineer and performed on all surfaces regardless of density requirements unless otherwise directed by the engineer. All test results shall be provided in written report form to the engineer.

The contractor shall give the attention necessary to keep the work progressing at a rate satisfactory to the engineer. The contractor shall provide, at all times, a competent superintendent for all work on the project. The superintendent shall be readily accessible on a daily basis, have a set of plans, specifications, special provisions, and addenda, and be experienced in the type of work being performed. The superintendent shall have the authority to receive and carry out, without delay, the engineer's instructions and orders and to make arrangements for necessary materials, equipment, and labor.

The contractor shall allow the engineer access at all times, during normal office hours, to books and records of the contractor and the contractor's subcontractors which pertain to the contract, and furnish the engineer facts necessary to determine actual cost of any part of all of the work. The engineer will consider a request for confidentiality to protect trade secrets.

If the engineer is not provided proper facilities by the contractor for keeping strict accounting of cost, then the contractor agrees to waive any claim for extra compensation.

Contractor shall schedule work Monday through Friday only. Contractor shall establish a standard daily work schedule for hour beginning and ending work that is acceptable to the Owner.

Contractor shall not trespass on private property or use business or residential garden hoses without the property owners written approval.

18.0 PROTECTION OF CITY PROPERTY

18.1 RESPONSIBILITIES OF THE CONTRACTOR:

It is the contractors responsibility to protect sidewalks, asphalt paving, concrete, trees, shrubs, and any lawn areas at all times from contractor damage of any type. Costs for cleaning or repair shall be borne by the contractor, as the Owner may deem appropriate.

Should, during the course of Contractor's work, the Contractor observe or suspect the presence of asbestos fiber, the Contractor shall immediately stop work and notify the Owner of its findings. Should the Contractor's schedule be delayed because of such findings, the Contractor will remove itself from the project and wait the Owner's order to return to work, at no penalty to the Owner.

Debris shall not be permitted to remain on site and shall be disposed of daily and/or as directed by Owner.

It is the Contractors responsibility to manage a safe work environment.

Contractor shall take any means necessary to secure a safe work site for both the safety or all personnel and the public.

BOLI PREVAILING WAGE RATES (PWR)

By this reference, the Oregon Bureau of Labor and Industries Prevailing Wage Rates are in effect for this contract. They can be found on line at www.oregon.gov/boli/whd/pwr/Pages/index.aspx.

More specifically, they include:

<i>Prevailing Wage Rates for Public Works Contracts in Oregon</i>	<i>Effective July 1, 2017 Amendments effective October 1, 2017</i>
<i>Prevailing Wage Rates Apprenticeship Rates</i>	<i>Effective October 1, 2017</i>
<i>Definitions of Covered Occupants for Public Works Contracts in Oregon</i>	<i>Effective: Jan, 1 2016</i>

SECTION 011000

SPECIAL TECHNICAL PROVISIONS

PART 1 - GENERAL

These Special Technical Provisions supplement and amplify certain sections of the Standard General Conditions and Supplementary General Conditions. The Standard General Conditions and Supplementary General Conditions shall apply except as modified herein.

These Special Technical Provisions and additional technical specifications may contain occasional requirements not pertinent to the project. However, these specifications shall apply in all particulars insofar as they are applicable to this project.

1.1 APPLICABLE STANDARD SPECIFICATIONS AND PLANS

The current City of Oregon City, Oregon, "Design and Construction Standards/Drawings", (including all revisions at date of bid opening), apply except as may be modified herein. In the case of discrepancy, unless noted otherwise herein, the more restrictive provisions shall apply.

1.2 SCOPE OF WORK

The work to be performed under these specifications and drawings consists of furnishing all labor, materials, services, and equipment necessary to complete construction as described in the specifications and drawings issued by the architect of record.

The above general outline of principal features of the work does not in any way limit the responsibility of the CONTRACTOR(s) to perform all work and furnish all equipment, labor and materials required by the specifications and drawings. The drawings and specifications shall be considered and used together. Anything appearing as a requirement of either shall be accepted as applicable to both even though not so stated therein or shown.

No attempt has been made in these specifications or drawings to segregate work covered by any trade or subcontract under one specification. Such segregation and establishment of subcontract limits will be solely a matter of specific agreement between the CONTRACTOR and its subcontractors and shall not be based upon any inclusion, segregation or arrangement in or of these specifications.

1.3 COORDINATION OF DRAWINGS AND SPECIFICATIONS

The drawings and specifications are intended to describe and provide for a complete work. Any requirement in one is as binding as if stated in all. The CONTRACTOR shall provide any work or materials clearly implied in the Contract Documents even if the Contract Documents do not mention it specifically. If there is a conflict within the Contract Documents, it will be resolved by the following order of precedence:

- A. Permits for outside agencies required by law
- B. OWNER-CONTRACTOR Agreement
- C. Addenda to Contract Documents

- D. CONTRACTOR's Proposal
- E. Special Provisions
- F. Contract Drawings
- G. Technical Specifications
- H. Supplementary General Conditions
- I. General Conditions of the Contract
- J. Standard Specifications
- K. Standard Plans

Dimensions shown on the drawings or that can be computed shall take precedence over scaled dimensions. Notes on drawings are part of the drawings and govern in the order described above. Notes on drawings shall take precedence over drawing details.

The intent of the drawings and specifications is to prescribe the details for the construction and completion of the work which the CONTRACTOR undertakes to perform according to the terms of the Contract. Where the drawings or specifications describe portions of the work in general terms, but details are incomplete or silent, it is understood that only the best general practice is to prevail and that only materials and workmanship of the best quality are to be used. Unless otherwise specified, the CONTRACTOR shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the Contract in a manner satisfactory to the ARCHITECT/ENGINEER.

The contract drawings are designated by general title, sheet number and sheet title. When reference is made to the drawings, the "Sheet Number" of the drawing will be used. Each drawing bears the general title:

CITY OF OREGON CITY
COMMUNITY DEVELOPMENT DEPT. TI

The specific titles of each sheet are contained on A0.0 of Drawings.

1.4 CODE REQUIREMENTS

All work shall be done in strict compliance with the requirements of:

- A. 2014 Oregon Structural Specialty Code
- B. 2014 Oregon Mechanical Specialty Code
- C. 2014 Oregon Plumbing Specialty Code
- D. 2014 Oregon Electrical Specialty Code
- E. 2014 Oregon Energy Efficiency Specialty Code
- F. 2014 Oregon Fire Code
- G. National Electric Code
- H. National Electric Safety Code

- I. Oregon State Department of Labor and Industries
- J. City of Oregon City
- K. Clackamas County
- L. Oregon Department of Environmental Quality

In case of disagreement between codes or these specifications, the more restrictive shall prevail.

1.5 SUBSTANTIAL COMPLETION, FINAL COMPLETION, TIME OF COMPLETION, AND LIQUIDATED DAMAGES

The project shall be at Substantial Completion 114 consecutive calendar days after "Notice to Proceed". For every day after this time limit that the CONTRACTOR has not achieved Substantial Completion, OWNER will assess Liquidated Damages.

The project shall be at Final Completion 128 consecutive calendar days after "Notice to Proceed". For every day after this time limit that the CONTRACTOR has not achieved Final Completion, OWNER will assess Liquidated Damages.

Substantial Completion: As defined in Division 017150, Substantial and Final Completion.

Final Completion: As defined in Division 017150, Substantial and Final Completion.

The CONTRACTOR shall complete all work shown and specified within the time limits stated above and in Section IIIA, Contract Agreement. The written Notice to Proceed will be sent to the CONTRACTOR after the CONTRACTOR submits the signed Contract, Bonds and insurance certificates to the OWNER and those documents have been approved as to form and executed by the OWNER. The CONTRACTOR's attention is directed to Section IIIA, Contract Agreement, and

Section IIIB, Oregon City Public Improvement Standard Conditions, of the Contract Forms as it applies to time of completion and liquidated damages.

1.6 COORDINATION WITH OTHER CONTRACTORS AND WITH OWNER

Certain work within this contract may require connection to and coordination with the work of other contractors and OWNER. The CONTRACTOR under these specifications shall cooperate fully with all other contractors and OWNER and carefully fit its own work to such other work as may be directed by the ARCHITECT/ENGINEER. The CONTRACTOR shall not commit or permit any act to be committed which will interfere with the performance of work by any other contractor or the OWNER.

1.7 NOTIFICATION, EXPEDIENCE, AND ACCESS TO WORK

The CONTRACTOR shall notify the OWNER and ARCHITECT/ ENGINEER a minimum of 48 hours prior to commencing work. The CONTRACTOR shall perform all work in an expeditious manner, minimizing delays and inconvenience to local residents.

Access to the work shall be provided as may be required by the OWNER or its representatives, and all authorized representatives of the state and federal governments and any other agencies having jurisdiction over any phase of the work, for inspection of the progress of the work, the methods of construction or any other required purposes.

1.8 PERMITS AND LICENSES

Unless provided for otherwise in these contract documents, all permits, licenses and fees shall be obtained by the CONTRACTOR and all costs shall be borne by the CONTRACTOR. CONTRACTOR shall pay all plan check fees and other fees necessary to obtain permits and shall accommodate special inspections required thereof. CONTRACTOR shall be responsible for compliance with all permit provisions and shall accommodate all special inspections required thereof, all at no additional expense to the OWNER beyond prices as bid.

1.9 SITE INVESTIGATION AND PHYSICAL DATA

The CONTRACTOR acknowledges that it is satisfied as to the nature and location of the work and the general and local conditions, including but not limited to those bearing upon transportation, disposal, handling and storage of materials, availability of water, roads, groundwater, access to the sites, coordination with other contractors, and conflicts with pipelines, structures and other contractors. Information and data furnished or referred to herein is furnished for information only. Any failure by the CONTRACTOR to become acquainted with the available information and existing conditions will not be a basis for relief from successfully performing the work and will not constitute justification for additional compensation.

The CONTRACTOR shall verify the locations and elevations of existing pipelines, structures, grades and utilities, prior to construction. The OWNER assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR on the basis of the information made available.

1.10 FIELD SERVICE BY MANUFACTURER'S REPRESENTATIVE

The CONTRACTOR shall furnish the services of a manufacturer's or material supplier's representative for all major equipment and materials furnished by the CONTRACTOR or OWNER under this contract, to check, place in operation and test the installation, and train operating personnel. The manufacturer's representative shall be qualified and authorized to perform repairs and maintenance on the equipment.

The above gives a general scope of the services desired from the manufacturer's representative. It will be the responsibility of the CONTRACTOR and the equipment manufacturer to determine detailed requirements. Costs for services of the manufacturer's representative shall be included in the proposal of the CONTRACTOR. The operator training mentioned above shall include sufficient time during the CONTRACTOR's operation and testing period to fully explain to the operating personnel the features of the equipment and maintenance thereof.

1.11 CONSTRUCTION WITHIN PUBLIC RIGHTS-OF-WAY

When the work contemplated is wholly or partly within the right-of-way of a public agency such as a city, county or state, the OWNER will obtain from these agencies any right-of-way and street opening permits and all other necessary permit(s) required for the work. The CONTRACTOR shall abide by all regulations and conditions stipulated in the permit(s). Such conditions and requirements are hereby made a part of these specifications, as fully and completely as though the same were fully set forth herein. The CONTRACTOR shall examine the permit(s) granted to the OWNER by any city, county, state and federal agencies. Failure to do so will not relieve the CONTRACTOR from compliance with the requirements stated therein.

The CONTRACTOR shall obtain all construction permits and pay all fees or charges and furnish any bonds and insurance coverages as necessary to insure that all requirements of the city, county, state or federal agencies will be observed and the roadway and ditches are restored to their original condition or one equally satisfactory. A copy of all permits shall be kept on the work site for use of the ENGINEER.

1.12 CONSTRUCTION WITHIN PRIVATE EASEMENTS

When portions of the work contemplated are within easements held by the OWNER on private property, the CONTRACTOR shall ascertain for itself to what extent the width, status and special conditions attached to easements may have on its operations and all costs resulting therefrom shall be included and absorbed in the unit prices of the CONTRACTOR's bid. CONTRACTOR shall coordinate with private property owners and businesses if required. Landscaping, surface restoration and fence restoration shall be completed within 24 hours following piping and conduit installation and other construction work. Temporary fencing shall be provided continuously until such private fencing is properly restored.

The CONTRACTOR's attention is directed to Paragraph 6.13 of the General Conditions regarding safety and the protection of property. Certain portions of this project may require working in close proximity to existing structures and property within private easements. It is the CONTRACTOR'S responsibility to conduct its operations and limit the size of equipment used in such a manner so as to prevent damage to existing property from excessive vibration or from other direct or indirect CONTRACTOR operations. The cost associated with repairing or replacing property that is damaged by the CONTRACTOR's operations shall be the responsibility of the CONTRACTOR, in accordance with the General Conditions.

1.13 FACILITY OPERATIONS REQUIREMENTS

The work included in these plans and specifications is to be performed on an existing City facility that must continue in operation during construction. The CONTRACTOR shall cooperate fully at all times with the OWNER and the ARCHITECT/ENGINEER to ensure that any interruption to operations are minimized. Follow the sequence of construction requirements as described elsewhere in these specifications.

1.14 PRIVATE ROADS AND DRIVEWAYS

Bridges at entrances to business properties where vehicular traffic is necessary shall be provided and maintained. Bridges shall be adequate in width and strength for the service required. No private road or driveway may be closed without approval of the ARCHITECT/ENGINEER unless written authority has been given by the owner whose property has been affected. Driveways shall be left open and ready for use at the end of the work shift. All expenses involved in providing for construction, maintenance, and use of private roads or driveways, shall be borne by the CONTRACTOR and the amount thereof absorbed in the unit prices of the CONTRACTOR's bid.

1.15 LIMITS OF THE WORK AND STORAGE OF SPOILS

The limits of the site which may be used for construction, storage, materials handling, parking of vehicles and other operations related to the project include the project site as shown on the drawings and adjacent public rights-of-way subject to permission of the public owner of that right-of-way. The limits of work also include rights of access obtained by the CONTRACTOR, subject to all public laws and regulations and rights of access by utility companies and other holders of easement rights.

1.16 EXISTING WATER SYSTEM SHUTDOWN

If the project involves the need to shut down an existing water system, the CONTRACTOR shall coordinate the work to ensure a minimum shutdown time. The CONTRACTOR shall submit a written shutdown schedule to the OWNER and ARCHITECT/ENGINEER for approval. The CONTRACTOR shall provide 72-hour notice preceding each shutdown. See Technical Specification Section 01010, Summary of Work, for additional requirements.

1.17 FIELD CHANGES, ALIGNMENT AND GRADE

Changes of alignment and grade shall be made during the course of work in order to avoid interference with unforeseen obstructions. The CONTRACTOR shall locate existing utilities to be crossed, by potholing ahead of the pipe installation, of sufficient distance to avoid conflicts through pipe joint deflection if possible. All costs for minor field changes of alignment and grade shall be borne by the CONTRACTOR. The ARCHITECT/ENGINEER will endeavor to make prompt decisions on such matters. CONTRACTOR shall anticipate a minimum of 72 hours for any decision requiring significant piping change.

1.18 TESTING AND OPERATION OF FACILITIES

It is the intent of the OWNER to have a complete and operable facility. All of the work under this contract will be fully tested and inspected in accordance with the specifications. Upon completion of the work, the CONTRACTOR shall operate the completed facilities as required to test the equipment under the direction of the ARCHITECT/ENGINEER. During this period of operation by the CONTRACTOR, the new facilities will be tested thoroughly to determine their acceptance.

1.19 PROTECTION OF EXISTING STRUCTURES AND WORK

The CONTRACTOR must take all precautions and measures necessary to protect all existing structures and work. Any damage to existing structures and work shall be repaired by removing the damaged structure or work, replacing the work and restoring to original condition satisfactory to the ARCHITECT/ENGINEER.

1.20 SALVAGE AND DEBRIS

Unless otherwise indicated on the drawings or in the specifications, all castings, pipe, equipment, demolition debris, spoil or any other discarded material or equipment shall become the property of the CONTRACTOR and shall be disposed of in a manner compliant with applicable Federal State and local laws and regulations governing disposal of such waste products. No burning of debris or any other discarded material will be permitted.

1.21 SAFETY STANDARDS AND ACCIDENT PREVENTION

The CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. The required and/or implied duty of the ARCHITECT/ENGINEER to conduct construction review of the CONTRACTOR's performance does not, and is not intended to, include review of the adequacy of the CONTRACTOR's safety measures in, on, or near the construction site.

The CONTRACTOR shall comply with the safety standards provisions of applicable laws and building and construction codes. The CONTRACTOR shall exercise every precaution at all times for the prevention of accidents and protection of persons, including employees, and property. During the execution of the work the CONTRACTOR shall provide and maintain all guards, railing, lights, warnings, and other protective devices which are required by law or which are reasonably necessary for the protection of persons and property from injury or damage.

1.22 WARRANTY PERIOD

The CONTRACTOR shall warrant all furnished materials and equipment for a period of one year from date of final acceptance of the Work by the OWNER. This warranty shall mean prompt attention to the correction and/or complete replacement of the faulty material or equipment. The expiration of the one-year warranty period shall not affect any other claims or remedy available to the OWNER. There may be other warranty provisions in these contract documents in addition to those noted above.

1.23 UTILITY PROPERTIES AND SERVICE

In areas where the CONTRACTOR's operations are adjacent to or near a utility and such operations may cause damage which might result in significant expense, loss and inconvenience, the operations shall be suspended until all arrangements necessary for the protection thereof have been made by the CONTRACTOR.

The CONTRACTOR shall notify all utility offices which may be affected by the construction operation at least 48 hours in advance. Before exposing any utility, the utility having jurisdiction shall grant permission and may oversee the operation. Should service of any utility be interrupted due to the CONTRACTOR's operation, the proper authority shall be notified immediately. It is of the utmost importance that the CONTRACTOR cooperates with the said authority in restoring the service as promptly as possible. Any costs shall be borne by the CONTRACTOR.

1.24 STREET CLEANUP

The CONTRACTOR shall clean daily all dirt, gravel, construction debris and other foreign material resulting from its operations from all streets and roads.

1.25 VEHICLE PARKING

The vehicles of the CONTRACTOR's and subcontractors' employees shall be parked in accordance with local parking ordinances.

1.26 RECORD DRAWINGS

CONTRACTOR shall maintain at the site one set of specifications, full size drawings, shop drawings, equipment drawings and supplemental drawings which shall be corrected as the work progresses to show all changes made. Drawings shall be available for inspection by the ARCHITECT/ENGINEER. Upon completion of the contract and prior to final payment, specifications and drawings shall be turned over to the ARCHITECT/ENGINEER.

1.27 "OR EQUAL" CLAUSE

In order to establish a basis of quality, certain processes, types of machinery and equipment or kinds of material may be specified on the drawings or herein by designating a

manufacturer's name and referring to its brand or product designation. It is not the intent of these specifications to exclude other processes, equipment or materials of a type and quality equal to those designated. When a manufacturer's name, brand or item designation is given, it shall be understood that the words "or equal" follow such name or designation, whether in fact they do so or not. If the CONTRACTOR desires to furnish items of equipment by manufacturers other than those specified, he shall secure the approval of the ARCHITECT/ENGINEER prior to placing a purchase order.

No extras will be allowed the CONTRACTOR for any changes required to adopt the substitute equipment. Therefore, the CONTRACTOR's proposal for an alternate shall include all costs for any modifications to the drawings, such as structural and foundation changes, additional piping or changes in piping, electrical changes or any other modifications which may be necessary or required for approval and adoption of the proposed alternate equipment. Approval of alternate equipment by the ARCHITECT/ENGINEER before or after bidding does not guarantee or imply that the alternate equipment will fit the design without modifications.

1.28 WORK HOUR LIMITATIONS

All work shall be conducted between the hours of 7:00 a.m. and 6:00 p.m. on non- holiday weekdays only. No weekend work will be allowed. Requests for variations in work hours shall be made in writing for consideration by the ARCHITECT/ENGINEER. No work shall be conducted outside of the above-described days and hours without prior approval of the ARCHITECT/ENGINEER.

1.29 EROSION AND SEDIMENTATION CONTROL

Erosion control measures shall be maintained throughout the project site until approved permanent cover such as a healthy stand of grass, other permanent vegetation, or other ground covering is established. When approved permanent ground cover is established, all temporary erosion control measures shall be removed from the construction site. Erosion control measures shall be installed as approved, per the erosion control drawing(s) in the above referenced document. Erosion control measures including stabilized construction entrances and sediment barriers must be established in conjunction with site clearing and grading.

During construction, and until permanent vegetation or other ground covering is established, the erosion control facilities shall be upgraded as needed for unexpected storm events or site conditions and with the purpose of retaining sediment and sediment-laden water on the construction site.

1.30 INTERFERENCES, OBSTRUCTIONS AND SEWER CROSSINGS

At certain places, power, light and telephone poles may interfere with excavation and the operation of the CONTRACTOR's equipment. Necessary arrangements shall be made with utility companies for moving or maintaining such poles. The utility company affected by any such interferences shall be notified thereof so that the necessary moving or proper care of poles and appurtenances may have appropriate attention.

All costs resulting from any other interferences and obstructions, or the replacement of such, whether or not herein specifically mentioned, shall be included and absorbed in the unit prices of the CONTRACTOR's bid.

1.31 NOISE LIMITATIONS

The project areas are located near a residential zoned area. All applicable City, County ordinances and State and Federal regulations shall be complied with.

1.32 STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. Materials and equipment stored overnight shall be placed neatly on the job site. Unusable materials (i.e. rejected or damaged liner material, old concrete chunks, metal scraps, etc.) shall be expeditiously removed from the job site.
Provide appropriate barricades, signs, and traffic control devices in like-new condition where necessary to protect the public from any hazards associated with the storage of materials and equipment used for this project.
- B. No equipment and/or materials shall be stored outside the immediate work area on public right-of-ways, in the following locations, or in the following manner:
 - 1. In any maintained landscaped or lawn area.
 - 2. In a manner that would totally eliminate an individual residents' street parking.
 - 3. In front of any business.

The "immediate work area" is the area where work is taking place or will be taking place within one calendar day. The CONTRACTOR shall immediately move stored material or equipment which causes a nuisance or creates complaints.

1.33 COMPETENT PERSON DESIGNATION

CONTRACTOR shall designate a qualified and experienced "competent person" at the site whose duties and responsibilities shall include enforcement of Oregon - OSHA regulations regarding excavations, the prevention of accidents, and the maintenance and supervision of construction site safety precautions and programs.

1.34 EMERGENCY MAINTENANCE SUPERVISOR

The CONTRACTOR shall submit to the ARCHITECT/ENGINEER the names, addresses and telephone numbers of at least two employees responsible for performing emergency maintenance and repairs when the CONTRACTOR is not working. These employees shall be designated, in writing by the CONTRACTOR, to act as its representatives and shall have full authority to act on its behalf. At least one of the designated employees shall be available for a telephone call any time an emergency arises.

1.35 PREVAILING WAGE RATES FOR PUBLIC WORKS CONTRACTS IN OREGON

The CONTRACTOR shall abide by ORS 279C.800 through 279C.870 which relate to the prevailing wage rates for the building and construction trades in the State of Oregon. These prevailing wage rates are shown in the Bureau of Labor and Industries document which is referenced elsewhere in these contract documents.

1.36 OREGON PRODUCTS

CONTRACTOR's attention is directed to the provisions of Oregon Law, ORS 279A.120 regarding the preference for products that have been manufactured or produced in Oregon. CONTRACTOR shall use Oregon-produced or manufactured materials with respect to common building materials such as cement, sand, crushed rock, gravel, plaster, etc., and Oregon-manufactured products in all cases where price, fitness, availability and quality are otherwise equal.

1.37 PRE-QUALIFICATION OF CONTRACTORS

Special minimum experience qualifications apply to portions of this project. The Contractor must be qualified by the ARCHITECT/ENGINEER prior to bidding. Only Contractors who have received qualification may be named in the Proposal.

Painting Contractors who desire to be qualified for bidding shall submit a Statement of Qualifications Form (Technical Specification Section 01001) to Laura Terway on the date shown in the Invitation to Bid and on the Form. The ENGINEER will notify any Bidder or Proposer of its decision with respect to the qualification of any such Contractor by addendum issued no later than three days prior to bid opening. Prospective Painting Contractors will not be considered for qualification if the required information is not submitted.

The ENGINEER shall have the right to require a Contractor to clarify any portion of its Statement of Qualifications Form. Response to such a request must be made in writing and shall become a part of the Statement of Qualifications Form. Failure to respond to such a request shall be cause for rejection of the Statement of Qualifications Form. Contractors who have not successfully completed the qualification process as evidenced by the addendum will not be accepted on this project.

END OF SECTION

CONTRACT DOCUMENTS FOR THE CITY OF OREGON CITY COMMUNITY DEVELOPMENT DEPARTMENT

PROJECT SPECIFICATIONS

COMMUNITY DEVELOPMENT DEPARTMENT TI
AT MT. PLEASANT
OREGON CITY, OREGON 97045

PREPARED BY: MATTHEW CRAWFORD

REVIEWED BY: JOELLE HARRIS



October 19, 2017
Job Number: P-2195-17

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DIV 010010

**CONTRACTOR STATEMENT OF QUALIFICATIONS
FORM FOR
CITY OF OREGON CITY COMMUNITY DEVELOPMENT DEPARTMENT
TI MT. PLEASANT ANNEX FOR
THE CITY OF OREGON CITY**

The City of Oregon City requires a statement to be completed and submitted by Contractors bidding on the City of Oregon City Community Development Department TI (Mt. Pleasant Annex) project regarding their financial ability, equipment, and experience in relation to the proposed work. The Contractor must be qualified by the ENGINEER prior to bidding. Only Contractors who have received qualification prior to bidding may be named in the Proposal.

This Statement of Qualifications Form shall be completed and submitted by 3:30 PM on November 2, 2017 to:

Submitted to: City of Oregon City Community Development Department

Address: 221 Molalla Ave, Suite 200, Oregon City, OR 97045

Email Address: Iterway@orc.org

Attention: Laura Terway

To qualify for this project the prospective Contractor must complete the following information:

CONTRACTOR INFORMATION

Submitted By: _____
(CONTRACTOR) A Corporation
A Partnership
An Individual

Type of Work: _____

Principal Office: _____

Contractor's Bank and Local Contact: _____

EXPERIENCE QUESTIONNAIRE

1. The prime contractor should be well established. How many years has your organization been in business as a contractor under your present business name? _____
2. The prime and any subcontractors shall not have failed to complete any work in the past 5 years. Have you ever failed to complete any work awarded to you? _____
If so, where and why? _____

3. The contractor must have successfully completed at least five (5) similar projects within the last five (10) years.

4. List below the contracts which you, or your company, or corporation were party, during the previous 10 years which contracts where involved in litigation of any type:

5. Name the Surety Company, and the name and address of the local agent you expect to use in the event this Contract is awarded to you.

6. A qualified field superintendent will be required to be on the project site in responsible charge, full-time, during all work activities. The proposed superintendent(s) shall be currently employed by the Contractor and shall have been the Contractor superintendent on no less than two (2) projects during the last ten years. Provide the name(s) of at least two (2) projects successfully completed by all of the superintendents listed by the Contractor, which shall include a description, the name and address of the owner, and the approximate completion date. The Contractor superintendent(s) shall have been in the direct employment of the Contractor for both of the projects listed.

Superintendent Name(s)		
Project Completed: Owner Project Name Year Completed		
Project Completed: Owner Project Name Year Completed		

7. List the names, addresses and telephone numbers of the owners and project engineers, and completion dates and location of at least five (5) projects located within the United States which have been successfully constructed by the Contractor during the last ten (10) years. In order to meet the experience requirements, the five (5) projects shall be similar in size and scope to the specified.

Project Name, Owner & Description	Year Completed	Name & Address of Owner Contact Person and Phone Number	Name & Address of Engineer Contact Person and Phone Number

The information submitted in this form will be regarded as confidential to the extent of the law.

The undersigned hereby declares that the foregoing statements are true of said firm.

Dated this _____ day of _____, _____

By _____

Title _____

Date _____

SECTION 010100

WORK BY OWNER, USE OF SITE

1.01 CONTRACTOR AND PREMISES

- A. Contractors are to follow procedures outlined in the "Tenant Improvement Manual", available from Equity Office.
- B. Access to Site: Access to the Site will be limited as provided in any Special Conditions or as otherwise directed by Owner.
- C. Construction Operations: Limited to areas as directed by Owner.
- D. Time Restrictions for Performing Work: In general 7:00 a.m. to 5:30 p.m. or as otherwise provided in any Special Conditions. Other work times are possible with advance notice in writing and approval from the Owner.
- E. Utility Outages and Shutdown: Coordinate with Owner. Give fourteen days written notice before any utility shutdowns.
- F. Coordinate the use of the premises with the Owner. Inform the Architect of such use.
- G. Assume full responsibility for the protection and safekeeping of Products under this Contract, stored on the site.
- H. Move any stored Products, under Contractor's control, which interfere with operations of the Owner or separate contractor.
- I. Obtain and pay for the use of additional storage or work areas needed for operations.
- J. Contractor will notify the Owner, a minimum of 48 hours in advance of performing Work, of work which necessitates closing or interfering with traffic on public thoroughfares, parking areas, and driveways. Contractor will obtain written permission from the Project Manager prior to effecting such closures and interruptions.

END OF SECTION

SECTION 010110

GENERAL REQUIREMENTS

1.01 GENERAL INSTALLION PROVISIONS

- A. Inspection of Conditions: Inspect substrates to receive work and conditions under which the work is to be performed. Report unsatisfactory conditions in writing to the Owner and Architect. Do not proceed with the work until unsatisfactory conditions have been corrected.
- B. Manufacturer's Instructions: Where installations include manufactured products, comply with the manufacturer's applicable instructions and recommendations for installation, to the extent that these instructions and recommendations are more explicit or more stringent than requirements are indicated in the Contract Documents.
- C. Provide attachment and connection devices and methods for securing work. Secure work true to line and level, and within recognized industry tolerances. Allow for expansion and building movement. Provide uniform joint width in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable visual-effect choices to the Owner and Architect for final decision.
- D. Recheck measurements and dimensions of the work, as an integral step of starting each installation.
- E. Coordinate enclosure of the work with required inspections and tests, so as to minimize the necessity of uncovering work for that purpose.
- F. Ensure there are no obstructions to spaces and installations when required to remain clear, in accordance with applicable code requirements.
- G. Ensure piping, wiring, ducts, or other installations are not enclosed until they have been inspected and approved, and required certificates of inspection have been issued.
- H. Mounting Heights: Mount individual units of work to comply with CAC, Title 24 and ADA requirements. Refer questionable mounting height choices to the Owner and Architect for final decision
- I. Ensure anchorage, blocking, joining, and other detailing are provided as required.
- J. Remove and replace work that does not comply with Contract Documents. Repair or replace work or property damaged by construction operations at no increase in Contract Sum.

1.02 SUPERINTENDENT. In addition to requirements of General Requirements of the Contract:

- A. One of General Contractor's Superintendants needs to be present at all times that construction activity is occurring for that floor. The Superintendent shall represent Contractor and all communications given to the Superintendent shall be binding on Contractor.

B. In the event any of the following conditions shall exist, Contractor shall require that a Superintendent be at the Project site not less than ten hours per day, six days per week until the condition no longer exists or the phase is completed:

1. Should any phase not be accomplished in accordance with the Contract Schedule.
2. Should the Contract Schedule indicate in the opinion of Owner's Representative that Contractor is fourteen or more days behind schedule at any time during construction up until thirty days prior to scheduled completion of phase.
3. Should the Contract Schedule indicate, in the opinion of Owner's Representative if the Contractor is seven or more days behind schedule at any time during the last thirty days prior to scheduled completion of a phase.

END OF SECTION

SECTION 010270

APPLICATION FOR PAYMENT

1.01 SUBMITTAL PROCEDURE

- A. Upon Notice of Award of Contract, the Contractor will submit a Schedule of Values within fifteen calendar days. The Schedule of Values shall be in conformance with the CSI format and with subcontract values and Self-Performed Work values delineated and assigned to the appropriate CSI section heading. Obtain approval of the proposed breakdown from the Project Manager prior to submission of the Schedule of Values. The Contractor shall submit, along with this cost breakdown, a cash flow projection of estimated monthly payment amounts that will be incurred over the duration of the project. This information will be used to advise the Owner of the anticipated cost and cash flow for the project.
- B. The cost loaded critical path method Construction Schedule described in detail in Section 013200 – Construction Planning and Scheduling will be the format used and method of payment approval. The updated Construction Schedule must be accepted by Owner before payment will be approved. The following are the criteria for payment approval:
 - 1. 30 days after Notice to Proceed, submit a Schedule of Values based on the Construction Schedule's activity cost loading for each activity of work. Payment will not be made until the Schedule of Values and cost-loaded Construction has been accepted by Owner. The Schedule of Values shall be in conformance with the CSI format and roll up from the cost-loaded Construction Schedule.
 - 2. The Contractor will break out itemized payments for major stored materials as individual activities on the cost-loaded Construction Schedule.
 - 3. A rough draft based on the cost-loaded Construction Schedule will be presented to the Project Manager at the billing meeting on or about the first day of each calendar month.
- C. On or about the first of each month and after the billing meeting with the Project Manager, submit a draft Itemized Application for Payment on copies of the forms provided by the Owner for the Monthly Progress Payment, the Final Monthly Payment, and the Cost Report which will be generated from the Contractor's Construction Schedule Activity Cost Loading. The monthly invoice will be based on work completed through the 25th day of the previous month.
- D. The Application for Payment shall include all of the items listed in Section 010270 of the General Requirements.
- E. Contractor shall provide a monthly allocation of the Contractor's Allowable Costs between General Requirements Expenses, Self-Performed Work and Change Order Work. The allocation shall include a narrative report describing the basis of the allocation. Contractor shall retain for the period required by the General Requirements detailed back-up sufficient to support differentiation of Contractor's certified payroll and other costs between General Requirements Expenses, Self-Performed Work, non-compensable work included in Contractor's Fee and Change Order Work. Contractor shall provide to Owner or Owner's auditor the detailed back-up for the allocation and report upon request.

- F. Using the Monthly Progress Payment and Cost Report, fill in or mark up quantities/percentages/dollars requested, including that of change orders executed prior to the date of submittal of Monthly Progress Payment and Cost Report, and submit to the Project Manager for review. Include such substantiating data as the Project Manager may request. The report shall summarize the value of work completed, broken down according to each of the Specification Divisions as well as by each activity. The stipulated retainage shall be included in the invoice. The Contractor shall provide a sort by CSI format and by building. The Monthly Progress and Cost Report will have the following format:
1. Activity and Specification Division Number.
 2. Cost.
 3. Percent Complete.
 4. Cost of Previous Period
 5. Cost this Period
 6. Total Cost to Date
- G. The Monthly Progress Payment and Cost Report shall be the basis for the updated Schedule of Values. After review and when agreement is reached with the Project Manager on the Progress Payment Estimate, the Contractor shall generate the revised Monthly Progress Payment Application for signature by the Contractor, Project Manager, and the Owner. The Project Manager will make the final determination if agreement cannot be reached on the Contractor's Payment Request. The Project Manager will issue a Certificate for Payment upon conclusion.
- H. The Contractor shall execute certification with signature of a responsible officer of the contractor's firm, as the first signature on the Monthly Progress Report.

1.02 STORED MATERIALS/EQUIPMENT

- A. Payment for stored material and equipment is at the discretion of the Owner. Submit separate schedule of prices of material and equipment to be stored on or off the work site. The schedule will show the quantities, prices, and types of materials to be stored. Stored material prices shall be shown separately on the Cost Loaded CPM based on the Schedule of Prices.
- B. Payment Request may include the value of acceptable material/equipment not yet incorporated into the work, provided that all of the following conditions are met:
1. Payment will only be made for major individual material/equipment, which have a value per item in excess of \$10,000.00.
 2. Such acceptable materials/equipment is either furnished or delivered to the site; or furnished and stored for use on the Contractor's warehouse.
 3. Forty-eight hours prior written approval by the Project Manager shall be obtained for each delivery to the Contractor's warehouse.

4. Title to stockpiled material/equipment shall be vested in the Owner at the time of delivery to the site or warehouse.
5. Stockpiled material/equipment shall be inventoried and accounted for by the Contractor by an independent testing firm and available for inspection by the Owner's authorized agents and shall be physically segregated and marked as the property of Owner.
6. After delivery of the material/equipment, if any inherent or acquired defects are discovered, defective material shall be removed and replaced with suitable material at the Contractor's expense.
7. At his expense, the Contractor shall insure stored material/equipment against theft, fire, vandalism, and malicious mischief and shall deliver the policy or certificate of such insurance to the Project Manager naming the Owner as the insured. Insurance shall not be cancelable for at least 30 days and cancellation shall not be effective until certificate thereof is given to the Owner. Present proof of insurance with each Request for Payment for stored materials.
8. Submit bills of sale or paid invoices for all stored material/equipment on which payment is requested. Payment for stored materials will only be approved for individual major equipment or materials in excess of \$10,000.00.
9. Nothing in the above conditions shall relieve the Contractor of his responsibility for incorporating material/equipment into the work in conformity with the Contract Documents.

1.03 TIMING AND TURNAROUND OF PROGRESS PAYMENTS

- A. The end date for each monthly pay period shall be established as the last day of each month and a formal payment request on or about the 1st of the following month. Certified payrolls and all Construction Schedule update and Schedule of Values update reports will accompany the payment request. Record Documents must be updated continually and current at the time of the payment request. Deducts may be taken for defective work, untimely submittals, stop notices, non-current Record Documents, etc.
- B. It is the intention of the Owner to make progress payments for undisputed items to the Contractor 30 days after receipt of the approved Monthly Progress Payment Application and all backup data including but not limited to payrolls, material inventories, releases of liens, certifications, and invoices.
- C. Final payment shall be in accordance with the Owner-Contractor Agreement and General Requirements after all of the requirements of Specification Section 01750 – Substantial and Final Completion have been met.

END OF SECTION

SECTION 010450
CUTTING AND PATCHING

1.01 SUBMITTALS

- A. Submit written request in advance of cutting or alteration which affects:
 - 1. Structural integrity of any element of Project.
 - 2. Efficiency, maintenance, or safety of any operational element.
- B. Visual qualities of exposed construction elements.
- C. Include in request:
 - 1. Identify the project and number.
 - 2. Location and description of affected work.
 - 3. Necessity for cutting or alteration.
 - 4. Description of proposed work, and products to be used.
 - 5. Alternatives to cutting and patching.
 - 6. Date and time work will be executed.

1.02 MATERIALS

- A. Primary Products: Those required for original installation.
- B. Product Substitution: For any proposed change in materials, submit request for substitution under provisions of Section 01620.

1.03 EXAMINATIONS

- A. Inspect existing conditions prior to commencing Work, including elements subject to damage or movement during cutting and patching.
- B. After uncovering existing work, inspect conditions affecting performance of work.
- C. Beginning of cutting or patching means acceptance of existing conditions.

1.04 PREPARATION

- A. Provide temporary supports to ensure structural integrity of the Work. Provide devices and methods to protect other portions of Project from damage.

- B. Provide 7 days written notice of any disturbance to Owner's ongoing operations.

1.05 CUTTING AND PATCHING

- A. Do not cut structural elements without the express written approval from the Architect unless specifically shown on the drawings. Execute all cutting, fitting, and patching as required to complete work.
- B. Fit products together, to integrate with other work and with workmanlike transitions between existing and new work.
- C. Uncover work to install ill-timed work.
- D. Remove and replace defective or non-conforming work.
- E. Remove samples of installed work for testing when requested.
- F. Provide openings in the work for penetration of mechanical and electrical work.
- G. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
- H. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
- I. Restore work with new products and methods in accordance with requirements of Contract Documents.
- J. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- K. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material to full thickness of the penetrated element.
- L. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
- M. Where existing resilient flooring, carpet and other similar adhesive applied finishes are required to be removed to permit application of new finishes, all adhesives, fasteners, etc., shall be ground, stoned or sanded smooth. Those finishes shall be otherwise removed to the extent that no ridges, lumps or other protrusions will telegraph through surface of new finish. Removal of existing resilient flooring shall be done in a manner described in "Recommended Work Procedures for Resilient Floor Coverings," published by the Resilient Floor Covering Institute, 9686 Hungerford Dr., Suite 12B, Rockville, MD 20850. Do not sand or grind resilient flooring.
- N. Patching and floor leveling: on concrete floors, ARDEX; SD-L, K-15, V-900 or SD-T to best suit application per manufacturers written recommendations.
- O. Where partitions are removed, patch floors, walls, and ceilings, with finish material to match existing. Where removal of partitions results in adjacent spaces becoming one, rework floors and ceilings to provide smooth planes without breaks, steps, or bulkheads.

Where change of plane occurs, request instructions from Architect as to method of making transition.

- P. Trim and refinish existing doors as necessary to clear new floors.
- Q. Patch and replace any portion of an existing finished surface which is found to be damaged, lifted, discolored, or shows other imperfections, with matching material. Provide adequate support of substrate prior to patching the finish. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface. When existing surface finish cannot be matched, refinish entire surface to nearest intersections.
- R. Fill and level damaged finishes, abandoned existing penetrations or depressions resulting from removal of piping, ducting, fixtures, casework, or finishes as required for installation of new finishes with uniform appearances.
- S. Where vapor barrier or membrane under existing slab is disrupted by cutting of slab for new utilities or other purposes, it must be reinstated in a manner satisfactory to the Architect. Provide detail drawing with description of proposed method.
- T. Replace all missing or damaged fire proofing to original thickness to produce the required fire resistance of the construction element.

END OF SECTION

SECTION 011000

SPECIAL TECHNICAL PROVISIONS

PART 1 - GENERAL

These Special Technical Provisions supplement and amplify certain sections of the Standard General Conditions and Supplementary General Conditions. The Standard General Conditions and Supplementary General Conditions shall apply except as modified herein.

These Special Technical Provisions and additional technical specifications may contain occasional requirements not pertinent to the project. However, these specifications shall apply in all particulars insofar as they are applicable to this project.

1.1 APPLICABLE STANDARD SPECIFICATIONS AND PLANS

The current City of Oregon City, Oregon, "Design and Construction Standards/Drawings", (including all revisions at date of bid opening), apply except as may be modified herein. In the case of discrepancy, unless noted otherwise herein, the more restrictive provisions shall apply.

1.2 SCOPE OF WORK

The work to be performed under these specifications and drawings consists of furnishing all labor, materials, services, and equipment necessary to complete construction as described in the specifications and drawings issued by the architect of record.

The above general outline of principal features of the work does not in any way limit the responsibility of the CONTRACTOR(s) to perform all work and furnish all equipment, labor and materials required by the specifications and drawings. The drawings and specifications shall be considered and used together. Anything appearing as a requirement of either shall be accepted as applicable to both even though not so stated therein or shown.

No attempt has been made in these specifications or drawings to segregate work covered by any trade or subcontract under one specification. Such segregation and establishment of subcontract limits will be solely a matter of specific agreement between the CONTRACTOR and its subcontractors and shall not be based upon any inclusion, segregation or arrangement in or of these specifications.

1.3 COORDINATION OF DRAWINGS AND SPECIFICATIONS

The drawings and specifications are intended to describe and provide for a complete work. Any requirement in one is as binding as if stated in all. The CONTRACTOR shall provide any work or materials clearly implied in the Contract Documents even if the Contract Documents do not mention it specifically. If there is a conflict within the Contract Documents, it will be resolved by the following order of precedence:

- A. Permits for outside agencies required by law
- B. OWNER-CONTRACTOR Agreement
- C. Addenda to Contract Documents

- D. CONTRACTOR's Proposal
- E. Special Provisions
- F. Contract Drawings
- G. Technical Specifications
- H. Supplementary General Conditions
- I. General Conditions of the Contract
- J. Standard Specifications
- K. Standard Plans

Dimensions shown on the drawings or that can be computed shall take precedence over scaled dimensions. Notes on drawings are part of the drawings and govern in the order described above. Notes on drawings shall take precedence over drawing details.

The intent of the drawings and specifications is to prescribe the details for the construction and completion of the work which the CONTRACTOR undertakes to perform according to the terms of the Contract. Where the drawings or specifications describe portions of the work in general terms, but details are incomplete or silent, it is understood that only the best general practice is to prevail and that only materials and workmanship of the best quality are to be used. Unless otherwise specified, the CONTRACTOR shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the Contract in a manner satisfactory to the ARCHITECT/ENGINEER.

The contract drawings are designated by general title, sheet number and sheet title. When reference is made to the drawings, the "Sheet Number" of the drawing will be used. Each drawing bears the general title:

CITY OF OREGON CITY
COMMUNITY DEVELOPMENT DEPT. TI

The specific titles of each sheet are contained on A0.0 of Drawings.

1.4 CODE REQUIREMENTS

All work shall be done in strict compliance with the requirements of:

- A. 2014 Oregon Structural Specialty Code
- B. 2014 Oregon Mechanical Specialty Code
- C. 2014 Oregon Plumbing Specialty Code
- D. 2014 Oregon Electrical Specialty Code
- E. 2014 Oregon Energy Efficiency Specialty Code
- F. 2014 Oregon Fire Code
- G. National Electric Code
- H. National Electric Safety Code

- I. Oregon State Department of Labor and Industries
- J. City of Oregon City
- K. Clackamas County
- L. Oregon Department of Environmental Quality

In case of disagreement between codes or these specifications, the more restrictive shall prevail.

1.5 SUBSTANTIAL COMPLETION, FINAL COMPLETION, TIME OF COMPLETION, AND LIQUIDATED DAMAGES

The project shall be at Substantial Completion 114 consecutive calendar days after "Notice to Proceed". For every day after this time limit that the CONTRACTOR has not achieved Substantial Completion, OWNER will assess Liquidated Damages.

The project shall be at Final Completion 128 consecutive calendar days after "Notice to Proceed". For every day after this time limit that the CONTRACTOR has not achieved Final Completion, OWNER will assess Liquidated Damages.

Substantial Completion: As defined in Division 017150, Substantial and Final Completion.

Final Completion: As defined in Division 017150, Substantial and Final Completion.

The CONTRACTOR shall complete all work shown and specified within the time limits stated above and in Section IIIA, Contract Agreement. The written Notice to Proceed will be sent to the CONTRACTOR after the CONTRACTOR submits the signed Contract, Bonds and insurance certificates to the OWNER and those documents have been approved as to form and executed by the OWNER. The CONTRACTOR's attention is directed to Section IIIA, Contract Agreement, and

Section IIIB, Oregon City Public Improvement Standard Conditions, of the Contract Forms as it applies to time of completion and liquidated damages.

1.6 COORDINATION WITH OTHER CONTRACTORS AND WITH OWNER

Certain work within this contract may require connection to and coordination with the work of other contractors and OWNER. The CONTRACTOR under these specifications shall cooperate fully with all other contractors and OWNER and carefully fit its own work to such other work as may be directed by the ARCHITECT/ENGINEER. The CONTRACTOR shall not commit or permit any act to be committed which will interfere with the performance of work by any other contractor or the OWNER.

1.7 NOTIFICATION, EXPEDIENCE, AND ACCESS TO WORK

The CONTRACTOR shall notify the OWNER and ARCHITECT/ ENGINEER a minimum of 48 hours prior to commencing work. The CONTRACTOR shall perform all work in an expeditious manner, minimizing delays and inconvenience to local residents.

Access to the work shall be provided as may be required by the OWNER or its representatives, and all authorized representatives of the state and federal governments and any other agencies having jurisdiction over any phase of the work, for inspection of the progress of the work, the methods of construction or any other required purposes.

1.8 PERMITS AND LICENSES

Unless provided for otherwise in these contract documents, all permits, licenses and fees shall be obtained by the CONTRACTOR and all costs shall be borne by the CONTRACTOR. CONTRACTOR shall pay all plan check fees and other fees necessary to obtain permits and shall accommodate special inspections required thereof. CONTRACTOR shall be responsible for compliance with all permit provisions and shall accommodate all special inspections required thereof, all at no additional expense to the OWNER beyond prices as bid.

1.9 SITE INVESTIGATION AND PHYSICAL DATA

The CONTRACTOR acknowledges that it is satisfied as to the nature and location of the work and the general and local conditions, including but not limited to those bearing upon transportation, disposal, handling and storage of materials, availability of water, roads, groundwater, access to the sites, coordination with other contractors, and conflicts with pipelines, structures and other contractors. Information and data furnished or referred to herein is furnished for information only. Any failure by the CONTRACTOR to become acquainted with the available information and existing conditions will not be a basis for relief from successfully performing the work and will not constitute justification for additional compensation.

The CONTRACTOR shall verify the locations and elevations of existing pipelines, structures, grades and utilities, prior to construction. The OWNER assumes no responsibility for any conclusions or interpretations made by the CONTRACTOR on the basis of the information made available.

1.10 FIELD SERVICE BY MANUFACTURER'S REPRESENTATIVE

The CONTRACTOR shall furnish the services of a manufacturer's or material supplier's representative for all major equipment and materials furnished by the CONTRACTOR or OWNER under this contract, to check, place in operation and test the installation, and train operating personnel. The manufacturer's representative shall be qualified and authorized to perform repairs and maintenance on the equipment.

The above gives a general scope of the services desired from the manufacturer's representative. It will be the responsibility of the CONTRACTOR and the equipment manufacturer to determine detailed requirements. Costs for services of the manufacturer's representative shall be included in the proposal of the CONTRACTOR. The operator training mentioned above shall include sufficient time during the CONTRACTOR's operation and testing period to fully explain to the operating personnel the features of the equipment and maintenance thereof.

1.11 CONSTRUCTION WITHIN PUBLIC RIGHTS-OF-WAY

When the work contemplated is wholly or partly within the right-of-way of a public agency such as a city, county or state, the OWNER will obtain from these agencies any right-of-way and street opening permits and all other necessary permit(s) required for the work. The CONTRACTOR shall abide by all regulations and conditions stipulated in the permit(s). Such conditions and requirements are hereby made a part of these specifications, as fully and completely as though the same were fully set forth herein. The CONTRACTOR shall examine the permit(s) granted to the OWNER by any city, county, state and federal agencies. Failure to do so will not relieve the CONTRACTOR from compliance with the requirements stated therein.

The CONTRACTOR shall obtain all construction permits and pay all fees or charges and furnish any bonds and insurance coverages as necessary to insure that all requirements of the city, county, state or federal agencies will be observed and the roadway and ditches are restored to their original condition or one equally satisfactory. A copy of all permits shall be kept on the work site for use of the ENGINEER.

1.12 CONSTRUCTION WITHIN PRIVATE EASEMENTS

When portions of the work contemplated are within easements held by the OWNER on private property, the CONTRACTOR shall ascertain for itself to what extent the width, status and special conditions attached to easements may have on its operations and all costs resulting therefrom shall be included and absorbed in the unit prices of the CONTRACTOR's bid. CONTRACTOR shall coordinate with private property owners and businesses if required. Landscaping, surface restoration and fence restoration shall be completed within 24 hours following piping and conduit installation and other construction work. Temporary fencing shall be provided continuously until such private fencing is properly restored.

The CONTRACTOR's attention is directed to Paragraph 6.13 of the General Conditions regarding safety and the protection of property. Certain portions of this project may require working in close proximity to existing structures and property within private easements. It is the CONTRACTOR'S responsibility to conduct its operations and limit the size of equipment used in such a manner so as to prevent damage to existing property from excessive vibration or from other direct or indirect CONTRACTOR operations. The cost associated with repairing or replacing property that is damaged by the CONTRACTOR's operations shall be the responsibility of the CONTRACTOR, in accordance with the General Conditions.

1.13 FACILITY OPERATIONS REQUIREMENTS

The work included in these plans and specifications is to be performed on an existing City facility that must continue in operation during construction. The CONTRACTOR shall cooperate fully at all times with the OWNER and the ARCHITECT/ENGINEER to ensure that any interruption to operations are minimized. Follow the sequence of construction requirements as described elsewhere in these specifications.

1.14 PRIVATE ROADS AND DRIVEWAYS

Bridges at entrances to business properties where vehicular traffic is necessary shall be provided and maintained. Bridges shall be adequate in width and strength for the service required. No private road or driveway may be closed without approval of the ARCHITECT/ENGINEER unless written authority has been given by the owner whose property has been affected. Driveways shall be left open and ready for use at the end of the work shift. All expenses involved in providing for construction, maintenance, and use of private roads or driveways, shall be borne by the CONTRACTOR and the amount thereof absorbed in the unit prices of the CONTRACTOR's bid.

1.15 LIMITS OF THE WORK AND STORAGE OF SPOILS

The limits of the site which may be used for construction, storage, materials handling, parking of vehicles and other operations related to the project include the project site as shown on the drawings and adjacent public rights-of-way subject to permission of the public owner of that right-of-way. The limits of work also include rights of access obtained by the CONTRACTOR, subject to all public laws and regulations and rights of access by utility companies and other holders of easement rights.

1.16 EXISTING WATER SYSTEM SHUTDOWN

If the project involves the need to shut down an existing water system, the CONTRACTOR shall coordinate the work to ensure a minimum shutdown time. The CONTRACTOR shall submit a written shutdown schedule to the OWNER and ARCHITECT/ENGINEER for approval. The CONTRACTOR shall provide 72-hour notice preceding each shutdown. See Technical Specification Section 01010, Summary of Work, for additional requirements.

1.17 FIELD CHANGES, ALIGNMENT AND GRADE

Changes of alignment and grade shall be made during the course of work in order to avoid interference with unforeseen obstructions. The CONTRACTOR shall locate existing utilities to be crossed, by potholing ahead of the pipe installation, of sufficient distance to avoid conflicts through pipe joint deflection if possible. All costs for minor field changes of alignment and grade shall be borne by the CONTRACTOR. The ARCHITECT/ENGINEER will endeavor to make prompt decisions on such matters. CONTRACTOR shall anticipate a minimum of 72 hours for any decision requiring significant piping change.

1.18 TESTING AND OPERATION OF FACILITIES

It is the intent of the OWNER to have a complete and operable facility. All of the work under this contract will be fully tested and inspected in accordance with the specifications. Upon completion of the work, the CONTRACTOR shall operate the completed facilities as required to test the equipment under the direction of the ARCHITECT/ENGINEER. During this period of operation by the CONTRACTOR, the new facilities will be tested thoroughly to determine their acceptance.

1.19 PROTECTION OF EXISTING STRUCTURES AND WORK

The CONTRACTOR must take all precautions and measures necessary to protect all existing structures and work. Any damage to existing structures and work shall be repaired by removing the damaged structure or work, replacing the work and restoring to original condition satisfactory to the ARCHITECT/ENGINEER.

1.20 SALVAGE AND DEBRIS

Unless otherwise indicated on the drawings or in the specifications, all castings, pipe, equipment, demolition debris, spoil or any other discarded material or equipment shall become the property of the CONTRACTOR and shall be disposed of in a manner compliant with applicable Federal State and local laws and regulations governing disposal of such waste products. No burning of debris or any other discarded material will be permitted.

1.21 SAFETY STANDARDS AND ACCIDENT PREVENTION

The CONTRACTOR shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. The required and/or implied duty of the ARCHITECT/ENGINEER to conduct construction review of the CONTRACTOR's performance does not, and is not intended to, include review of the adequacy of the CONTRACTOR's safety measures in, on, or near the construction site.

The CONTRACTOR shall comply with the safety standards provisions of applicable laws and building and construction codes. The CONTRACTOR shall exercise every precaution at all times for the prevention of accidents and protection of persons, including employees, and property. During the execution of the work the CONTRACTOR shall provide and maintain all guards, railing, lights, warnings, and other protective devices which are required by law or which are reasonably necessary for the protection of persons and property from injury or damage.

1.22 WARRANTY PERIOD

The CONTRACTOR shall warrant all furnished materials and equipment for a period of one year from date of final acceptance of the Work by the OWNER. This warranty shall mean prompt attention to the correction and/or complete replacement of the faulty material or equipment. The expiration of the one-year warranty period shall not affect any other claims or remedy available to the OWNER. There may be other warranty provisions in these contract documents in addition to those noted above.

1.23 UTILITY PROPERTIES AND SERVICE

In areas where the CONTRACTOR's operations are adjacent to or near a utility and such operations may cause damage which might result in significant expense, loss and inconvenience, the operations shall be suspended until all arrangements necessary for the protection thereof have been made by the CONTRACTOR.

The CONTRACTOR shall notify all utility offices which may be affected by the construction operation at least 48 hours in advance. Before exposing any utility, the utility having jurisdiction shall grant permission and may oversee the operation. Should service of any utility be interrupted due to the CONTRACTOR's operation, the proper authority shall be notified immediately. It is of the utmost importance that the CONTRACTOR cooperates with the said authority in restoring the service as promptly as possible. Any costs shall be borne by the CONTRACTOR.

1.24 STREET CLEANUP

The CONTRACTOR shall clean daily all dirt, gravel, construction debris and other foreign material resulting from its operations from all streets and roads.

1.25 VEHICLE PARKING

The vehicles of the CONTRACTOR's and subcontractors' employees shall be parked in accordance with local parking ordinances.

1.26 RECORD DRAWINGS

CONTRACTOR shall maintain at the site one set of specifications, full size drawings, shop drawings, equipment drawings and supplemental drawings which shall be corrected as the work progresses to show all changes made. Drawings shall be available for inspection by the ARCHITECT/ENGINEER. Upon completion of the contract and prior to final payment, specifications and drawings shall be turned over to the ARCHITECT/ENGINEER.

1.27 "OR EQUAL" CLAUSE

In order to establish a basis of quality, certain processes, types of machinery and equipment or kinds of material may be specified on the drawings or herein by designating a

manufacturer's name and referring to its brand or product designation. It is not the intent of these specifications to exclude other processes, equipment or materials of a type and quality equal to those designated. When a manufacturer's name, brand or item designation is given, it shall be understood that the words "or equal" follow such name or designation, whether in fact they do so or not. If the CONTRACTOR desires to furnish items of equipment by manufacturers other than those specified, he shall secure the approval of the ARCHITECT/ENGINEER prior to placing a purchase order.

No extras will be allowed the CONTRACTOR for any changes required to adopt the substitute equipment. Therefore, the CONTRACTOR's proposal for an alternate shall include all costs for any modifications to the drawings, such as structural and foundation changes, additional piping or changes in piping, electrical changes or any other modifications which may be necessary or required for approval and adoption of the proposed alternate equipment. Approval of alternate equipment by the ARCHITECT/ENGINEER before or after bidding does not guarantee or imply that the alternate equipment will fit the design without modifications.

1.28 WORK HOUR LIMITATIONS

All work shall be conducted between the hours of 7:00 a.m. and 6:00 p.m. on non- holiday weekdays only. No weekend work will be allowed. Requests for variations in work hours shall be made in writing for consideration by the ARCHITECT/ENGINEER. No work shall be conducted outside of the above-described days and hours without prior approval of the ARCHITECT/ENGINEER.

1.29 EROSION AND SEDIMENTATION CONTROL

Erosion control measures shall be maintained throughout the project site until approved permanent cover such as a healthy stand of grass, other permanent vegetation, or other ground covering is established. When approved permanent ground cover is established, all temporary erosion control measures shall be removed from the construction site. Erosion control measures shall be installed as approved, per the erosion control drawing(s) in the above referenced document. Erosion control measures including stabilized construction entrances and sediment barriers must be established in conjunction with site clearing and grading.

During construction, and until permanent vegetation or other ground covering is established, the erosion control facilities shall be upgraded as needed for unexpected storm events or site conditions and with the purpose of retaining sediment and sediment-laden water on the construction site.

1.30 INTERFERENCES, OBSTRUCTIONS AND SEWER CROSSINGS

At certain places, power, light and telephone poles may interfere with excavation and the operation of the CONTRACTOR's equipment. Necessary arrangements shall be made with utility companies for moving or maintaining such poles. The utility company affected by any such interferences shall be notified thereof so that the necessary moving or proper care of poles and appurtenances may have appropriate attention.

All costs resulting from any other interferences and obstructions, or the replacement of such, whether or not herein specifically mentioned, shall be included and absorbed in the unit prices of the CONTRACTOR's bid.

1.31 NOISE LIMITATIONS

The project areas are located near a residential zoned area. All applicable City, County ordinances and State and Federal regulations shall be complied with.

1.32 STORAGE AND PROTECTION OF EQUIPMENT AND MATERIALS

- A. Materials and equipment stored overnight shall be placed neatly on the job site. Unusable materials (i.e. rejected or damaged liner material, old concrete chunks, metal scraps, etc.) shall be expeditiously removed from the job site.
Provide appropriate barricades, signs, and traffic control devices in like-new condition where necessary to protect the public from any hazards associated with the storage of materials and equipment used for this project.
- B. No equipment and/or materials shall be stored outside the immediate work area on public right-of-ways, in the following locations, or in the following manner:
 - 1. In any maintained landscaped or lawn area.
 - 2. In a manner that would totally eliminate an individual residents' street parking.
 - 3. In front of any business.

The "immediate work area" is the area where work is taking place or will be taking place within one calendar day. The CONTRACTOR shall immediately move stored material or equipment which causes a nuisance or creates complaints.

1.33 COMPETENT PERSON DESIGNATION

CONTRACTOR shall designate a qualified and experienced "competent person" at the site whose duties and responsibilities shall include enforcement of Oregon - OSHA regulations regarding excavations, the prevention of accidents, and the maintenance and supervision of construction site safety precautions and programs.

1.34 EMERGENCY MAINTENANCE SUPERVISOR

The CONTRACTOR shall submit to the ARCHITECT/ENGINEER the names, addresses and telephone numbers of at least two employees responsible for performing emergency maintenance and repairs when the CONTRACTOR is not working. These employees shall be designated, in writing by the CONTRACTOR, to act as its representatives and shall have full authority to act on its behalf. At least one of the designated employees shall be available for a telephone call any time an emergency arises.

1.35 PREVAILING WAGE RATES FOR PUBLIC WORKS CONTRACTS IN OREGON

The CONTRACTOR shall abide by ORS 279C.800 through 279C.870 which relate to the prevailing wage rates for the building and construction trades in the State of Oregon. These prevailing wage rates are shown in the Bureau of Labor and Industries document which is referenced elsewhere in these contract documents.

1.36 OREGON PRODUCTS

CONTRACTOR's attention is directed to the provisions of Oregon Law, ORS 279A.120 regarding the preference for products that have been manufactured or produced in Oregon. CONTRACTOR shall use Oregon-produced or manufactured materials with respect to common building materials such as cement, sand, crushed rock, gravel, plaster, etc., and Oregon-manufactured products in all cases where price, fitness, availability and quality are otherwise equal.

1.37 PRE-QUALIFICATION OF CONTRACTORS

Special minimum experience qualifications apply to portions of this project. The Contractor must be qualified by the ARCHITECT/ENGINEER prior to bidding. Only Contractors who have received qualification may be named in the Proposal.

Painting Contractors who desire to be qualified for bidding shall submit a Statement of Qualifications Form (Technical Specification Section 01001) to Laura Terway on the date shown in the Invitation to Bid and on the Form. The ENGINEER will notify any Bidder or Proposer of its decision with respect to the qualification of any such Contractor by addendum issued no later than three days prior to bid opening. Prospective Painting Contractors will not be considered for qualification if the required information is not submitted.

The ENGINEER shall have the right to require a Contractor to clarify any portion of its Statement of Qualifications Form. Response to such a request must be made in writing and shall become a part of the Statement of Qualifications Form. Failure to respond to such a request shall be cause for rejection of the Statement of Qualifications Form. Contractors who have not successfully completed the qualification process as evidenced by the addendum will not be accepted on this project.

END OF SECTION

SECTION 012610

REQUESTS FOR INFORMATION

This procedure will be followed by the Contractor for the documentation of the discovery of any apparent conflicts, omissions, or errors in the Contract Documents, or upon having any questions concerning interpretation of the intent of the Contract Documents. This procedure shall also apply to any requests for substitutions pursuant to General Requirements.

1.01 PROCEDURES

- A. Notification by Contractor: Should the Contractor discover conflicts, omissions, or errors in the contract documents, or have any questions concerning interpretation or clarification of the intent of contract documents, or if it appears to the Contractor that work to be done or any related matter are not sufficiently detailed or explained in the contract documents, then, before proceeding with the work affected, the Contractor shall immediately notify the Architect and Project Manager and request interpretation, clarification, or additional detailed instructions concerning the work. The Contractor shall ask for any clarification or request immediately upon discovery, but no less than seven working days prior to the start date of the activities related to the clarification.
- B. Requests: The contractor shall make any requests for substitution using the procedures specified in this Specification. The request must contain all pertinent information required for the Owner to determine adequacy and merit of the substitution requested. See Section 01620 – Product Options and Substitutions. It should be noted that the Architect/Engineer must use a Request for Information (RFI) form for any change made on a submittal.
- C. Form: The Contractor shall submit all RFI's, requests for clarification and/or additional information through the Project Manager to the Architect/Engineer.
- D. Numbering: Numbering shall be sequential, except for in the re-issuance of a respective RFI in which the subscript a, b, c, etc., will be added until the RFI is resolved.
- E. Distribution: All RFI's will be sent to the Architect/Engineer and if needed his Engineering Consultants. The Architect/Engineer will always be responsible for the response to any RFI distributed to the Architect/Engineer.
- F. Response Time: The Architect/Engineer shall resolve such questions and issue instruction to the Contractor within a reasonable amount of time. The Architect/Engineer shall be given a minimum of seven working days to resolve such questions. The seven (7) working days is calculated from the date that the Architect/Engineer accepts the RFI; to the date the response is transmitted to the next reviewer. The processing time for review of completeness of the question or the response is not included in the seven (7) working day duration. In some cases, this time may need to be lengthened for complex issues. The time may be shortened for emergency situations as mutually agreed upon by the Architect/Engineer, Project Manager, and Contractor.

- G. The Contractor should not start the work associated with the RFI until the RFI is answered and the Contractor understands the answer. Should the Contractor proceed with the work affected before receipt of a response from the Architect, any portion of the work which is not done in accordance with the Architect/Engineer's interpretation, clarifications, instructions, or decisions .The installed work will be subject to removal or replacement at the Contractor's expense and within contract time.
- H. Reason for Submission - The Contractor may submit RFI's if one of the following conditions occurs:
1. The Contractor discovers an unforeseen condition or circumstance that is not described in the contract documents.
 2. The Contractor discovers an apparent conflict or discrepancy between portions of the contract documents and appears to be inconsistent or is not reasonably inferred from the intent of the contract documents.
 3. The Contractor discovers what appears to be an omission from the contract documents that cannot be reasonably inferred from the intent of the contract documents.
 4. The allowable reasons for substitutions as described in General Requirements Section 016200.
- I. Rejections: RFI's will not be recognized or accepted if in the opinion of the Project Manager or Architect/Engineer one of the following conditions exists:
- a. The Contractor submits an RFI as a submittal.
 - b. The Contractor submits the RFI under the pretense of a Contract Documents discrepancy or omission without thoroughly reviewing the documents.
 - c. The Contractor submits the RFI in a manner that suggests that specific portions of the contract documents are interpreted to be excluded or taken as an isolated portion of the Contract Documents in part rather than whole.
 - d. The Contractor submits an RFI in an untimely manner without proper coordination and scheduling of work or related trades.
 - e. The request for substitution does not meet the criteria of the General Requirements.
- J. Subject: Each RFI shall be limited to one subject.
- K. Additional Detailed Instructions (Clarifications): The Owner may furnish additional detailed written instructions to further explain the work, and such instructions shall be a part of the contract documents. Clarifications will be issued using the above RFI system. Should additional detailed instructions, in the opinion of the Contractor, constitute work in excess of the scope of the contract, the Contractor shall submit a written notification no

later than seven (7) calendar days to the Project Manager following receipt of such instruction. In any event, prior to the commencement of work.

- L. The Project Manager will then consider such notice and, if the Project Manager considers the notice justified the instructions of the Owner will be revised or a proposed change order will be issued. The Contractor shall have no claim for additional compensation or extension of the schedule because of any such additional instructions unless the Contractor provides the Project Manager written notice thereof within the time frame specified above. In addition, the Contractor shall within 15 days from the date of notification provide detailed justification and analysis as well as complete pricing and schedule CPM fragmentary network to support any request for time extension.

END OF SECTION

SECTION 013100

COORDINATION

1.01 COORDINATION

- A. Coordinate scheduling, submittals, and Work of the various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- B. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with line of building. Use spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. In finished areas, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean up of Work of separate Sections in preparation for Substantial Completion.
- F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.02 ALTERATION PROJECT PROCEDURES

- A. Materials: As specified in product Sections; match existing products and work for patching and extending work.
- B. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- C. Remove, cut, and patch work in a manner to minimize damage and to provide a means of restoring products and finishes to original and or specified condition.
- D. Refinish visible existing surfaces to remain in renovated rooms and spaces, to specified condition for each material, with a neat transition to adjacent finishes.
- E. Where new work abuts or aligns with existing, perform a smooth and even transition. Patched work shall match existing adjacent work in texture and appearance.
- F. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

- G. Where a change of plane of 1/4-inch or more occurs, submit recommendation for providing a smooth transition for Architect review or request instructions from Architect.
- H. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- I. Finish surfaces as specified in individual product Sections.

END OF SECTION

SECTION 013190
PROJECT MEETINGS

1.01 PRECONSTRUCTION CONFERENCE

- A. The purpose of the meeting will be to introduce the Owner's, Contractor's, and Architect/Engineer's key personnel and to review the contract provisions and any other items pertaining to the project.
- B. Attending shall be:
 - 1. Owner's Representative
 - 2. The Architect/Engineer's Representative
 - 3. The Contractor
 - a. The Contractor's Superintendent
 - b. The Contractor's Project Manager
 - c. Representatives of the major subcontractors
 - d. Others as appropriate and requested by the Architect and/or Owner's Representative
- C. Agenda: The Project Manager will prepare an agenda for the meeting.

1.02 PROGRESS MEETING. Meetings schedule will be determined by the project team.

1.03 BILLING MEETINGS

- A. Each month attend a payment meeting with the Architect and Owner's Representative to agree on the percentage of the work completed up to the 25th day of the current month and establish an amount to be requested in the Application for Payment.
- B. The meeting location shall be at the site.
- C. Attending shall be:
 - 1. Owner's Representatives
 - 2. The Architect
 - 3. The Contractor's Representative.
 - 4. Subcontractors as requested by the Project Manager.

- D. Prepare an itemized draft of the month's proposed billing for review with the Project Manager. This breakdown will be the form generated from the cost loaded schedule in the Primavera's format for billings.
- E. Following review of the proposed billing, prepare an Application for Payment and submit it to the Project Manager not later than the last day of each month.

1.04 SCHEDULE APPROVAL MEETINGS

1.05 PROPOSED CHANGE ORDER MEETING

- A. Each week the Contractor will be available to review the status of Requests for Change, Proposed Change Orders, and Change Orders. In addition, negotiations will take place on all Proposed Change Orders for which the Contractor has supplied detailed back-up materials.
- B. The meeting location shall be determined by the Contractor.
- C. Attending shall be:
 - 1. The Owner's Representatives
 - 2. The Architect
 - 3. The Contractor Cost Engineer and Project Manager
 - 4. Subcontractors, as requested by the Owner

1.06 CONTRACTOR MEETINGS. This section does not limit meetings among the Contractor subcontractors and others as the Contractor deems necessary.

1.07 PRE-INSTALLION CONFERENCES

- A. When required in individual Specification Sections, convene a pre-installation conference at work site before commencing work of the Section
- B. Require attendance of parties directly affecting or affected by work of the specific Section.
- C. Notify the Architect and Owner's Representatives seven days in advance of meeting date.
- D. Make physical arrangements for conference, prepare agenda, preside at conference, record minutes, and distribute copies within two days after conference to the Project Manager, its participants, and those affected by the decisions made at the conference.
- E. Review conditions of installation, preparation and installation procedures, and coordination with related work.

1.08 PRE-SUBSTANTIAL COMPLETION MEETINGS

- A. Thirty days before the estimated substantial completion, hold a meeting to review maintenance manuals, guarantees, close-out submittals, bonds, and service contracts for materials and equipment. Implement repair and replacement of defective items, and extend service and maintenance contracts as desired by the Owner.
- B. The meeting location shall be determined by the Contractor.
- C. Attending shall be:
 - 1. The Owner's Representatives
 - 2. The Architect/Engineer's Representative
 - 3. The Architect/Engineer's professional consultant, as appropriate
 - 4. The Contractor
 - 5. Subcontractors, Suppliers or Others, as appropriate

END OF SECTION

SECTION 013200

CONSTRUCTION PLANNING AND SCHEDULING

1.01 CONSTRUCTION SCHEDULE

A. REQUIREMENTS

1. Submit a preliminary critical path method (CPM) Construction Schedule with cost and man-loading covering the first 90 calendar days of the Contract by the earlier of: (a) within 15 calendar days of the Notice to Proceed; or (b) ten days prior to the date specified for the commencement of construction in Owner's Notice to Proceed.
2. Submit a Construction Schedule for the entire project duration with cost and man-loading no later than 45 calendar days after the Notice to Proceed.

B. PREPARATION GUIDELINES

1. The Construction Schedule shall represent a practical plan to complete the work within the Contract time. The Construction Schedule shall be consistent in every way with the Contractor's Work Plan submitted previously.
2. Have activities with durations of fifteen (15) working days or less and costs of [\$ N/A] or less.. Should an activity require more than fifteen (15) working days or have a cost of more than [\$ N/A], it shall be subdivided to defined activities meeting these time and cost criteria. Longer durations on non-construction activities, including the procurement and fabrication of materials and equipment, may be used if approved by Owner.
3. No more than 15 percent of the activities shall be critical or near critical. Near critical is defined as float in the range of 1 to 5 workdays.
4. The Contractor will provide the necessary crews and manpower to simultaneously meet the schedule requirements for constructing the facility within the contract duration. This may require multiple crews on multiple fronts on multiple critical paths simultaneously. The Contractor will provide manpower and crewing calculations to support the critical path fronts.
5. The Contractor will indicate all submittal review, sample/mockup construction and approval, systems inspection and testing, O&M Manual review, as-built review, training, and punch list activities on the schedule.
6. The Construction Schedule shall clearly show the sequence and interdependence of construction activities, submittals and shall specifically indicate:
 - a. Activities and their interdependency for the submittal sequence, for procurement, delivery, installation, and completion of each major piece of equipment, materials, and other supplies.
 - b. Activities for maintaining Project Record Documents.

- c. Phase and sub-phase work starting and completion.
 - d. Work to the interior and exterior of the existing facility indicating the various activities at each work area.
- 7. The Construction Schedule shall be calendar time-scaled in the form of a precedence diagram
- 8. The activities shall include:
 - a. Description: What is to be accomplished and where.
 - b. Activity ID: The Contractor will develop his own requirements for the construction progress schedule. The activity ID should be the means that the Contractor uses to sort their schedule in the event that they can not come to agreement with Owner's Construction Manager on the coding structure of the overall construction progress schedule.
 - c. Calendar day duration.
 - d. The dollar value for each activity on the Construction Schedule for cash flow planning purposes and on the Schedule of Values for payment purposes (cost loading). The total of activity costs shall equal the Contract amount and be in conformance with the bid proposal.
 - e. The total quantum of manpower (in terms of man-days) assigned to each activity.
 - f. The total number of full-time workers assigned to work on each activity (man loading).

C. ANALYSIS AND UPDATING OF THE SCHEDULE

- 1. Contractor shall provide Owner's Construction Manager with copies of an updated schedule showing work progress. Submittal of the updated schedule shall be attached with the request for payment and will be a condition of monthly payment.
- 2. Revised schedule, other than the preliminary schedule, shall be prepared and submitted under the following conditions:
 - a. When approved changes to the Contract effect Contract completion time.
 - b. When "slippage" occurs because of procurement delays, rains, strikes, and other delays.
 - c. When activities are modified from previous submittal.
 - d. When delay on initial non-critical items is of such magnitude as to change course of critical path.
 - e. Computerized CPM reports will be distributed by the Contractor on a monthly basis as a part of the Application for Payment. The Contractor is responsible for the accuracy of the information contained in the computerized CPM, and subsequent updates of the CPM. Owner's

Construction Manager acts as a data-monitoring agent only for this information. Owner's Construction Manager will not produce computerized CPM schedule drawings. Producing computerized CPM schedule drawings and revisions to schedule drawings is the responsibility of the Contractor.

1.02 ADDITIONAL CONSTRUCTION SCHEDULE REQUIREMENTS

- A. The Construction Schedule must be developed using the knowledge and expertise of a qualified Project Superintendent.
- B. The Construction Schedule must be developed with the direct involvement and input from the Subcontractors that will be working on the project. Their involvement is key to the accuracy of the Construction Schedule. Their integration into the development of the Construction Schedule must include as a minimum:
 - 1. The work activities from each subcontractor's prepared construction schedules.
 - 2. Their activity durations.
 - 3. Their activity relationships to their activities and other subcontractor activities.
 - 4. Cost associated with the activities of the schedule.
 - 5. Manpower associated with the scheduled work activity.
- C. The Contractor shall distribute the Construction Schedule and its updates to the Subcontractors for review and acceptance. Copies of the transmittals to the Subcontractors of the construction progress schedule and its monthly update will be included with the monthly payment application submittal.

1.03 CONSTRUCTION SCHEDULE ACCEPTANCE

- A. If provided in the Owner-Contractor Agreement, the Contractor will be subject to daily liquidated damages for failure to timely deliver a revised Project Construction Schedule acceptable to Owner.
- B. A Construction Schedule extending beyond the Contract time will not be acceptable.
- C. Approval of the Contractor's Construction Schedule, if based on less time than the maximum time allowed, does not serve to change the specified time of completion. Nor does it serve as a waiver of the Contractor's or the Owner's right to the full amount of time specified as the time of completion, unless the time of completion is changed by a formal change order to this Contract. A Construction Schedule showing the work completed in less than the Contract time, which is found practical by the Project Manager, shall be considered to have float. The float is the time between the earlier scheduled completion of the work and the Contract Completion Date. In this case and others, float is a resource available to both the Owner and the Contractor.
- D. Any change in the work, planned restraints, logic, sequence, or timing of work shall be submitted in a written revision to the impacted portion of the CPM drawing by the

Contractor for the Project Manager's approval. Upon approval, the Contractor shall revise the computerized CPM Construction Schedule accordingly.

- E. If, according to the updated CPM Construction Schedule, the Contractor is 30 days or more behind the estimated progress date, considering all approved time extensions, the Contractor shall submit a revised schedule (Recovery Schedule) showing a workable plan to complete the Project on time. The Project Manager may withhold progress payments until the Contractor submits a revised Construction Schedule, acceptable to the Project Manager.
- F. Scheduling of approved changes is the responsibility of the Contractor. The Contractor shall revise the Construction Schedule drawing to incorporate all activities involved in completing the change orders and submit it to the Project Manager for review and approval. The Contractor shall provide a separate fragmentary Schedule for each change indicating the revised activity, whether the change is concurrent or sequential, and the duration of the change and the restraints with his pricing of the change. Failure to request time and/or failure to provide the fragmentary schedule will result in the Contractor waiving his right for additional time.
- G. Construction Manager may find that the Contractor is entitled to an extension of the completion date under the provisions of the Contract. The determination of the total number of days' extension will be based upon the current analysis of the currently accepted monthly update of the Construction Schedule and upon the data relevant to the extension.
- H. Contractor acknowledges and agrees that delays to non-critical activities (those with float) will not be the basis for a time extension. Non-critical activities are those activities which, when delayed, use float and do not affect the final Contract Completion Date.

1.04 SUBMITTALS OF CONSTRUCTION SCHEDULE

All schedule submittals shall include five copies of the CPM for Construction Schedule.

- A. The Contractor's pre-bid schedule with his initial Ninety- (90) day Construction Schedule.
- B. Ninety (90) day Construction Schedule.
- C. Complete cost/ resource loaded Construction Schedule.
- D. Schedule certifications.
- E. Schedule transmittals.
- F. Monthly Construction Schedule updates.
- G. Three (3) -week rolling ("look ahead") schedule.
- H. Detailed Closeout Schedule.
- I. Initial and monthly updates to the Contractor's project directory.

1.05 CLOSEOUT SCHEDULE

- A. Ninety (90) days prior to estimated substantial completion, Contractor will provide a detailed closeout schedule of all activities to be completed including instructions, O&M, testing, training inspection, clean-up, etc.
- B. Ninety (90) days prior to start of the first system test Contractor will provide a detailed schedule for all Division 15, 16, and 17 work performance testing.

1.06 THREE WEEK ROLLING SCHEDULE. The Contractor shall provide a three-week rolling schedule as described in Specification 01319 Project Meetings. The Contractor shall provide sufficient copies for all meeting attendees.

END OF SECTION

SECTION 013300

SUBMITTALS

1.01 SUBMITTAL PROCEDURES.

A. General:

1. Within 30 days after Owner's Notice to Proceed, prepare and submit a prioritized schedule of submittals (including those to be furnished by Owner) which is coordinated and integrated into the Contractor's construction schedule. Such schedule shall advise the Architect as to the latest date the submittal should be returned to the Contractor in order to avoid delay to the work.
2. Architect shall have a reasonable length of time to review shop drawings and submittals as deemed necessary to permit adequate review in the Architect's professional judgment not to exceed 15 business days.
3. Do not schedule submittals out of sequence with the schedule for work except as required for products known to require extraordinary long-lead times between order and delivery. Submittals for long-lead time items shall be accompanied by verification of the required lead-time from the supplier.
4. In order for Architect to make final color selections, Architect must receive all submittals involving color choices, including color samples before starting selection process.
5. Architect's Review: Does not relieve Contractor from responsibility for errors or omissions in the submittals.

B. Transmittals:

1. Transmit each submittal using Architect-accepted form.
2. Sequentially number the transmittal forms. Re-submittals to have original number with an alphabetic suffix.
3. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
4. Apply Contractor's stamp, assigned or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
5. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed work.
6. Deliver to Architect at business address. Coordinate submission of related items.

C. Revise and resubmit submittals as required, identify all changes made since previous submittal.

- D. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.
- E. Partial submittals will not be reviewed. They will be returned.
- F. Commence no portion of the work requiring submittals until the submittal has been reviewed by the Architect.
- G. Provide space for Contractor and Architect review stamps. Allow a 6-inch x 6-inch space for Architect's stamp.

1.02 CONSTRUCTION SCHEDULE

- A. Submit initial Construction Schedule in duplicate within 15 days after date established in Notice to Proceed for Architect's review.
- B. Revise and resubmit as required.
- C. Submit revised schedules with each Application for Payment (at minimum), identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation, identifying first work day of each week.
- E. Show complete sequence of construction by activity, identifying Work of separate stages and other logically grouped activities. Indicate the early and late start, early and late finish, float dates, and duration.
- F. Indicate estimated percentage of completion for each item of Work at each submission.
- G. Indicate submittal dates required for shop drawings, product data, samples, and product delivery dates, including those furnished by Owner and under Allowances.

1.03 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.04 SHOP DRAWINGS

- A. Shop Drawings accepted and reviewed by the Architect are instruments of convenience to further the progress of the work and will become Documents of Record, but are not to be considered as becoming a part of the Contract Documents (except that shop drawings which include required calculations for verification by the Architect, Fire Marshal, or the Owner's Insurance carriers, of life safety concerns, such as for shop drawings submitted for fire sprinkler systems with hydraulic calculations, or structural elements such as prefabricated joist systems, shall become a part of the Contract Documents).

- B. Submit 4 full sized copies that are rolled, not folded.
- C. Identify details on shop drawings by reference to sheet and detail numbers of Contract Drawings and/or specific reference to Sections and Paragraphs of the Specifications.
- D. After review, reproduce and distribute in accordance with Article on Procedures above and for Record Documents described in Section 01715 – Substantial and Final Completion.

1.05 Product Data

- A. Typically submit two copies if not otherwise specified in specific sections. Architect will mark up and make record copies for Architect's use and consultants if required and return marked copy to Contractor.
- B. Identify pertinent materials, products, models, finishes.
- C. Identify standard options included.
- D. Show dimensions and clearances required.
- E. Indicate performance characteristics and capabilities.
- F. Show wiring diagrams and controls and necessary rough-in requirements for utility services and connections where applicable.
- G. Modify standard schematic drawings to delete information which is not applicable and supplement to provide additional information where required.
- H. After review, distribute in accordance with Article on Procedures above and provide copies for Record Documents described in Section 01715 - Substantial and Final Completion.

1.06 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes, textures, and patterns for Architect's selection. Where samples have natural variations in color texture or dimension, submit samples showing the extremes, as well as the middle range.
- C. Include identification on each sample, with full Project information.
- D. Submit the number of samples specified in individual specification Sections, or where number is not specified, provide two samples, one of which will be retained by Architect.
- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.07 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.08 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturers' certificate to Architect for review, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

END OF SECTION

SECTION 014100
REGULATORY REQUIREMENTS

PART 1 -- GENERAL

The work shall comply with all applicable laws, rules and regulations. The following has been compiled for the convenience of the Contractor and Subcontractors but it may not be exhaustive.

1.01 STANDARD SPECIFICATIONS

- A. All materials specified by reference to number, symbol, or title of a specified standard such as a State standard, commercial standard, federal specifications, American Society for Testing Materials, or trade-association standard, or other similar standard shall comply with requirements in the revision thereof and any amendments or supplements thereto in effect on date of execution of the Contract. See Section 01420.
- B. Standard referred to, except as modified herein, shall have full force and effect as though printed in these specifications. These standards are not furnished to the Contractor, since manufacturers and trades involved are assumed to be familiar with their requirements.

1.02 CODES

- A. The Work shall be performed in accordance with Applicable Code Requirements and applicable requirements of State of Oregon, Federal and all other regulatory agencies, including, but not limited to the following:
 - 1. Oregon Structural Specialty Code (OSSC)
 - 2. National Fire Protection Association (NFPA) "Life Safety Code"; NFPA 101 And Others As Adopted By Title 24 Of CCR.
 - 3. Oregon Health And Safety Code
 - 4. Oregon Occupational Safety And Health Act (Cal/OSHA)
 - 5. Federal Occupational Safety And Health Administration (OSHA)
 - 6. Americans With Disabilities Act
 - 7. The Federal Clean Water Act
- B. Conflicts between code requirements, comply with the one establishing the more stringent requirements.
- C. Conflicts between code requirements and Contract Documents, comply with the one establishing the more stringent requirements.

END OF SECTIONS

SECTION 014200

REFERENCE STANDARDS

1.01 DESCRIPTION OF REQUIREMENTS FOR USE OF SCHEDULE

- A. Abbreviations and acronyms used in Contract Documents to identify reference standards. They include but are not necessarily limited to those indicated in the Schedule of References (not all references are necessarily used on this project).
- B. Obtain copies of referenced standards direct from publication source, when needed for proper performance of work, or when Contract Documents require reference to be kept at job site.

1.02 QUALITY ASSURANCE

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified, required by manufacturer, or are required by applicable codes.
- B. Conform to applicable reference standards based on date of Contract Documents. For codes listed on the Drawings, applicable date shall be date shown.

1.03 SCHEDULE OF REFERENCE

ACI	American Concrete Institute P.O. Box 9094 Farmington Hills, MI 48333 www.aci-int.org
ADA	Americans with Disabilities Act c/o Architectural and Transportation Barriers Compliance Board Washington, DC www.usdoj.gov/crt/ada/adahom1.htm
ADC	Air Diffusion Council 104 S. Michigan Ave., Suite 1500 Chicago, IL 60603 www.flexibleduct.org
AGC	Associated General Contractors of America 333 John Carlyle Street, Suite 200 Alexandria, VA 22314 www.agc.org

AIA	American Institute of Architects 1735 New York Avenue, N.W. Washington, DC 20006 www.aiaonline.com
AISC	American Institute of Steel One East Wacker Drive, Suite 3100 Chicago, IL 60601-2001 www.aisc.org
ANSI	American National Standards Institute Construction 1819 L Street NW Washington, DC 20036 www.ansi.org
ARI	Air-Conditioning and Refrigeration Institute 4301 N. Fairfax Drive #425 Arlington, VA 22203 www.ari.org
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers 1791 Tullie Circle, N.E. Atlanta, GA 30329 www.ashrae.org
ASME	American Society of Mechanical Engineers Three Park Ave. NE New York, NY 10016-5990 www.asme.org
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org
AWI	Architectural Woodwork Institute 1952 Isaac Newton Square West Reston, VA 20190 www.awinet.org
AWS	American Welding Society 550 Le Jeune Road, N.W. Miami, FL 33126 www.aws.org
OSSSC	Oregon Structural Building Code P.O. Box 14470 Salem, OR 97309-0404

CRSI	Concrete Reinforcing Steel Institute 933 N. Plum Grove Road Schaumburg, IL 60173 www.crsi.org
DHI	Door and Hardware Institute 14150 Newbrook Drive, Suite 200 Chantilly, VA 20151-2223 www.dhi.org
EJCDC	Engineers' Joint Contract Documents Committee American Consulting Engineers Council 1015 15th Street, N.W. #802 Washington, DC 20005 www.acec.org
FS	Federal Specification General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington, DC 20406 www.gsa.gov/pub/fed-specs.cfm
GA	Gypsum Association 810 First Street NE #510 Washington, DC 20002 www.gypsum.org
HMMA	Hollow Metal Manufacturers Association A Division of NAAMM 8 South Michigan Ave., Suite 1000 Chicago, IL 60603 www.naamm.org/hmma.htm
ICBO	International Conference of Building Officials 5360 S. Workman Mill Road Whittier, CA 90601 www.icbo.org
IEEE	Institute of Electrical and Electronics Engineers 1828 L Street NW, Suite 1202 Washington, DC 20036-5104 www.ieee.org
ML/SFA	Metal Lath/Steel Framing Association A Division of NAAMM 8 South Michigan Ave., Suite 1000 Chicago, IL 60603 www.naamm.org/mlsfa.htm

NEMA	National Electrical Manufacturers' Association 1300 North 17 th Street, Suite 1847 Rosslyn, VA 22209 www.nema.org
NFPA	National Fire Protection Association 1 Batterymarch Park, P.O. Box 9101 Quincy, MA 02269-9101 www.nfpa.org
OSHPD	Office of Statewide Health, Planning and Development 1831 Ninth Street Sacramento, CA 95814-6723 www.oshpd.ca.gov
PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077 www.portcement.org
PS	Product Standard U. S. Department of Commerce Washington, DC 20203
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association 4201 Lafayette Center Drive Chantilly, VA 29802 www.smacna.org
UL	Underwriters' Laboratories, Inc. 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com
Warnock- Hersey	Intertek Testing Services/Warnock-Hersey 2430 Mariner Square Loop #B Alameda, CA 94501 www.warnockhersey.com
WIC	Woodwork Institute of California 4356 Gregory Street Castro Valley, CA 94546 www.wicnet.org

END OF SECTION

SECTION 014500
QUALITY CONTROL

PART 1 -- GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. Testing laboratory services.
- C. Inspection.
- D. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

- A. Section 01420 - Reference Standards.
- B. Section 01330 - Submittals: Submission of Manufacturers' Instructions and Certificates.
- C. Structural Drawings
- D. Mechanical and Plumbing drawings specifications
- E. Electrical drawings and specifications.
- F. Respective Sections of the Specifications requiring tests.

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions and workmanship to produce work of specified quality.
- B. Comply fully with manufacturers' instructions, including recommended steps in the sequence of installation.
- C. If manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for the work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.
- G. Install various parts of the work with tolerance recommended by manufacturer or as specified, shown or directed. When manufacturer's tolerance is not available or applicable, install as suitable for proper operation. Adjust when required to avoid binding or excessively loose fit.

1.04 TESTING LABORATORY SERVICE

- A. Owner will appoint, employ, and pay for services of an independent firm to perform inspection and testing.
- B. The independent firm will perform inspections, tests, and other services specified in individual specification Sections and as required by the Architect.
- C. Reports will be submitted by the independent firm to the Architect, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- D. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage and assistance as requested.
- E. Notify Architect and independent firm 48 hours prior to expected time for operations requiring services.
- F. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

1.05 INSPECTION

- A. Inspector of Record: An Inspector of Record, employed by the Owner, will be assigned to the Work in accordance with the requirements of OSHPD and the OSSC. The Work of the Project shall be subject to the personal continuous observation of the Inspector. Contractor shall provide access to work and furnish the Inspector reasonable facilities for obtaining such information as may be necessary to keep him fully informed of the Work. Inspection of the Work shall not relieve the Contractor from any obligation to fulfill any portion of this Contract.
- B. The Owner will arrange and pay for specialty tests and inspections as required by the OSSC that are shown below. The Specialty Testing Laboratories or individuals shall be selected by the Owner.
 - 1. Concrete Testing.
 - 2. Drilled in concrete anchors.

- C. The contractor is responsible for the timing of scheduling and re-testing of inspections. Tests and inspections shall be coordinated with the Inspector of Record, (IOR) for the timing of the work. Costs for re-testing shall be borne by the Contractor.
- D. The Contractor shall reflect the requirements of TIO Program in the Construction Schedule and the logic of the CPM scheduling.

1.06 REPAIR AND PROTECTION. Upon completion of inspection, testing, sample-taking and similar services performed on the Work, repair damaged work and restore substrates and finishes to eliminate deficiencies, including visual deficiencies.

END OF SECTION

SECTION 015000

CONSTRUCTION FACILITIES AND TEMPORARY CONTROL

1.07 TEMPORARY UTILITIES

- A. All fees, labor, and materials, including temporary equipment and connection thereof, required to provide temporary utility services necessary for maintaining existing services and for execution of Work and tests required in various sections of Specifications shall be furnished by Contractor at Contractor's expense, except where otherwise specified. When notified by the Owner, Contractor shall remove all temporary equipment and connections, and leave premises and existing permanent apparatus in an equivalent condition as existed prior to making temporary connections.
- B. Electricity (for Construction and Testing): Furnish all temporary electrical services. Obtain electricity by connecting to existing SUMC electrical distribution system, except where electricity is used for electrical welding devices and any electrical heating devices providing temporary heat. Electricity is available at no cost to Contractor.
- C. Water (for Construction and Testing): Furnish temporary water services.
 - 1. Obtain water by connecting to SUMC distribution system. Provide required pressure backflow preventer at each connection. Water is available at no cost to Contractor.
 - 2. Maintain connections, pipe fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other waste will be cause for revocation (at Owner's discretion) of use of water from SUMC.
 - 3. Contractor shall be **FULLY RESPONSIBLE** for any loss related to water use or leakage on this project.
- D. Temporary Sanitary Facilities:
 - 1. The Contractor shall provide, pay for, install, and maintain for duration of the Work, portable chemical toilets for construction personnel in compliance with laws and regulations, at locations approved by SUMC.
 - 2. Service, clean daily, and maintain facilities and enclosures.
- E. Temporary Ventilation and Heat:
 - 1. Contractor shall provide, maintain, and pay for temporary ventilation and heat as may be required during construction to maintain adequate environmental conditions on the Project site for storage, application, and drying of installed materials, and protection of materials from damage due to improper temperature and humidity.
 - 2. Provide adequate exhaust fans to create a negative pressure in the enclosed areas for welding, painting and curing of installed materials, to disperse humidity, and to prevent hazardous accumulations of dust, fumes, vapors, or gases. Contractor shall coordinate with SUMC Project Manager the route of the

exhausted air to the building exterior or the connections to the existing building exhaust system.

1.08 TEMPORARY FIRE PROTECTION

- A. Provide and maintain fire extinguishes, fire hoses and other equipment as necessary for proper fire protection during construction.
- B. Provide and maintain portable fire extinguishers throughout the area under construction and in field offices, storage sheds and other temporary structures used for construction. In the area under construction, minimum requirements are: one fire extinguisher for each 3,000 square foot of building floor area and no more than 100-foot maximum travel distance.
- C. Appoint qualified person with authority to maintain fire protection equipment, institute fire prevention measures, and direct the prompt removal of unnecessary combustible materials and waste. Such person shall be responsible for the correct and safe use of soldering on coppers, extension lights, flammable liquids, welding and metal cutting apparatus, wax pots, and other flame tools.
- D. Use special precautions to reduce fire hazard where electric or gas welding or cutting work is done. Cover all hazardous material and electrical wires with blanket.
- E. Store paints, varnishes, volatile oils, and similar combustible materials in a room having good ventilation and containing no other materials, or in metal lockers or metal boxes with self-closing covers. Store gasoline and other volatile flammable liquids in metal barrels well away from structures or other combustible materials.
- F. Smoking shall be prohibited in SUMC.

1.09 HAZADROUS MATERIALS HANDLING

- A. Handling of hazardous materials shall be in accordance with Section 414 of the 2014 Oregon Structural Specialty Code.
- B. Prior to the delivery of any hazardous materials, as defined by the State of Oregon, submit a copy of the Material Safety Data Sheet (MSDS) to SUMC.
- C. Contractor shall make on-site hazard surveillance inspections of construction area, storage, and field office both during and after hours. Submit schedule for approval by the SUMC.

1.10 CONSTRUCTION AIDS

- A. Construction Aids:

1. Materials and installation may be new or used, suitable for the intended purpose, and in conformance with applicable regulatory requirement.
 2. Completely remove construction aids when no longer required.
 3. Clean and repair damages caused by installation or use of construction aids.
 4. Restore permanent facilities used for temporary purposes to condition acceptable to SUMC.
- B. Debris Box: Location of debris boxes shall be determined at Pre-construction meeting. Remove rubbish, waste materials and debris daily.

1.11 ACCESS ROADS AND PARKING AREAS

- A. Access: Access to the job site over existing Campus roads, shall be arranged between Contractor and SUMC Project Manager. SUMC will cooperate in vacating the parking spaces for necessary periods of time to facilitate access for loading and unloading, provided three working days notice is received from the Contractor when requesting a specific period of time for access.
- B. Parking: All parking shall be in accordance with the Project parking plan prepared by the Project Manager. Contractor shall be responsible for and control the parking of its workers and Sub-Contractors' workers. Any parking for Contractors' or Sub-Contractors' workers other than as provided in the parking plan must be approved in writing by the Project Manager.

1.12 TRAFFIC CONTROL

- A. Contractor shall provide and maintain adequate traffic control and flagmen's services at all points where transporting of equipment and materials engaged on the Work regularly enters and exits from the project site.
- B. Take special precautions not to damage the existing statues, sculptures, landscaping and general site improvements along the access route. In case of damage to these items, it shall be Contractor's sole responsibility to restore these items to their original condition without increase in the Contract Sum.

1.13 FIELD OFFICE AND WORK SHED

- A. No additional area is available for field office. Contractor shall utilize the project site for a field office.
- B. Field Office. Contractor shall provide a fully-equipped field office of a size suitable to the Project which shall include telephones, fax machines, computers with high-speed internet access, printers and other normal office equipment.

- C. Contractor is required to provide furniture and office equipment for their own use, and adequate cabinets and files for storage of Contract Documents, Shop Drawings and Samples.
- D. At completion of construction Work, remove all furniture and debris. Clean and wash the office before returning to Owner. If there is any damage during the use of the space for field office, it shall be restored to the original conditions by the Contractor at the Contractor's expense.

1.14 TEMPORARY CONTROL

- A. Cooperation with SUMC personnel is required, and sufficient notice shall be given prior to start of any work which will interfere in any way with the use of the property. Since the Work is to be done in an occupied area, particular care shall be exercised to minimize noise and other disturbances. The Contractor shall coordinate with SUMC Project Manager in advance to obtain approval for the use of noisy equipment.
- B. Prior to proceeding with the Work, the Contractor shall coordinate with SUMC Project Manager in advance to obtain approval for time schedule or time during which noisy activities such as core drilling, concrete cutting, etc. may be permitted.
- C. Contractor shall limit his use of premises for work and storage. No storage of construction materials outside the construction barriers will be permitted. Confirm with SUMC Project Manager for temporary storage for construction materials and equipment outside of construction barriers.

END OF SECTION

SECTION 016200

PRODUCT OPTIONS AND SUBSTITUTIONS

PART 1 -- GENERAL

1.01 REQUIREMENTS INCLUDED. Furnish and install products specified, under options and conditions for substitutions stated in this Section.

1.02 PRODUCTS LIST

- A. Submit five copies of complete list of major products which are proposed for installation.
- B. Tabulate products by Specifications Section number and title.
- C. For products specified only by reference standards, list each such product:
 - 1. Name and address of manufacturer.
 - 2. Trade name.
 - 3. Model or catalog designation.
 - 4. Manufacturer's data:
 - a. Reference standards.
 - b. Performance test data.

1.03 CONTRACTOR'S OPTIONS

- A. For products specified only by reference standards, select product meeting that standard, by any manufacturer.
- B. For products specified by naming several products or manufacturers, select any one of the products and manufacturers named which complies with the Specifications.
- C. For products specified by naming one or more products or manufacturers, submit a request as for substitutions, for any product or manufacturer which is not specifically named.

1.04 SUBSTITUTIONS. Requests for substitutions shall use the same procedures as are used for RFI's. See Section 01261.

- A. Catalog numbers and specific brands or trade names followed by the designation "or accepted equal" are used in conjunction with material and equipment required by the

Specifications to establish the standard of quality, utility, and appearance required. Substitutions which are equal in quality, utility, and appearance to those specified may be accepted subject to the following provisions.

1. All substitutions must be accepted in writing by Architect.
 2. Contractor shall submit to Architect, within Thirty-Five (35) days after the date of commencement specified in the Notice to Proceed, a typewritten list containing a description of each substitute material or equipment.
 - a. After end of that period, request of substitution will be considered only in case of product unavailability or other conditions beyond the control of Contractor.
 - b. Product unavailability shall be verified in writing by manufacturer.
 3. Failure of Contractor to submit proposed substitutions for approval in the manner described above and within the time prescribed shall be sufficient cause for disapproval by the Architect of any substitutions otherwise proposed.
 4. Architect will accept, in writing, proposed substitutions that are in Architect's opinion equal in quality, utility, and appearance to the material or equipment specified.
 5. Such acceptance shall not relieve Contractor from complying with the requirements of the Drawings and Specifications.
 6. Wherever more than one (1) manufacturer's product is specified, the first-named product is the basis for the project design and the use of alternative named manufacturer's products or substitutes may require modifications in the project design and construction. If such alternatives are proposed by Contractor and are favorably reviewed by the Architect, Contractor shall be responsible for all costs of any changes resulting from Contractor's proposed substitutions which affect other parts of the Work or the work of Separate Contractors, including the cost of the Architect's additional services, testing, permits thereby made necessary.
 7. Decision of Architect shall be final. If any proposed substitute is judged by the Architect to be unacceptable, the specified item shall be provided; further submissions will not be allowed, unless directed by the Architect.
 8. If a request for substitution occurs after the 35-day period the substitution may be reviewed at the discretion of Architect; and the costs of such review, as approved by Owner, shall be borne by Contractor and will be deducted from the Contract Sum.
- B. Requests for substitutions will only be considered if the Contractor submits the following:
1. Complete technical data including drawings, performance specifications, samples, and test reports of the article proposed for substitution; and any additional information required by Architect.

2. Complete breakdown of costs, which shall include additional costs and savings generated by the proposed substitution and shall indicate the amount, if any, to be deducted from the Contract Sum if the proposed substitution is accepted.
 3. Statement by the Contractor that the proposed substitution is in full compliance with the requirements of the Contract Documents and Applicable Code Requirement.
 4. List of other trades, if any, which may be affected by the substitution.
 5. If the proposed substitution requires that portions of the Project be redesigned or construction be removed in order to accommodate the substituted item, submit design and engineering calculations prepared by a properly licensed design professional. The Contractor shall bear all costs resulting from the substitution.
- C. Submit separate request for each substitution. Support each request with:
1. Complete data substantiating compliance of proposed substitution with requirements stated in Contract Documents:
 - a. Product identification, including manufacturer's name and address.
 - b. Manufacturer's literature; identify:
 - 1) Products description.
 - 2) Reference standards.
 - 3) Performance and test data.
 - c. Samples, as applicable.
 - d. Name and address of similar projects on which product has been used, and date of each installation.
 2. Itemized comparison of the proposed substitution with product specified; list significant variations.
 3. Data relating to changes in construction schedule.
 4. Any effect of substitution on separate contracts.
 5. List of changes required on other work or products.
 6. Accurate cost data comparing proposed substitution with product specified.
 7. Designation of required license fees or royalties.
 8. Designation of availability of maintenance services, sources of replacement materials.
- D. Substitutions will not be considered for acceptance when:

1. They are indicated or implied on shop drawings or product data submittals without a formal request from Contractor.
 2. They are requested directly by a subcontractor or supplier.
 3. Acceptance will require substantial revision of Contract Documents.
 4. Insufficient information is submitted.
 5. To match existing as designated after a manufacturer or model number.
 6. Architect may reject any substitutions not proposed in the manner and within the time prescribed above.
- E. The 35-day submittal period does not excuse Contractor from completing the Work within the Contract Time or excuse Contractor from paying liquidated damages if Final Completion is delayed.

1.05 CONTRACTOR'S REPRESENTATION. In making a formal request for substitution, Contractor represents that:

- A. They have investigated proposed product and have determined that it is equal to or superior in all respects to that specified.
- B. They will provide same warranties for the substitution as for the product specified.
- C. They will coordinate installation of accepted substitution into the Work and will make such changes as may be required for the Work to be complete in all respects.
- D. They waive claims for additional costs caused by substitution which may subsequently become apparent.

END OF SECTION

SECTION 017150

SUBSTANTIAL AND FINAL COMPLETION

1.06 SUBSTANTIAL COMPLETION

The space may be used for its intended purpose and shall be considered Substantially Complete once the Contractor has completed all of the following items:

- A. Definition of Substantial Completion.
 - 1. The Work is defined as Substantially Complete when the Contractor has completed all of the following items:
 - a. Receives verified reports from the Architect, as well as the Owner, and all other agencies that the space is safe and ready for occupancy.
 - b. Temporary electrical power has been provided to permanent and temporary items requiring power.
 - c. All existing utilities have been rerouted and are in full operation
 - d. Provides specified operation and maintenance manuals so that the Owner can independently operate and maintain the space.
 - e. Protects substantially complete work from damage from remaining construction.
 - f. Receives a Certificate of Substantial Completion, approved by the Owner's Representatives and Architect/Engineer that incorporates a Punch List of Incomplete Work. This Punch List is limited to items that can be accomplished during normal business hours without disrupting or inconveniencing staff and the public.
 - 2. Unless otherwise provided in the Certificate of Substantial Completion, the guarantee period for work covered by the Certificate of Substantial Completion shall commence on the date of Substantial Completion.
 - 3. The guarantee period for equipment and systems in each phase will begin on the date of acceptance by the Owner of that piece of equipment or system.
- B. Preparation for Substantial Completion. Submit the following items to the Owner's Representative and Architect with the request for an inspection to certify substantial completion for any phase of work:
 - 1. A status report of the work-in-place at the time of the contractor's inspection request including a forecast of work to be completed before substantial completion and work to be included on the Punch List. This status report shall be in a format acceptable to the Architect and serves as the basis for the Punch List.

2. Documents from the building inspection and fire departments signifying their approval for occupancy or completion as appropriate.

The Architect will review the aforementioned documents and conduct a cursory inspection of the work to determine if the project is ready for the Owner and Architect/Engineer's inspection.

If the work is sufficiently complete, the Owner's Representatives and Architect/Engineer will inspect the work and accept the Contractor's Punch List, or amend the Punch List as necessary to certify the work as Substantially Complete.

C. Pre-warranty Issues:

1. Additional Punch List items discovered after Substantial Completion and prior to Final Completion and acceptance shall be reported to the Contractor using a procedure similar to that used for the warranty.
2. The Contractor shall continuously update progress toward completion of the Punch List.

D. Final Completion;

1. When the work is complete and ready for final inspection, the Contractor shall submit the following information:
2. A certification that the work has been inspected by the Contractor and completed in accordance with the Contract Documents.
3. A copy of the Punch List indicating completion of all work certified to be accurate by a senior executive of Contractor.

1.07 FINAL COMPLETION AND CLOSEOUT/ACCEPTANCE. Prior to acceptance by the Owner, the Contractor shall:

- A. Submit a final statement of cost to the Architect. Final statement shall reflect all adjustments to the Contract Sum:
1. The original Contract Sum.
 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Deductions for uncorrected Work.
 - c. Documents for liquidated damages.
 - d. Other adjustments.
 3. Total Contract Sum, as adjusted.

4. Previous Payments.
 5. Sum remaining due.
 6. The Architect will prepare a final Modification reflecting approved adjustments to the Contract Sum which were not previously made by change orders.
- B. Submit warranties, maintenance agreements, final certifications, and similar documents required by the Contract Documents.
 - C. Submit a certification from Contractor that all training of SUMC maintenance personnel in accordance with Specification 01770 has been completed.
 - D. Submit a certificate of insurance evidencing and confirming that the products and completed operations insurance prescribed in General Requirements shall be in force for a period of three years following completion of the Work.
 - E. Obtain and submit releases enabling the Owner's full and unrestricted use of the work and access to services and utilities, including where required occupancy permits, operating certificates, and similar releases. Provide all release of liens and claims from subcontractors and suppliers. List all outstanding claim issues that will be litigated (see below).
 - F. Submit the written consent of the surety or sureties, if any, to final payment;
 - G. Submit final Record Documents, maintenance manuals, damage or settlement surveys, property surveys, and similar final record information as required by the Contract Documents and approved by the Architect and the Project Manager.
 - H. Contractor expressly acknowledges and agrees that the Record Documents and operations manuals have a value in excess of the amount of the retention, and that it shall not be entitled to receive the retention until such items have been submitted to and approved by the Architect and the Project Manager.
 - I. Deliver tools, spare parts, extra stocks of materials, and similar physical items to the Project Manager.
 - J. Make final change-over of locks and forward keys to the Project Manager.
 - K. Remove all temporary facilities and services, along with construction tools and equipment, mock-ups, and similar elements.
 - L. The Contractor shall provide a final completion report, which shall consist of the following:
 1. A summary time analysis providing a justification for any time extensions being requested which have not been approved.
 2. A summary of all potential claims from the Contractor against the Owner. Attach copies of all claims made to date and any new claims which are being submitted.
 3. A copy of all Record Documents and/or transmittals of Record Documents previously submitted.

4. A copy of operation and maintenance manuals and/or transmittals of operation and maintenance manuals previously provided.
 5. A copy of all training information and information stating dates training was provided to the Owner.
 6. All materials, parts, and keys and/or a copy of transmittals of items previously provided to the Owner.
 7. A summary of all change requests, which the Contractor believes are outstanding and are not included in the aforementioned claims.
 8. A complete release of all liens from the subcontractors and suppliers.
 9. Contractor's request for final payment.
 10. Additional copies of all warranties and guarantees.
 11. Documents confirming all final testing and start-up operations, which were conducted.
- M. Prepare final Application for Payment in accordance with the General Requirements and these Specifications.

1.08 FINAL PAYMENT

After the Owner has accepted the work and recorded the Notice of Completion, the final payment will be made within forty five (45) days after the recording of the Notice of Completion. Acceptance of final payment by the Contractor shall constitute a waiver of all claims, except those previously made in writing and identified by the Contractor as unsettled at the time of final application for payment.

END OF SECTION

SECTION 017500

CLEANING

PART 1 -- GENERAL

1.01 REQUIREMENTS INCLUDED

- A. Execute cleaning during progress of the Work to prevent accumulation of dust and debris.
- B. Execute final cleaning as required in the General Requirements and as specified hereinafter.
- C. Cleaning for specific products or Work is specified in the appropriate individual Specification SECTIONS.

1.02 DISPOSAL REQUIREMENTS. Conduct cleaning and disposal operations to comply with codes, rules and regulations.

PART 2 -- PRODUCTS

MATERIALS. Use only those cleaning materials which will not create hazards to health or property and will not damage surfaces, and are recommended by manufacturer of the surface materials to be cleaned.

PART 3 -- EXECUTION

3.01 DUST CONTROL

- A. Clean interior space prior to the start of finish painting, and continue cleaning on as-needed basis until painting is finished.

3.02 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the Work and the site free from accumulations of waste materials, rubbish, dirt, and tracked debris resulting from construction operations.
- B. Construction operations shall allow for the use of the Gym.
- C. Provide on-site containers for the collection of waste materials, debris, and rubbish.

- D. Promptly remove from site all demolished materials, debris, and rubbish from the site daily in a neat, orderly manner, and dispose of at legal disposal areas away from site. Burning on the site is prohibited.

3.03 FINAL CLEANING

- A. Remove grease, mastic, adhesive, dust, dirt, stains, fingerprints, labels, and other foreign materials from sight-exposed surfaces.
- B. Wash and shine glazing and mirrors.
- C. Polish glossy surfaces to clear shine.
- D. Wash and wax all floor finishes and per manufacturer's recommendation. Wash all floors thoroughly prior to the wax.
- E. Vacuum all carpets.
- F. Ventilating Systems:
 - 1. Clean permanent filters, and replace disposable filters if units have been operated during construction.
 - 2. Clean ducts, blowers and coils if units have been operated during construction.
- G. Wipe surfaces of mechanical and electrical equipment clean. Remove excess lubrication and other substances. Clean light fixtures and lamps.
- H. Disinfect, clean and polish all plumbing fixtures.
- I. Prior to final completion, Contractor shall conduct an inspection of sight-exposed interior and exterior surfaces and all Work areas to verify that the entire Work is cleaned.

END OF SECTION

SECTION 017700

TRAINING OF MAINTENANCE PERSONNEL

PART 1 -- GENERAL

1.01 TRAINING OF MAINTENANCE PERSONNEL

- A. Informal Walk-Through During Construction: In latter stage of construction, maintenance personnel shall, as deemed advisable, meet with the Contractor, and appropriate subcontractor foremen at jobsite to observe portions of the project concerning their trades, and to familiarize themselves with construction details before they are closed in. A copy of each monthly Major Project Construction Report will be forwarded to Maintenance Customer Service to keep Operations and Maintenance (O&M) informed of the progress of construction for the project. During informal walk-through, the Contractor shall identify any areas that might be difficult to reach, or access after portions of the building are closed in; and other possible maintenance problems.
- B. Training Walk-Through: After Architect's observation and walk-through for purposes of issuing a Certificate of Substantial Completion, a training walk-through will be scheduled by the SUMC Project Manager. Attendees shall include Owner's Representative, Architect; Consultants; Contractor; Contractor's Superintendent; Mechanical, Plumbing and Electrical Subcontractors; Ferry Building maintenance personnel; and Building Representative. Copies of the operating manuals will be provided, and after the walk-through, a form letter addressed to Work Information Center will be presented, turning the building over for maintenance as of a specific date, with such exceptions as may be noted in the Certificate of Substantial Completion.

1.02 PROJECT CLOSEOUTS SUBMITTALS

- A. Upon acceptance of the Work by the Architect, and prior to final payment and before Architect issues a Final Certificate for Payment issued in accordance with the General Requirements, the following shall be submitted as directed by Architect:
 - 1. Keys in accordance with requirement of Section 08710.
 - 2. Guarantee and equipment warranties as required by the Contract Documents.
 - 3. Evidence of Payment and Release of Liens in accordance with the Agreement and General Requirements.
 - 4. Maintenance Material (Extra Stock).

END OF SECTION

SECTION 017800

GUARANTEES, WARRANTIES, BONDS SERVICE AND MAINTENANCE CONTRACTS

1.01 GENERAL. Guarantees from Subcontractors shall not limit Contractor's warranties and guarantees to the City. Whenever possible, Contractor shall cause warranties of Subcontractors to be made directly to the City. If such warranties are made to Contractor, Contractor shall assign such warranties to Owner prior to final payment.

1.02 SUBMITTAL REQUIREMENTS

- A. Assemble required guarantees, bonds, and service and maintenance contracts from subcontractor, suppliers and manufacturers.
- B. Number of original signed copies required: 2 each.
- C. Table of Contents: Neatly typed and in orderly sequence. Provide complete information for each item as follows:
 - 1. Product or Work item.
 - 2. Firm name, address, and telephone number; and name of principal.
 - 3. Scope.
 - 4. Date of beginning of guarantee, bond, or service and maintenance contract.
 - 5. Duration of guarantee, bond, or service and maintenance contract.
 - 6. Contractor's name, address, and telephone number; and name of principal.
 - 7. Provide information for Owner's personnel:
 - a. Proper procedure in case of failure.
 - b. Circumstances which might affect the validity of guarantee or bond.

1.03 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.
- B. Format:
 - 1. Size 8 1/2-inch x 11-inch sheets punched for 3-ring binder. Fold larger sheets to fit into binders.

2. Identify each packet on the cover with typed or printed title, "GUARANTEES AND BONDS," and the following:
 - a. Title of Project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.
- D. Disks: Two sets of DVDs with all Submittals included in a common document retention format such as portable document format or ".pdf."

1.04 TIME OF SUBMITTALS

- A. Within 10 days after date of Substantial Completion, prior to Request for Final Application for Payment, submit to the City's Representative.
- B. For Work activities, where Final Completion is delayed materially beyond the date of Substantial Completion, provide updated submittal within 10 days after Final Completion, listing the date of Final Completion as the start of the Guarantee To Repair Period.

1.05 FORM OF GUARANTEE

Submit the following written Guarantee, typed on the Subcontractor's letterhead, when required by a Specification Section:

Date:

Project No.

Project Name:

Project Location:

GUARANTEE FOR (the "Contract"), between the ("Meritage Group") and
_____ the ("Contractor")

_____ (Name of Contractor) or (Subcontractor)

hereby guarantees to the Meritage group that the portion of the work described as follows:

_____, which it has provided for the
above referenced Project, is of good quality; free from defects; free from any liens, claims, and security interests; and has been completed in accordance with specification SECTION and the other requirements of the Contract.

The undersigned further agrees that, if at any time within _____ months after the date of the guarantee the undersigned receives notice from the City that the aforesaid portion of the Work is unsatisfactory, faulty, deficient, incomplete, or not in conformance with the requirements of the Contract, the undersigned will, within ten (10) calendar days after receipt of such notice, correct, repair, or replace such portion of the Work, together with any other parts of the Work and any other property which is damaged or destroyed as a result of such defective portion of the Work or the correction, repair, or replacement thereof; and that it shall diligently and continuously prosecute such correction, repair, or replacement to completion.

In the event the undersigned fails to commence such correction, repair, or replacement within ten

(10) calendar days after such notice, or to diligently and continuously prosecute the same to completion, the undersigned, collectively and separately, do hereby authorize the City to undertake such correction, repair, or replacement at the expense of the undersigned; and Contractor will pay to the City promptly upon demand all costs and expenses incurred by the Owner in connection therewith.

1. SUBCONTRACTOR

Signed: _____ Title: _____
 Typed Name: _____
 Name of Firm: _____
 Type of Work: _____
 Contractor License Classification and License No. _____
 Address: _____
 Phone Number: _____

2. CONTRACTOR

Signed: _____ Title: _____
 Typed Name: _____
 Name of Firm: _____

END OF SECTION

SECTION 024119

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
- B. Related Requirements:
 - 1. Division 01 Section "Construction Waste Management".

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.

1.6 SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

- A. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- B. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- C. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs of conditions that might be misconstrued as damage caused by salvage operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
6. Dispose of demolished items and materials promptly. Comply with requirements in Division 01 Section "Construction Waste Management."

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 1. Do not allow demolished materials to accumulate on-site.
 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 3. Comply with requirements specified in Division 01 Section "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

3.6 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provision of the contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - a. Structural dimension lumber framing.
 - b. Exposed timber structural framing.
 - c. Non-structural dimension lumber framing.
 - d. Sheathing.
 - e. Preservative treated wood materials.
 - f. Miscellaneous framing and sheathing.
 - g. Concealed wood blocking, nailers, and supports.

1.2 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.
- B. AWPA U1 - Use Category System: User Specification for Treated Wood; 2012.
- C. PS 1 - Structural Plywood; 2009.
- D. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.
- E. PS 20 - American Softwood Lumber Standard; 2010.
- F. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2004, and supplements.

1.3 SUBMITTALS

- A. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

1.5 WARRANTY

- A. Correct defective Work within a one year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Douglas Fir-Larch, unless otherwise indicated.
 - 2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
 - 3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.2 DIMENSION LUMBER

- A. Grading Agency: West Coast Lumber Inspection Bureau (WCLIB).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: Kiln-dry or MC15.
- D. Stud Framing (2 by 2 through 2 by 6):
 - 1. Species: Douglas Fir-Larch.
 - 2. Grade: No. 2.
- E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
 - 1. Species: Douglas Fir-Larch.
 - 2. Grade: No. 2.
- F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.3 CONSTRUCTION PANELS

- A. Wall Sheathing: Any PS 2 type.
 - 1. Bond Classification: Exterior.
 - 2. Grade: Structural I Sheathing.
 - 3. Span Rating: 24.
- B. Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I.
- C. Wall Sheathing: Oriented strand board wood structural panel; PS 2.
 - 1. Bond Classification: Exposure 1.
 - 2. Edges: Square.

2.4 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 - 2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
 - 3. Lag Bolts: ASME B18.2.1.
 - 4. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
 - 5. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below

with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

- a. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2.5 FACTORY WOOD TREATMENT

- A. Treated Lumber and Plywood: Comply with requirements of AWWA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
 1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWWA standards.
- B. Preservative Treatment:
 1. Preservative Pressure Treatment of Lumber Above Grade: AWWA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
 - a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
 - b. Treat lumber exposed to weather.
 - c. Treat lumber in contact with roofing, flashing, or waterproofing.
 - d. Treat lumber in contact with masonry or concrete.
 - e. Treat lumber in other locations as indicated.

PART 3 EXECUTION

3.1 PREPARATION

- A. Coordinate installation of rough carpentry members specified in other sections.

3.2 INSTALLATION -GENERAL

- A. Select material sizes to minimize waste.
- B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.
- C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.3 FRAMING INSTALLATION

- A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.
- B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.
- C. Install structural members full length without splices unless otherwise specifically detailed.
- D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes.
- E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.
- G. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.4 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- E. Provide the following specific non-structural framing and blocking:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets.
 - 3. Wall-mounted door stops.
 - 4. Whiteboards and bulletin boards.
 - 5. Wall paneling and trim.
 - 6. Joints of rigid wall coverings that occur between studs.

3.5 ROOF-RELATED CARPENTRY

- A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.6 INSTALLATION OF CONSTRUCTION PANELS

- A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails.

3.7 CLEANING

- A. Waste Disposal: Comply with the requirements of Section 017419 - Construction Waste Management and Disposal.
 - 1. Comply with applicable regulations.
 - 2. Do not burn scrap on project site.
 - 3. Do not burn scraps that have been pressure treated.
 - 4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or "waste-to-energy" facilities.
- B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.
- C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 061800

GLUED-LAMINATED CONSTRUCTION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provision of the Contract, including the General and Supplementary Conditions and Division 01 Specification Sections, Apply to this Section.

1.2 SUMMARY

- A. Glue laminated wood beams.

1.3 REFERENCE STANDARDS

- A. AITC 117 - Standard Specifications for Structural Glued Laminated Timber of Softwood Species; 2010.
- B. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2004, and supplements.

1.4 SUBMITTALS

- A. Product Data: Provide technical data on wood preservative materials, application technique and resultant performance information.
- B. Shop Drawings: Indicate framing system, sizes and spacing of members, loads and cambers, bearing and anchor details, bridging and bracing, framed openings.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect members to AITC requirements for individually wrapped.
- B. Leave individual wrapping in place until finishing occurs.

PART 2 PRODUCTS

2.1 GLUED-LAMINATED UNITS

- A. Glued-Laminated Units: Fabricate in accordance with AITC 117 Industrial grade.
 - 1. Verify dimensions and site conditions prior to fabrication.
 - 2. Cut and fit members accurately to length to achieve tight joint fit.
 - 3. Fabricate member with camber built in.
 - 4. Do not splice or join members in locations other than those indicated without permission.
 - 5.

2.2 FABRICATION

- A. Fabricate glue laminated structural members in accordance with AITC Industrial grade.
- B. Verify dimensions and site conditions prior to fabrication.
- C. Cut and fit members accurately to length to achieve tight joint fit.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that supports are ready to receive units.

3.2 ERECTION

- A. Lift members using protective straps to prevent visible damage.
- B. Set structural members level and plumb, in correct positions or sloped where indicated.
- C. Provide temporary bracing and anchorage to hold members in place until permanently secured.

END OF SECTION

SECTION 064116

PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provision of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section

1.2 SUMMARY

- A. Work Included:
 - 1. Wood veneered office fronts.
 - 2. Wood veneered and painted MDF base.
 - 3. Wood veneered millwork:
 - a. Kitchen and coffee bar cabinetry
 - b. Toilet room cabinetry
 - c. Banquettes
 - d. A/V cabinetry where noted on drawings.
 - e. Cubbies and towel service in gym
 - 4. Plastic laminated cabinets.
 - 5. Wood handrails
 - 6. Wood reception desk
 - 7. Wood ceilings.
 - 8. Wood stair skirt
 - 9. Wood cladding at privacy screens
- B. Work Specified Elsewhere:
 - 1. Stone Assemblies: 044000
 - 2. Solid Surfacing Fabrications: Section 066116
 - 3. Joint Sealants: Section 079200.
 - 4. Wood Doors: 081416
 - 5. Glazing: Section 088000.

1.3 REFERENCES

- A. General: Comply with the applicable provisions of the referenced standards, except as modified by governing codes and the Contract Documents. Where a recommendation occurs in the referenced standards, it shall be considered mandatory. In the event of conflict, the more stringent requirement shall govern.
 - 1. American National Standards Institute (ANSI):
 - a. ANSI A208.2 "Standard for Medium Density Fiberboard".
 - b. ANSI Z124.3 "Standard for Plastic Lavatories".
 - 2. American Society for Testing and Materials (ASTM): E84, "Surface Burning

3. Architectural Woodwork Standards (AWS)
4. The Engineered Wood Association (APA) "Engineered Wood Construction Guide for Residential and Commercial Construction".
5. Forest Stewardship Council (FSC): "FSC-STD-01-001 "Principles and Criteria for Forest Stewardship".
6. National Electrical Manufacturer's Association (NEMA): LD3, "High Pressure Decorative Laminates".
7. National Lumber Grades Authority (NLGA)
8. West Coast Lumber Inspection Bureau (WCLIB)
9. Western Woods Product Association (WWPA)

1.3 DEFINITIONS

- A. The following definitions shall apply to the Work of this Section and modify the Woodwork Institute (WI): "Manual of Millwork" requirements:
 1. Exposed Parts:
 - a. Surfaces visible when:
 - 1) Drawer fronts and doors are closed.
 - 1) Cabinets and shelving are open-type or behind clear glass doors.
 - 2) Bottoms of cabinets are seen 42 inches or more above finished floor.
 - 3) Tops of cabinets are seen below 78 inches above finish floor, or are visible from an upper floor or staircase after installation.
 - 4) Portions of cabinets visible when fixed appliances or equipment are installed.
 - b. Front edges of cabinet body members.
 - c. Interior face of doors and drawer fronts.
 2. Semi-exposed Parts:
 - a. Surfaces visible when:
 - 1) Drawers doors are in open position.
 - 2) Bottoms of cabinets are between 24 inches and up to 42 inches above finish floor.
 - b. All front edges of shelving behind doors.
 3. Concealed Surfaces: Surfaces are concealed when:
 - a. Surfaces are not visible after installation.
 - b. Bottom of cabinets are less than 24 inches above finish floors.
 - c. Tops of cabinets are over 78 inches above finish floor and are not visible from an upper level or staircase.
 - d. Stretchers, blocking, and/or components are concealed by drawers

1.4 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating each specified requirement.
- B. Shop Drawings: Submit for Architect's action. Prepare details at a scale not less

than 3 in. = 1 ft. Coordinate shop drawings with assemblies in Work Specified Elsewhere.

1. Indicate materials, assembly methods, joint details, fastening methods, accessory listings, location of hardware, and schedule of finishes for each casework item.
2. Show mechanical, electrical, and building items in and adjacent to casework.
3. Show locations and type of blocking and other anchors to be built into substrates.

D. Samples: Submit for Architect's action. Label samples to indicate product, characteristics, and location in the Work. Samples will be reviewed for color and appearance only. Furnish sufficient samples to establish the full range of colors and textures for materials exposed in the finished work. Compliance with other requirements is the responsibility of the Contractor.

1. Plastic laminate: 12 in. (300mm) square. Submit each color, pattern and finish.
2. Wood Veneers: Laminated to MDF, minimum 12 in. [300 mm] square. Submit each specified finish and cut, including veneer laminated to substrate. Sample shall include one face veneer seam and reveal detail. Finish sample with specified finish.
3. Painted MDF Bases: 12 in. long by actual width/height. Submit one painted sample of a base.
4. Wood ceilings: corner sample large enough to include equipment trough, full acoustic panel, and edge pocket. Include attachment to building substrate.
5. Wood handrail: 12 in. long finished rail section, including attachment to glass guardrail.
6. Cabinet hardware exposed in the finished work and other type hardware as requested.

E. Quality Assurance/Quality Control Submittals: Submit for Architect's information.

1. Certificates:
 - a. Installer's Qualifications.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Firm specializing in quality architectural cabinetwork.
1. Casework of the Section shall be fabricated by a single firm.
 2. Fabricators no active members of WI will be considered upon submission of verifiable evidence of experience in successful completion of work similar to work of this Project. This provision does not waive compliance with specified WI certification.
- B. Hardwood lumber and veneers shall be harvested from "certified" sustainably managed forest sources. Documentation of each source of hardwood lumber shall be submitted for review prior to fabrication. Lumber veneers for which acceptable documentation is not submitted may be rejected.
1. "Sustainably managed" shall mean, in addition to other considerations, forests that are being managed through a professionally administered forestry management plan in which timber growth equals or exceeds

- harvesting rates in both quality and quantity.
- 2. Acceptable certifiers shall be the Smart Wood program administered by the Rainforest Alliance, the Forest Conservation program administered by Scientific Certification Systems or a Forest Stewardship Council accredited equivalent.
- C. Coordinate with other Sections for visual match with other Project woodwork.
- D. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs). Obtain necessary approvals from AHJs.
- D. Visual Mock-Up: Provide a visual mock-up at the project site of office front for review by the Architect. Extent of mock-up is shown on the drawings. Mock-up may be installed in final location and if accepted by Architect, may be utilized in the finished work.

1.6 WARRANTY

- A. Warranty: Submit for Owner's documentation. Warranty shall be for a 5 year period, signed by the Contractor, manufacturer, and installer, against defects in materials or workmanship. Make repairs and replacements upon notification of defects.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Do not deliver architectural woodwork until painting, finishing, and overhead work is complete in applicable spaces.
- B. Storage: Store architectural woodwork in building, out of the way of other construction activities, at a relative humidity of 50 percent to 55 percent at 70 degrees F.

PART 2 – PRODUCTS

2.1 WOOD MATERIALS

- A. Solid Stock: Species and grade as specified in woodworking standard for casework construction, unless otherwise indicated.
 - 1. Moisture content at time of fabrication: kiln-dry lumber to the moisture content recommended by AWS section 3.
 - 2. Provide wood dressed in all exposed faces, unless otherwise indicated.
 - 3. Do not use twisted, warped, bowed, or otherwise defective wood.
 - 4. Sizes indicated are nominal unless otherwise indicated.
 - 5. Do not mark or color wood, except where such marking will be concealed in finish work.

2.2 PANEL MATERIALS

- A. Plywood: Types, grades, and cores as specified in the wood working standard, except as otherwise specified
- B. Particle board: ¾-inch thick, conforming to ANSU A208.1, Grade M2

- C. Medium Density Fiberboard (MDF): ANSI A 208.2, made with binder containing no urea formaldehyde and made of 100% pre-consumer recycled content, medium density Grade MD. Provide the following or equal:
 - 1. Medium Density: "Medite II" (Sierra-Pine Ltd.).
 - 2. Moisture Resistant Grade: "Medex" (Sierra-Pine Ltd.).
- D. Hardboard: Tempered Grade, conforming to standards of American Hardboard Association or PS-50; use smoothside exposed.
- E. Cabinet Liner for Wood Faced Casework
 - 1. Plastic Laminate: NEMA BK20,
 - 2. Color: architect to select from wood patterns
- F. Cabinet Liner for Non-Wood Faced Casework:
 - 1. Thermofused Decorative Overlay (TDO) Panels: Medium-density fiberboard with surface of thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1
 - 2. Plastic Laminate: NEMA BK20, minimum .02 inch thick
 - 3. Color: architect to select from standard colors.

2.3 WOOD VENEER

- A. Species: Walnut; Premium Grade, in color, cut and grain to match Architect's control sample.
 - 1. Minimum width: 10 inches
 - 2. Minimum thickness: 1/50 inch
 - 3. Finish:
 - a. Kitchen & Toilets: water-resistant finish
 - b. All other conditions: low-luster
 - 4. Veneer Cut: Quarter sliced
 - 5. Glue splice only. Stitched faces will not be accepted.
 - 6. Matching of Adjacent Veneer Leaves: to be determined with Architect
 - 7. Panel-Matching Method: Sequence match panel sets.
 - 8. Panel Edges: Band edges of wood panel substrate with face veneer in accordance with AWS Premium Grade, unless hardwood edge banding is shown.

2.4 PLASTIC PRODUCTS

- A. Laminated-Plastic Sheets: Comply with requirements of NEMA
 - 1. General: General Purpose Type, NEMA LD3, minimum .049 inch thick
 - 2. Cabinet Liner (if Specified TDO panel is not used): NEMA LD3, Grade CL20, "melamine", minimum .02 inch thick
 - 3. Backing Sheet: Backing grade NEMA BK20, undecorated, minimum .02 inch thick.
 - 4. Manufacturers, Colors and Patterns: As scheduled on the Drawings.

2.5 MISCELLANEOUS MATERIALS

- A. General Adhesive: Contact cement, resorcinol, or melamine base type, grade, and class best suited the intended use.
- B. Adhesives, sealants and caulks shall comply with local or regional air pollution control or air quality management district rules or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2 in the California Building Code.

2.6 HARDWARE

- A. Fasteners:
 - 1. General: As required by Reference Standard and recommended by manufacturer for intended use.
 - 2. Wood Screws and Sheet Metal Screws: Cadmium-plated steel, sizes as shown.
 - 3. Sheet Metal Angles: Fabricate angles from galvanized steel sheet, sizes and gauges as shown.
- B. Panel Clips: Aluminum interlocking panel clips; type, size and quantity as required. The following, or equal:
 - 1. "Panel "Z" Clips" (Monarch Metal Fabrications Inc.).
 - 2. "ZC3 Clips" (Doug Mockett & Co.).
- C. Cabinet Hardware: Per Reference Standards and as follows:
 - 1. Finish: dark anodized bronze finish, unless otherwise shown or specified.
 - 2. Hinges:
 - a. Concealed: European style, all-metal construction, 120-degree (170-degree) minimum opening (self-closing), 6-way adjustable, slow-closing.
 - 3. Door and Drawer Pulls:
 - a. Doug Mockett, dark anodized bronze, Tab Pull, or accepted equal.
 - 4. Locks:
 - a. General: Pin tumbler, dead bolt type.
 - b. Drawers: National C8123; one per drawer.
 - c. Doors: National C8138; one per active door leaf
 - d. Keying:
 - 1) Key locks in same room alike, key locks in different rooms different, unless otherwise directed.
 - 2) Furnish two change keys per lock and six master keys per system.
 - 5. Drawer Slides: Accuride or accepted equal. Provide two per drawer.
 - a. Full depth of drawers; quiet type with nylon ball-bearing rollers; positive pull-out stop.
 - b. Type: Side mounted, lift out, full extension
 - c. Capacity per Pair:
 - 1) Pencil Drawer: Accuride 2006 or equal, 50-pound capacity, 3/4 extension.
 - 2) Box Drawer: Accuride 3832 or equal, 100-pound capacity, full extension.
 - 3) Vertical File Drawer: Accuride 3640, or equal, 100-pound capacity, full extension.
 - 4) Lateral File Drawer: Accuride 4034, or equal, 150-pound capacity, full extension.
- D. Grommets: dark anodized bronze finish, flush mounting. The following, or equal:
 - 1. "PS Series" (Doug Mockett & Co.).
- E. Support for Adjustable Shelves in Casework:
 - 1. Manufacturer: Haeefele or equal.
 - 2. Description: Provide 4 rows of 5mm diameter holes, at 1-inch centers, full-height in every case shown to have adjustable shelves. Support each shelf on four Haeefele No. 282.24.722 nickel-plated zinc alloy plug-in supports with shelf-fixing lugs
 - 3. Concealed type at open shelving: "Magic Wire"
- F. Hanger Rods: Knappe & Vogt 660 rod and 734 flanges.

- G. Bumper Pads (silencers): clear plastic
- H. Base levelers: Zinc-plated steel with plastic adjustable floor and base for screwing into bottom of cabinet; Hafele #637.31.911 or equal
- I. Trash and recycle containers: where containers inside casework are indicated, provide plastic trash containers to fit casework.
 - 1. Single container per drawer: hafele 117.05.163, 10 ¾" long
 - 2. Multi-containers per drawer
- J. Work Surface/Counter Support Brackets: RAAKS Flush mounted brackets, EH-1818-FM. Brackets are attached to wall studs prior to gypsum board installation.
- K. Wall-Mounted Adjustable Shelf Support System:
 - 1. Manufacturer: Knap & Vogt, or equal.
 - 2. Standards: Series 87 ANO, 12-gauge steel, 7/8-inch-wide by 11/16-inch-deep.
 - 3. Knife Brackets: Series 186LL ANO/187LL ANO.
 - 4. Shelf Rests: Series 210 ANO/211 ANO/212 ANO.
 - 5. Finish: Manufacturer's standard electro-plated anochrome finish.

2.3 FABRICATION

- A. Field Measurements: Verify dimensions at project site so that Architectural Woodwork will accurately fit to adjacent work.
- B. Cut-outs: Make cut-outs required to accommodate work of other Sections in the shop.
- C. Forming and Assembly: Form work to true shapes with accurate surfaces and edges. Completely shop assemble, mark, and disassemble before delivery to Project site any Work which cannot be permanently shop assembled. Assemble partial units in place in a manner that each piece of Architectural Woodwork becomes a unified whole visually and structurally. Fabricate fillers and scribe strips of same materials and finishes as Architectural Woodwork with which they are associated.
- D. Hardware: Make cuts for hardware neat and true. Install hardware and fit securely.
- E. Back Painting: Surfaces of Architectural Woodwork which are not exposed to view at any time and abut walls or floors shall be thoroughly back painted with one heavy coat of finishing material of fabricator's choice before leaving fabricator's shop.
- F. Casework End Panels, Filler Panels, and Closure Panels: Fabricate as shown from material specified for casework doors. Secure to substrate and adjacent construction with concealed fasteners.
- G. Quality of Panels: Custom grade.
- H. Quality of Casework: Custom grade.
- I. Minimum nominal thicknesses:
 - 1. Doors: ¾ inch

2. Drawers:
 - a. Sides, backs, and subfronts: wood or panel product 3/4 inch
 - b. Bottoms: panel product, 1/4 inch
 - c. Fronts: lumber or panel product, 3/4 inch
3. Body members: panel products, 3/4 inch
4. Rails: wood or panel products, 3/4 inch
5. Shelves:
 - a. Wood: 3/4 inch for spans up to 36 inches; 1-1/8 inch for spans up to 48 inches
 - b. Veneer core plywood: 3/4 inch for spaces to 36 inch; 1 inch for spaces up to 42 inches.
 - c. Medium Density Particle Board or MDF: 3/4 inch for spaces up to 32 inches; 1 inch for spans up to 42 inches
6. Backs: panel product: 1/4 inch

2.4 FINISHING

- A. General: Factory finish Architectural Woodwork prior to delivery and installation in accordance with AWS Section 5.
- B. Transparent Finish for interior of wood veneered casework: catalyzed lacquer; WI 3a
 1. Grade: custom
 2. Gloss Level: 40 satin 30-50 degrees in accordance with ASTM D523 60 degree Gloss Meter.
- C. Opaque Finish:

PART 3 – EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates and install the work, including components and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified. Examine the areas to receive the Work and remedy detrimental conditions.
- B. Field Dimensions: Verify dimensions and conditions in field and adjust Architectural Woodwork in the shop to accommodate field conditions.

3.2 INSTALLATION

- A. Comply with Architectural Woodwork Standards. Install Work plumb and level; shim as necessary with concealed shims; accurately scribe and closely fit faceplates, filler strips, and trim strips to irregularities of adjacent surfaces.
- B. Maximum Allowable Gap: 1/16 in.
- C. Backing Plates: Secure Architectural Woodwork to structural backing with concealed fasteners, as shown or required.
- D. Installation Requirements: Provide anchoring and fastening devices required, including wood and sheet metal screws, toggle bolts, lag screws and expansion shields, among others.

- E. Hardware Installation: Install auxiliary items after final finishing has been completed. Install hinges to fit snugly, flat in mortises or on surfaces. Turn screws to a flat seat.
- F. Anchorage: Anchor supporting members solidly to surrounding construction to support loads specified and to prevent distortion or misalignment.
- G. Cutting and Trimming: Cut and trim component parts only with the approval of the manufacturer or fabricator. Restore finish completely and remove evidence of cutting and trimming.
- H. Installation Tolerances:
 - 1. Variation from Plane: Limit variation from plane or location shown to 1/8 in. in 10 ft.; 1/4 in. over total length.
 - 2. Alignment: Where surfaces abut in line and at corners and where surfaces are separated by less than 1/4 in., limit offset from true alignment to less than 1/32 in.
 - 3. Offsets In End-To-End Or Edge-To-Edge Alignment Of Consecutive Members: 1/16 in. maximum offset in any alignment.

3.3 ADJUSTING AND CLEANING

- A. Defective Work: Touch-up, refinish, or replace damaged, stained, scratched, or otherwise disfigured portions of the Work to the satisfaction of the Architect.
- B. Cleaning: Following completion of installation, clean both inside and outside surfaces of Architectural Woodwork. Polish hardware in accordance with manufacturer's recommendations.

3.4 PROTECTION

- A. General: Protect Architectural Woodwork against damage until Work is accepted.

END OF SECTION

SECTION 072100
THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Work Included:
 - 1. Glass-fiber blanket
 - 2. Sound attenuation blanket
- B. Work Specified Elsewhere:
 - 1. Gypsum Assemblies: Section 092116
 - 2. Plumbing Piping Insulation: Division 22
 - 3. HVAC Insulation: Division 23

1.3 DEFINITIONS

- A. Mineral-Fiber Insulation: Insulation composed of rock-wool fibers, slag-wool fibers, or glass fibers; produced in boards and blanket with latter formed in batts (flat-cut lengths) or rolls.

1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Surface-Burning Characteristics: ASTM E 84
 - 2. Fire-Resistance Ratings: ASTM E 119
 - 3. Combustion Characteristics: ASTM E 136

1.5 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instruction for handling, storing, and protecting during installation.

PART 2 – PRODUCTS

2.1 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, or equal:
 - 1. CertainTeed Corporation.
 - 2. Johns Mansville.
 - 3. Knauf Insulation.
 - 4. Owens Corning.
- B. Exterior Wall: Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I, with maximum flame spread and smoke-developed indexes of 25 and 50, respectively per ASTM E 84, 5 1/2" R-21. Faced side to be located at exterior wall (cold side).
- C. Interior Wall: unfaced, sound attenuation blanket, 3-1/2-inch thick or 5-1/2- inch thick Owens Corning Fiberglass or equal.

PART 3 – EXECUTION

3.1 GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise show or required to make up total thickness.

3.2 INSTALLATION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Glass-fiber Blanket Insulation: install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. For metal-framed wall cavities where cavity heights exceed 96 inches,

support unfaced blankets mechanically and support faced blankets by
taping flanges of insulation to flanges of metal studs.

END OF SECTION

SECTION 072500
WEATHER BARRIERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Self-adhering sheet air and water barriers.
 - 2. Self-adhering transition membranes for protection of all openings, corners and changes in plane, behind all siding accessories such as breaks, control joints, expansion joints, and reveals.
- B. Related Requirements:
 - 1. Section 076200 "Sheet Metal Flashing and Trim."
 - 2. Section 079200 "Joint Sealants".
 - 3. Section 074400 "Cementitious Panels" for cladding over weather barriers.

1.3 DEFINITIONS

- A. Air-Barrier Material: A primary element that provides a continuous barrier to the movement of air.
- B. Air-Barrier Accessory: A transitional component of the air barrier that provides continuity.
- C. Air-Barrier Assembly: The collection of air-barrier materials and accessory materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.

1.4 SUBMITTALS

- A. Product Data: For each type of product.

1. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties of products.
- B. Material Safety Data Sheets (MSDS): For storage at project site.
- C. Product Certificates: From air-barrier manufacturer, certifying compatibility of air barriers and accessory materials with Project materials that connect to or that come in contact with air barrier.
- D. Product Test Reports: For each air-barrier assembly, for tests performed by a qualified testing agency.
- E. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity specializing in the installation of air barrier systems with a minimum 5 years documented experience that employs installers and supervisors who are trained and approved by manufacturer.
 1. Installer shall be licensed by ABAA according to ABAA's Quality Assurance Program and shall employ ABAA-certified installers and supervisors on Project.
- B. Manufacturer Qualifications: Company specializing in production of waterproofing and air barrier systems with minimum 10 years documented continuous experience in the manufacture of permeable water-resistive air barrier products and employing experienced in-house technical and field observation personnel qualified to provide expert technical support.
- C. Mockups: Before beginning installation of air barrier, provide air barrier work for exterior wall assembly mockups, incorporating backup wall construction, external cladding, window, storefront, door frame and sill, insulation, ties and other penetrations, and flashing to demonstrate surface preparation, crack and joint treatment, application of air barriers, and sealing of gaps, terminations, and penetrations of air-barrier assembly.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original containers with seals unbroken, wrapped in a polythene sleeve, labeled with manufacturer's name, and product brand name.
- B. Protect stored materials from direct sunlight.

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply air barrier within the range of ambient and substrate temperatures recommended by air-barrier manufacturer.
 - 1. Protect substrates from environmental conditions that affect air-barrier performance.
 - 2. Do not apply air barrier to a damp or wet substrate or during snow, rain, fog, or mist.

1.8 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's written material warranty agreeing to replace air barrier membrane materials installed in conformance with manufacturer's written installation instructions that fail within 5 years from date of Substantial Completion.
- B. Installer's Warranty: Provide installer's written 2-year warranty upon completion of work. Include removing and reinstalling collateral materials associated with replacement of waterproofing that fails within specified warranty period.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Source Limitations: Obtain primary air-barrier materials and air-barrier accessories from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General: Air barrier shall be capable of performing as a continuous weather barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. Air-barrier assemblies shall be capable of accommodating substrate movement and of sealing substrate expansion and control joints, construction material changes, penetrations, tie-ins to installed waterproofing, and transitions at perimeter conditions without deterioration and air leakage exceeding specified limits.

2.3 SELF-ADHERING SHEET AIR AND WATER BARRIER

- A. Self-adhering membrane: Grace W.R. & Co. Perm-A-Barrier VPS or equal

2.4 ACCESSORY MATERIALS

- A. General: Accessory materials recommended by air-barrier manufacturer to produce a complete air-barrier assembly and compatible with primary air-barrier membrane.
- B. Primer: Liquid waterborne primer recommended for substrate by air-barrier material manufacturer.
- C. Transition Membrane: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick, cross-laminated polyethylene film with release liner backing; Grace Perm-A-Barrier Detail Membrane
- D. Foil-Faced Self-Adhered Detail Membrane: 35 mils of self-adhesive rubberized asphalt integrally bonded to 5 mils of aluminum film to provide a minimum 40 mils thick membrane, Grace Perm-a-Barrier Aluminum Flashing.
- E. Termination Mastic: Air-barrier manufacturer's standard cold fluid-applied elastomeric liquid; trowel grade. Grace Bituthene Liquid Membrane.
- F. Primers:
 - 1. Air Barrier Membrane: Water-based primer which imparts an aggressive, high finish on the treated substrate and complies with VOC limits of authorities having jurisdiction; Grace Perm-A-Barrier Primer Plus
 - 2. Transition Membrane: Perm-A-Barrier WB Primer
- G. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.
- H. Adhesive and Tape: Air-barrier manufacturer's standard adhesive and pressure-sensitive adhesive tape.
- I. Modified Bituminous Transition Strip: Vapor retarding, 40 mils thick, smooth surfaced, self-adhering; consisting of 36 mils of rubberized asphalt laminated to a 4-mil- thick polyethylene film with release liner backing.
- J. Joint Sealant: ASTM C 920, single-component, neutral-curing silicone; Class 100/50 (low modulus), Grade NS, Use NT related to exposure, and, as applicable to joint substrates indicated, Use O. Comply with Section 079200 "Joint Sealants."
- K. Small Penetration Flashing: Quick-Flash Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for air-barrier application.
- B. Mask off adjoining surfaces not covered by air barrier to prevent spillage and overspray affecting other construction.
- C. Remove grease, oil, bitumen, form-release agents, paints, curing compounds, and other penetrating contaminants or film-forming coatings from concrete.
- D. Prepare, fill, prime, and treat joints and cracks in substrates. Remove dust and dirt from joints and cracks according to ASTM D 4258.
 1. Install modified bituminous strips and center over treated construction and contraction joints and cracks exceeding a width of 1/16 inch.
- E. At changes in substrate plane, apply sealant or termination mastic beads at sharp corners and edges to form a smooth transition from one plane to another.
- F. Cover gaps in substrate plane and form a smooth transition from one substrate plane to another with stainless-steel sheet mechanically fastened to structural framing to provide continuous support for air barrier.

3.3 INSTALLATION

- A. General: Install modified bituminous sheets and accessory materials according to air-barrier manufacturer's written instructions and according to recommendations in ASTM D 6135.
 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous air-barrier sheet produced for low-temperature application. Do not install low-temperature sheet if ambient or substrate temperature is higher than 60 deg F.
- B. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D 6135.
 1. Install modified bituminous strips centered over vertical inside corners. Install 3/4-inch fillets of termination mastic on horizontal inside corners.

- C. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations with termination mastic and according to ASTM D 6135.
- D. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by air-barrier sheet on same day. Reprime areas exposed for more than 24 hours.
- E. Apply and firmly adhere modified bituminous sheets horizontally over area to receive air barrier. Accurately align sheets and maintain uniform 2-1/2-inch- minimum lap widths and end laps. Overlap and seal seams, and stagger end laps to ensure airtight installation.
 - 1. Apply sheets in a shingled manner to shed water without interception by any exposed sheet edges.
 - 2. Roll sheets firmly with a manufacturer approved hand roller to enhance adhesion to substrate.
- F. Apply continuous modified bituminous sheets over modified bituminous strips bridging substrate cracks, construction, and contraction joints.
- G. Seal top of through-wall flashings to air-barrier sheet with an additional 6-inch- wide, modified bituminous strip.
- H. Seal exposed edges of sheet at seams, cuts, penetrations, and terminations not concealed by metal counterflashings or ending in reglets with compatible sealant.
- I. Install air-barrier sheet and accessory materials to form a seal with adjacent construction and to maintain a continuous air barrier.
 - 1. Coordinate air-barrier installation with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.
 - 2. Install modified bituminous strip on roofing membrane or base flashing so that a minimum of 3 inches of coverage is achieved over each substrate.
- J. Connect and seal exterior wall air-barrier membrane continuously to roofing-membrane air barrier, concrete below-grade structures, floor-to-floor construction, exterior glazing and window systems, glazed curtain-wall systems, storefront systems, exterior louvers, exterior door framing, and other construction used in exterior wall openings, using accessory materials.
- K. Wall Openings: Prime concealed, perimeter frame surfaces of windows, curtain walls, storefronts, and doors. Apply modified bituminous transition strip so that a minimum of 3 inches of coverage is achieved over each substrate. Maintain 3 inches of full contact over firm bearing to perimeter frames with not less than 1 inch of full contact.
 - 1. Modified Bituminous Transition Strip: Roll firmly with a manufacturer approved hand roller to enhance adhesion.

- L. At end of each working day, seal top edge of air-barrier material to substrate with termination mastic.
- M. Apply joint sealants forming part of air-barrier assembly within manufacturer's recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- N. Repair punctures, voids, and deficient lapped seams in air barrier. Slit and flatten fishmouths and blisters. Patch with air-barrier sheet extending 6 inches beyond repaired areas in all directions.
- O. Do not cover air barrier until it has been tested and inspected by Owner's testing agency.
- P. Correct deficiencies in or remove air barrier that does not comply with requirements; repair substrates and reapply air-barrier components.

3.4 CLEANING AND PROTECTION

- A. Protect air-barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.
 - 1. Protect air barrier from exposure to UV light and harmful weather exposure as required by manufacturer. If exposed to these conditions for more than 30 days, remove and replace air barrier or install additional, full-thickness, air-barrier application after repairing and preparing the overexposed membrane according to air-barrier manufacturer's written instructions.
 - 2. Protect air barrier from contact with incompatible materials and sealants not approved by air-barrier manufacturer.
- B. Clean spills, stains, and soiling from construction that would be exposed in the completed Work, using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION

SECTION 073100
ASPHALT SHINGLES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Section includes:
 - 1. Asphalt roofing shingles.
 - 2. Leak barrier and roof deck protection.
 - 3. Metal flashing associated with shingle roofing.
 - 4. Attic ventilation.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry"
 - 2. Section 076200 "Flashing and Sheet Metal"
 - 3. Section 079200 "Joint Sealants"

1.3 REGULATORY REQUIREMENTS

- A. Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
- C. Install all roofing products in accordance with all federal, state and local building codes.
- D. All work shall be performed in a manner consistent with current OSHA guidelines.
- E. Reference Standards:
 - 1. ASTM D312/D312M - Standard Specification for Asphalt Used in Roofing; 2015.
 - 2. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; Fifth Edition, with interim updates.
 - 3. ASTM F1667 – Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

1.4 SUBMITTALS

- A. Product Data:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations
 - 3. Product literature.
 - 4. Installation methods.
- B. Verification Sample for each product specified.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- D. Manufacturer's Field Reports: Indicate procedures followed.

- E. Warranty: Submit manufacturer warranty and ensure forms have been completed in City of Oregon City's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience. Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
- C. Installer Qualifications: Installer must be approved for installation of all roofing products to be installed under this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
- B. Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.
- C. Store bundles on a flat, properly drained surface. Maximum stacking height shall not exceed manufacturer's recommendations. Store all rolls on end.
- D. Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.
- E. For rooftop loading, lay shingle bundles flat. Do not bend over the ridge.

1.7 FIELD CONDITIONS

- A. Do not apply roofing membrane during unsuitable weather.
- B. Do not apply roofing membrane when ambient temperature is below 40 degrees F or above 110 degrees F.
- C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.8 WARRANTY

- A. Provide a twenty year manufacturer's material and labor warranty to cover failure to prevent penetration of water.
- B. See Section 017800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: GAF Timberline.
- B. Requests for substitutions will be considered in accordance with provisions of Section 016200.

2.2 SHINGLES

- A. Granule surfaced self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and StainGuard protection, which prevents pronounced discoloration from blue-green algae through formulation/unique blends of granules.
 - 1. Traditional 3-tab styling with a 5 in. or 5 5/8 in. exposure.
 - 2. Standards/Qualifications: UL 790 Class A rated with UL 997, Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant;
 - 3. Color: As shown on Finish Schedule

2.3 LEAK BARRIER

- A. Self-adhering, self-healing, bituminous leak barrier surfaced with fine skid –resistant granules. Provide full deck coverage.
 - 1. WeatherWatch Leak Barrier by GAF

2.4 SHINGLE UNDERLAYMENT

- A. Synthetic, non-asphaltic, non-woven, anti-skid back coated, polypropylene constructed non breathable underlayment. Meets or exceeds ASTM D226 and D4869 approved by UL.
 - 1. Tiger-Paw Roof Deck Protection by GAF
 - 2. Roll: 48 inches x 250 ft (14.6 m x 76.2 m)

2.5 ROOFING CEMENT

- A. Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II.

2.6 ATTIC VENTILATION

- A. Ridge Vent: flexible rigid plastic ridge ventilator designed to allow the passage of hot air from attics, while resisting snow infiltration. Use in conjunction with eave/soffit ventilation.
 - 1. Cobra Ridge Runner Ridge vent by GAF.
 - 2. Provide 12.5 sq inches of Net Free Ventilation Area per lineal foot
- B. Under Eave Vent: See section 074400 Cementitious Panels.

2.7 NAILS

- A. Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces and site conditions are ready to receive work.
- B. Verify deck is supported and secure.
- C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
- D. Verify deck surfaces are dry and free of snow or ice.
- E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.2 WOOD DECK PREPARATION

- A. Verify flatness and tightness of joints of wood decking:
 - 1. Fill knot holes with latex filler.
 - 2. Cover with sheet metal: holes over 1 inch in diameter, cracks over 1/2 inch in width, loose knots and excessively resinous areas.
- B. Replace damaged deck with new materials.

3.3 VAPOR RETARDER INSTALLATION - CONVENTIONAL APPLICATION

- A. Extend vapor retarder under cant strips and blocking.
- B. Vent pipes: Install a 24 inch (610 mm) square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.
- C. Vertical walls: Install eaves protection membrane extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.

3.4 INSTALLATION OF SHINGLES

- A. General:

1. Install in accordance with manufacturer's instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
- B. Placement and Nailing:
1. Beginning with the starter strip, trim shingles so that they "nest" within the shingle located beneath it. This procedure will yield a first course that is typically 3 inch (76mm) to 4 inch (102mm) rather than a fully exposed shingle.
 2. Laterally, offset the new shingles from the existing keyways, to avoid waves or depressions caused by excessive dips in the roofing materials.
 3. Using the bottom of the tab on existing shingles, align subsequent courses.
 4. *Note: DO NOT install standard sized shingles (5inch exposure) over metric (5 5/8 inch exposure) shingles, as it will overexpose the shingles and reveal the nails. Use standard alignment methods to assure proper shingle placement.
 5. Secure with 4, 5, or 6 nails per shingle per manufacturer's instructions or local codes.
 6. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
 7. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
 8. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
- C. Penetrations
1. All Penetrations are to be flashed according to manufacturer, ARMA and NRCA application instructions and construction details.
- D. See Section 014500 - Quality Requirements, for general requirements for field quality control and inspection.

3.2 INSTALLATION OF ATTIC VENTILATION

- A. General
1. Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

3.3 PROTECTION

- A. Protect installed roofing and flashings from construction operations.
- B. Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.

END OF SECTION

SECTION 074400
CEMENTIOUS PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Cementious express/reveal jointed panel with accessories
 - 2. Horizontal lap siding cementious boards
 - 3. Soffit panels
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry"
 - 2. Section 072100 "Thermal Insulation"
 - 3. Section 072500 "Weather Barriers"
 - 4. Section 076200 "Sheet Metal Flashing and Trim."
 - 5. Section 079200 "Joint Sealants".
 - 6. Section 099100 "Painting"

1.3 SUBMITTALS

- A. Product Data: For each type of product, including:
 - 1. Manufacturer's requirements for related materials to be installed by others.
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods, including nail/screw patterns.
- B. Warranties: Special warranties specified in this Section.
- C. Test Report: Applicable model code authority evaluation report
- D. Maintenance Instructions: Periodic inspection recommendations and maintenance procedures.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. All fiber cement boards specified in this section must be by a manufacturer with a minimum of 10 years of experience in fabricating and supplying fiber cement cladding systems.
 - 2. Provide technical and design support as needed regarding installation requirements and warranty compliance provisions.
- B. Installer Qualifications: All products listed in this section are to be installed by a single installer trained by manufacturer or representative.
- C. Mock-up: Provide a mock-up for evaluation of surface preparation techniques
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until mock-up is approved by architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products in covered area or in stored outside, provide additional waterproofing cover over products to protect from weather. Do not allow products to get saturated with water.
- C. Store siding flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- D. Carry boards on edge. Do not carry or lift boards flat. Improper handling may cause cracking or board damage.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

- A. Manufacturer's Warranty: Provide manufacturer's 30-year limited warranty for fiber cement siding. Warranty to be appropriate for geographical location of this installation; Oregon City, Oregon.
- B. Installer's Warranty: Provide installer's written 2-year warranty upon completion of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturer: James Hardie
 - 1. Climate Zone: HZ10
- B. Cement Cladding Panels: See Finish Schedule for board and plank types, dimensions, and finishes.
- C. Soffit panels: Vented smooth, painted.

2.2 PERFORMANCE REQUIREMENTS

- A. Fiber Cement Cladding to comply with ASTM C-1186, Type A, Grade II requirements.
- B. Surface Burning (ASTM E 84): Flame Spread: 0, Smoke Developed: 5
- C. Fire Resistant (ASTM E-119): The wall assembly must successfully endure 60-minute fire exposure without developing excessive unexposed surface temperature or allowing flaming on the unexposed side of the assembly.

2.3 INSTALLATION ACCESSORIES

- A. Fasteners: Corrosion resistant fasteners, such as hot-dipped galvanized nails and screws appropriate to local building code and practices must be used. Do not use aluminum fasteners.
 - 1. Panels with reveals:
 - a. Fasteners: No. 8 x 1-1/2" long x 0.323" ribbed pan head screws.
 - 2. Lap siding:
 - a. Fasteners: No. 11ga 1.75 in long roofing nail.
 - b. Blind nail per manufacturer's instructions
- B. Flashing: Flash all areas specified in manufacturer's instructions and shown in drawings.
- C. Caulking: Tremco Dymonic FC, integral color. Provide color samples to Architect for selection.
- D. Trims: Provide exterior grade reveal trims as shown on drawings.
 - 1. Rigid vinyl reveal trim: Vinyl Corp; EIFS and DEFS accessories. Paint all vinyl trims to match adjacent panels.
 - 2. Metal trim: Fry Reglet, do not paint.
- E. Rainscreen Cavity: Install panels on a drained and vented rainscreen cavity, with a minimum 1/2" air cavity. Flash at horizontal joints to drain water.
 - 1. Furring strips: pressure treated wood
- F. Finishes: Factory applied sealer/primer, flat sheen. See Section 099000 Painting for cladding finish system.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. Do not install wet or damaged panels.

3.2 SURFACE PREPARATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Review wall framing and sheathing and notify Architect if substrate is unsatisfactory before proceeding.
- C. Clean surfaces using the methods recommended by manufacturer for achieving the best result for the substrate and project conditions.
- D. Ensure drainage plane is intact and all penetrations are sealed and flashed.

3.3 INSTALLATION

- A. Lap Siding Installation:
 - 1. Stagger joints for lap siding per manufacturer's instructions.
 - 2. Provide 6" flashing behind butt joints of lap siding with 1" overlap of plank. Do not caulk joint.
 - 3. Avoid placing butt joints directly above doors and windows.
 - 4. Fasten per manufacturer's installation requirements.
- B. Cement Panel Fastener Installation:
 - 1. Predrill panel with clearance hole for fasteners. Do not overdrive.
 - 2. Drive fasteners in perpendicular to siding and framing.
 - 3. Fasteners pattern & spacing:
 - a. Space fasteners 24" o.c. horizontally and 16" o.c. vertically. Start all spacing from center of panel.
 - b. Fastener position may be no closer than 3/4" in from panel edge and no closer than 2 inches away from corners.
 - 4. Do not countersink or fill over the fastener head.
 - 5. Fastener pattern to be aligned vertically and horizontally, equally spaced and centered on the panel.
 - 6. If fastener shears, add a fastener near to site and use a cementitious compound to fill the hole and use primer as necessary.
- C. Do not install siding less than 6 inches from surface of ground nor closer than 2 inches to roofs, patios, porches, and other surfaces where water may collect.

- D. Field cut edges shall be coated during the installation process using an exterior grade primer/sealer that is comparable with the type of paint used on project.
- E. Install self-adhering flashing membranes behind all changes of plane, corners, reveals, joint accessories and penetrations.

3.4 CLEANING AND PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 074600

WOOD SIDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Wood siding.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry"
 - 2. Section 072100 "Thermal Insulation"
 - 3. Section 072500 "Weather Barriers"
 - 4. Section 076200 "Sheet Metal Flashing and Trim."
 - 5. Section 079200 "Joint Sealants".
 - 6. Section 099100 "Painting"

1.3 SUBMITTALS

- A. Product Data: For each type of product, including:
 - 2. Preparation instructions and recommendations.
 - 3. Storage and handling requirements and recommendations.
 - 4. Installation methods.
- B. Warranties: Special warranties specified in this Section.
- C. Product Samples: Provide two samples, minimum 6 inches long, of stain color options for Architect to approve.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Minimum 5 years experience harvesting and milling forest products
- B. Mock-up: Provide a mock-up for evaluation of surface preparation techniques
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until mock-up is approved by architect.
 - 3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store products in covered area or in stored outside, provide additional waterproofing cover over products to protect from weather. Do not allow products to get saturated with water.
- C. Handling: handle materials to avoid damage.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

- A. Installer's Warranty: Provide installer's written 2-year warranty upon completion of work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Material: Western Red Cedar
- B. Pattern: Tongue and groove, V-Joint both sides
- C. Size: 1 inch x 6 inch
- D. Grade: A Clear, per NGLA 201b
- E. Moisture Content: Kiln Dried
- F. Exposed Surface: Smooth

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 - 1. Verify that substrates are sound and free of oil, grease, dirt, excess mortar, or other contaminants.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Ensure drainage plane is intact and all penetrations are sealed and flashed.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Products shall have all butt and scarf joints caulked with a quality, exterior rated, flexible caulk prior to paint application. All non-trim/fascia abutments shall be caulked and sealed with the same exterior grade caulk.
- C. Ends exposed due to post-manufacturing field cuts shall be sealed with a premium, 100% acrylic primer, to ensure no fiber is left exposed to the elements.
- D. Use only corrosion resistant fasteners. Acceptable are stainless steel or hot-dipped galvanized nails; minimum size – 7 penny.
- E. Joints shall fall over framing lumber and shall be double nailed. Trim boards of 10 inches or greater in width require 3 nails evenly spaced across the face of the board. Do not nail any less than 1/2-inch from any edge and fasten at a minimum of every 24 inches on center.
- F. Drive nails perpendicular to the framing lumber and the wood trim product; drive nails flush with the product's surface. Nails shall penetrate at least 1-1/4 inches into the structural framing.
- G. Install self-adhering flashing membranes behind all changes of plane, corners, reveals, joint accessories and penetrations.

3.4 CLEANING AND PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 076200

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Sheet Metal Flashing and Trim.
- B. Related Requirements:
 - 1. Section 073100 "Asphalt Shingles."
 - 2. Section 081113 "Wood Doors and Metal Frames"
 - 3. Section 085113 "Aluminum Windows."

1.3 COORDINATION

- A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.
- B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak-proof, secure, and noncorrosive installation.

1.4 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.
- B. Product Certificates: For each type of coping and roof edge flashing that is FM Approvals approved.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of a minimum of 5 years of successful in-service performance.
 - 1. For copings and roof edge flashings that are FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.

- B. Installer Qualifications: Engage an experienced Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a minimum 5 year fabrication and installation record of successful in-service performance.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
- B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.8 WARRANTY

- A. Contractor's Warranty
 - 1. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be water-tight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work or equipment caused by such leaks or the repairs thereof.
- B. Manufacturer's Warranty
 - 1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.

1.9 PROJECT CONDITIONS

- A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.
- B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

- A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Surface: Smooth, flat.
 - 2. Coil-Coated Finish, where noted on Drawings:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

2.3 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
- B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
 - 1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
 - a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
 - b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
 - c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
- C. Solder:
 - 1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead.
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.
- I. Slip Sheet: Red Rosin Paper, by W.R. Meadows.

2.4 FABRICATION, GENERAL

- A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
 - 1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
 - 2. Obtain field measurements for accurate fit before shop fabrication.
 - 3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
 - 4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
 - 1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.
- E. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- F. Do not use graphite pencils to mark metal surfaces.
- G. Saddles: Fabricate one-piece, watertight saddles that are mechanically fastened and soldered watertight at intersections in plane, as indicated on the Drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
 - 1. Verify compliance with requirements for installation tolerances of substrates.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
 - 3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
 2. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 3. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 4. Torch cutting of sheet metal flashing and trim is not permitted.
 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.
1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.
- F. Seal joints as required for watertight construction.
1. At typical laps, provide a sealed butt joint with a 12 inch wide backer plate. At exposed horizontal flashing, such as copings, provide a backer plate with a 6 inch wide cover plate. Manufacturer fabricated flashings shall be lapped a minimum of 4 inches and set in a bed of sealant.
 2. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
 3. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not use torches for soldering.
 2. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
 3. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

3.3 ERECTION TOLERANCES

- A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
- B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder.
- C. Clean off excess sealants.
- D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.
- E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

SECTION 079200

JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Urethane joint sealants.
 - 3. Latex joint sealants.
- B. Related Sections:
 - 1. Section 088000 "Glazing" for glazing sealants.
 - 2. Section 074400 "Cementitious Panels" for caulking.
 - 3. Section 092116 "Gypsum Assemblies" for sealing perimeter joints.

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Warranties: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- B. Product Testing: Test joint sealants using a qualified testing agency. Submit manufacturer's standard testing data, previously performed and documented.
 - 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
 - 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
- C. Mockups: Install sealant in mockups of assemblies specified in other Sections that are indicated to receive joint sealants specified in this Section. Use materials and installation methods specified in this Section.

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:
 - 1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
 - 2. Conduct field tests for each application indicated below:
 - a. Each kind of sealant and joint substrate indicated.
 - 3. Notify Architect seven days in advance of dates and times when test joints will be erected.
 - 4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
 - a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.
 - 1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
- B. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
- C. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.6 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
 - 2. When joint substrates are wet.
 - 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.8 WARRANTY

- A. Special Installer's Warranty: Manufacturer's standard form in which Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which joint-sealant manufacturer agrees to furnish joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:
 - 1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
 - 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 - 3. Mechanical damage caused by individuals, tools, or other outside agents.
 - 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following, or equal :
 - a. Dow Corning Corporation; 790.
 - b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
- B. Structural Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 50, for Use NT.
 - 1. Products: Provide the following, or equal:
 - a. Dow Corning Corporation; 795 or 995.

2.3 URETHANE JOINT SEALANTS

- A. Single-Component, Nonsag, Urethane Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, for Use NT.
 - 1. Products: Subject to compliance with requirements, provide the following, or equal :

- a. Sika Corporation, Construction Products Division; Sikaflex - 15LM.
- b. Tremco Incorporated; Vulkem 921.

2.4 LATEX JOINT SEALANTS

- A. Latex Joint Sealant: Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.
 - 1. Products: Subject to compliance with requirements, provide one of the following, or equal:
 - a. BASF Building Systems; Sonolac.
 - b. Pecora Corporation; AC-20+.
 - c. Tremco Incorporated; Tremflex 834.

2.5 PREFORMED JOINT SEALANTS

- A. Preformed Silicone Joint Sealants: Manufacturer's standard sealant consisting of precured low-modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral-curing silicone sealant for bonding extrusions to substrates.
- B. Products: Subject to compliance with requirements, provide the following, or equal:
 - 1. Dow Corning Corporation; 123 Silicone Seal.
 - 2. GE Advanced Materials - Silicones; UltraSpan US1100.

2.6 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1. Provide closed-cell material at all exterior joint applications.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.7 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Remove laitance and form-release agents from concrete.
 - 3. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 - 1. Do not leave gaps between ends of sealant backings.
 - 2. Do not stretch, twist, puncture, or tear sealant backings.
 - 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
 - 1. Place sealants so they directly contact and fully wet joint substrates.
 - 2. Completely fill recesses in each joint configuration.
 - 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

- A. Evaluation of Field-Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without

deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 081416

FLUSH WOOD DOORS AND METAL FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid core doors with veneer faces
 - 2. Hollow metal frames
- B. Related Requirements:
 - 1. Section 087100 "Door Hardware" for hardware of both swing doors.
 - 2. Section 099100 "Painting" for finish.

1.3 SUBMITTALS

- A. Product Data:
 - 1. For each type of door. Include details of core and edge construction and trim for openings. Include factory-finishing specifications.
 - 2. For each type of frame indicated. Include construction details, material descriptions, and finishes.
- B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
 - 1. Dimensions and locations of blocking.
 - 2. Dimensions and locations of mortises and holes for hardware.
 - 3. Dimensions and locations of cutouts.
 - 4. Undercuts.
 - 5. Doors to be factory finished and finish requirements.
- C. Samples for Verification:
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish.
 - 2. Corner sections of doors, approximately 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - 1. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.

- D. Warranty: Submit manufacturer's specified warranty.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body .
- B. Source Limitations: Obtain flush wood doors from single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in cardboard cartons and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.
- D. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.
- B. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 WARRANTY

- A. Special Warranty for Flush Wood Doors: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - 1. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - 2. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

3. Warranty Period for Solid-Core Interior Doors: Two years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS – FLUSH WOOD DOORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following or equal:
 1. Algoma Hardwoods, Inc
 2. Ampco, Inc.
 3. Buell Door Company Inc.
 4. Chappell Door Company
 5. Eagle Plywood & Door Manufacturing Inc.
 6. Eggers Industries
 7. Graham Wood Doors; an Assa Abloy Group company
 8. Haley Brothers Inc.
 9. Ideal Architectural Doors & Plywood
 10. Ipik Door Company
 11. Lambton Doors
 12. Marlite
 13. Marshfield Door Systems, Inc.
 14. Mohawk Flush Doors Inc
 15. Oshkosh Architectural Door Company
 16. Poncraft Door Company
 17. Vancouver Door Company
 18. VT Industries Inc.

2.2 DOOR CONSTRUCTION, GENERAL

- A. WDMA I.S.1-A Performance Grade: Heavy Duty.
- B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
- C. Particleboard-Core Doors:
 1. Particleboard: ANSI A208.1, Grade LD-1 or Grade LD-2, made with binder containing no urea-formaldehyde.
 2. Blocking: Provide wood blocking in particleboard-core doors as follows:
 - a. As needed to eliminate through-bolting hardware.
 - b. 5 inch top-rail blocking in doors indicated to have closers
 - c. 5 inch bottom rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

2.3 VENEERED-FACED DOORS FOR TRANSPARENT FINISH

- A. Interior Solid-Core Doors:
 - 1. Grade: Premium, with Grade AA faces.
 - 2. Species: Select white maple.
 - 3. Cut: Rotary cut.
 - 4. Factory Finish, Stain; Clear 0-95.
 - 5. Match between Veneer leaves: Book match.
 - 6. Assembly of Veneer Leaves on Door Faces: Balance match.
 - 7. Construction: Five Plies. Stiles and rails are bonded to core, then entire unit abrasive planed before veneering.
- B. Contractor to provide veneer species and color that is closest match to existing doors.

2.4 LIGHT FRAMES

- A. Wood beads for Light Opening in Wood Doors: Provide Manufacturer's standard wood beads as follows unless otherwise indicated.
 - 1. Wood Species: Same Species as door faces.
 - 2. Profile: Recessed tapered bead

2.5 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.6 FACTORY FINISHING

- A. General: Provide factory-finished doors. Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Transparent Finish:
 - 1. Grade: Premium.
 - 2. Finish: WDMA TR-4 Conversion varnish or TR-6 catalyzed polyurethane.
 - 3. Staining: Clear.

4. Effect: Open-grain finish.
5. Sheen: Satin.

2.7 MANUFACTURERS – HOLLOW METAL FRAMES

- 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. Amweld Building Products.
 2. Benchmark; a division of Therma-Tru Corporation.
 3. Ceco Door Products.
 4. Curries Company.
 5. Deansteel Manufacturing Company, Inc.
 6. Firedoor Corporation.
 7. Fleming Door Products.
 8. Gateway Metal Products.
 9. Habersham Metal Products Company.
 10. Karpen Steel Custom Doors & Frames.
 11. Kewanee Corporation.
 12. Mesker Door Inc.
 13. Security Metal Products Corp.
 14. Steelcraft.
 15. Windsor Republic Doors.

2.8 MATERIALS – HOLLOW METAL FRAMES

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Interior Frames: Fabricated from cold-rolled steel sheet.
 1. Fabricate frames with mitered or coped corners.
 2. Fabricate frames as full profile welded unless otherwise indicated.
 3. Frames for Wood Doors: 0.053 inch (1.3 mm) thick steel sheet.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames and high frequency reinforcement at top hinge.

2.9 FABRICATION – HOLLOW METAL FRAMES

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerance: Fabricate hollow metal work to tolerances indicated in SDI 117.

- C. Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint. Fabricated of same thickness metal as frames.
 - 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.
 - 2. Jamb Anchors: Provide number and spacing of anchors as follows below:
 - a. Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - a) Three anchors per jamb up to 60 inches high.
 - b) Four anchors per jamb from 60 to 90 inches high.
 - c) Five anchors per jamb from 90 to 96 inches high.
 - d) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - e) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.
 - 2. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
- D. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 - 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Remove welded –in shipping spreaders of door frames installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation of door frames, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerance:
 - 1. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - 2. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to place of wall.
 - 3. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to place of wall.
 - 4. Plumbness: Plus or minus 1/16 inch, measured at jambs on a perpendicular line from head to floor.

- C. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
- C. Hollow Metal Frames: Install hollow metal frames of sizes and profile indicated. Comply with ANSI/SDI A250.11.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 DOOR INSTALLATION

- A. All door and gasket assemblies shall be installed in accordance with the manufacturer's instructions.
- B. Install the threshold's horizontal surface 1/4 inch above the finish surface on the swing-side of the doors.
- C. Hardware: see Section 087100 "Door Hardware".
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.4 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or that do not comply with requirements. Doors may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION

SECTION 083100

ACCESS DOORS AND PANELS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.1 SUMMARY

- A. Section Includes
 - 1. Access Doors and Panels
- B. Related Requirements:
 - 1. Section 095100 "Acoustical Ceiling Panel"
 - 2. Section 092116 "Gypsum Assemblies"
 - 3. Section 099100 "Field Painting"

1.2 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating specified requirements.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Deliver panels in manufacturer's standard protective packaging.
- B. Storage and Protection: Do not remove protective packaging until time of installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Metal Access Doors: Karp specified as standard
 - 1. Karp Associates, Inc.
 - 2. Larsen's Manufacturing Co.
 - 3. Milcor, Nystrom, Inc.
 - 4. JL Industries,

5. Accepted equal

2.2 MATERIALS

- A. General:
 1. Fabricate metal access doors of continuous welded-steel construction. Grind welds smooth and flush with adjacent surfaces.
 2. Provide attachment devices and fasteners of type required for specific project conditions.
 3. Provide stainless steel doors and frames at ceramic tile walls.
 4. At sound-rated conditions use "fire-rated" type doors
 5. Products specified in Division 15 and 16 that meet the requirements of this Section are acceptable.
 6. Provide fastening devices, masonry anchors, casing beads, and other items as required to secure panel and frame in place.
 7. Reinforce doors over 24 in. square to prevent sagging
- B. Gypsum Board Ceilings – Rated: Metal; Karp Model KRP-350FR and KRP-450FR or accepted equal
 1. Type: Manufacturer's fire-rated access doors with UL "B" Label
 2. Style: textured 1-inch frame and bead to receive drywall joint compound installed in sufficient thickness to conceal flange.
 3. Frame: 16-gauge galvanized steel.
 4. Door: 20-gauge galvanized steel, insulated sandwich type at ceilings, self-latching.
 5. Hinges: Allow opening to 175 degrees, self-closing.
- C. Gypsum Board Partitions- Non-Rated: Karp Type KDW,
 1. Style: Flush panel type with frame flanges for joint compound concealment
 2. Frame: 16-gauge galvanized steel
 3. Door: 14-gauge galvanized steel
 4. Hinge: Continuous piano type or concealed spring, allowing opening to 175 degrees
- D. Gypsum Board Partitions – Rated: Karp Model KRP-250FR or accepted equal
 1. Style: Flanged type for flush mounting with concealed frames
 2. Frame: 16-gauge galvanized steel.
 3. Door: 14-gauge galvanized steel.
 4. Hinges: Allow opening to 175 degrees, self-closing.
- E. Tiled Gypsum Partition – Non-Rated: Karp Model DSC-214M or accepted equal; stainless steel
 1. Trim Style: 3/4-inch wide, flush flange.
 2. Frame: 16-gauge stainless steel.
 3. Door: 14-gauge stainless steel.
- F. Tiled Gypsum Partition – Rated: Karp Model KRP-250FR or accepted equal
 1. Type: manufacturer's fire rated access doors with UL "B" Label.
 2. Style: 1-inch wide trim with welded corners, ground smooth
 3. Frame: 16-gauge stainless steel
 4. Door: 16-gauge stainless steel
 5. Hinges: allow opening to 175 degrees, self-closing.

- G. Locks:
 - 1. Nonpublic Areas: Allen key or screwdriver-operated latch
 - 2. Public Building Areas: Key-operated cylinder lock. Provide two keys per lock and key locks alike
- H. Finishes:
 - 1. Metal Doors and Other Metal Surfaces: Factory-applied rust-resistant prime coat. Doors shall be field finish painted to match adjacent wall or ceiling finish.
- I. Sizes: As indicated and as required for access and by regulatory agencies but not less than 10 inches by 10 inches.

PART 3 - EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates and install the work, including components and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified. Examine the areas to receive the Work and remedy detrimental conditions.

3.2 INSTALLATION

- A. General: Install, per manufacturer's recommendations, securely to framing in locations required to give access to plumbing, mechanical, electrical, or similar devices concealed in walls or ceilings.
- B. Coordination: Coordinate with other trades to verify correct sizes and locations of access panels.

3.3 ADJUSTMENT

- A. General: Following installation, adjust access panels for smooth operation.

3.4 CLEANING

- A. General: Thoroughly clean surface of grease, oil, or other impurities, touch up abraded prime coats and otherwise prepare for finish painting.

END OF SECTION

SECTION 084115
ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior windows.
- B. Related Requirements:
 - 1. Section 076200 "Sheet Metal Flashing and Trim."
 - 2. Section 079200 "Joint Sealants".
 - 3. Section 088000 "Glazing".

1.3 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For aluminum-framed windows. Include plans, elevations, sections, full-size details, and attachments to other work.
 - 1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
 - 2. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
- C. Finish Samples: Provide manufacturer's standard finishes for Architect selection.
- D. Qualification Data: For Installer.
- E. Energy Performance Certificates: For aluminum-framed entrances and storefronts, accessories, and components, from manufacturer.
 - 1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront.

- F. Product Test Reports: For aluminum-framed entrances and storefronts, for tests performed by manufacturer and witnessed by a qualified testing agency.
- G. Field quality-control reports.
- H. Sample Warranties: For special warranties.
- I. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including, but not limited to, excessive deflection.
 - b. Noise or vibration created by wind and thermal and structural movements.
 - c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - d. Water penetration through fixed glazing and framing areas.
 - e. Failure of operating components.
 - 2. Warranty Period: 5 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrances and storefronts representing those indicated for this

Project without failure due to defective manufacture, fabrication, installation, or other defects in construction. No specific testing is to be performed for this project, as long as specified product meets the following criteria.

1. Aluminum-framed windows shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Structural Drawings.
2. Other Design Loads: As indicated on Structural Drawings.

C. Deflection of Framing Members: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to edge of glass in a direction perpendicular to glass plane not exceeding $1/175$ of the glass edge length for each individual glazing lite or an amount that restricts edge deflection of individual glazing lites to $3/4$ inch, whichever is less.
2. Deflection Parallel to Glazing Plane: Limited to $1/360$ of clear span or $1/8$ inch, whichever is smaller.
 - a. Operable Units: Provide a minimum $1/16$ -inch clearance between framing members and operable units.
3. Cantilever Deflection: Where framing members overhang an anchor point, as follows:
 - a. Perpendicular to Plane of Wall: No greater than $1/240$ of clear span plus $1/4$ inch for spans greater than 11 feet $8\text{-}1/4$ inches or $1/175$ times span, for spans less than 11 feet $8\text{-}1/4$ inches.

D. Structural: Tested according to ASTM E 330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Air Infiltration: Test according to ASTM E 283 for infiltration as follows:

1. Fixed Framing and Glass Area:
 - a. Maximum air leakage of 0.06 cfm/sq. ft. at a static-air-pressure differential of 6.24 lbf/sq. ft.

- F. Water Penetration under Static Pressure: Test according to ASTM E 331 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft.
- G. Water Penetration under Dynamic Pressure: Test according to AAMA 501.1 as follows:
1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft..
 2. Maximum Water Leakage: According to AAMA 501.1. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.

2.2 MANUFACTURERS

- A. Subject to compliance with requirements, provide: CRL 7200 Series or comparable product by one of the following:
1. EFCO Corporation
 2. Kawneer North America; an Alcoa company.
 3. TRACO.
 4. Vistawall Architectural Products
 5. Or approved equal.
- B. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing and accessories, from single manufacturer.

2.3 FRAMING

- A. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.
1. Glazing System: Retained mechanically with gaskets on four sides.
 2. Finish: High-performance organic finish.
- B. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.
- C. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.
- D. Materials:
1. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
 - a. Sheet and Plate: ASTM B 209 .
 - b. Extruded Bars, Rods, Profiles, and Tubes: ASTM B 221 .
 - c. Extruded Structural Pipe and Tubes: ASTM B 429/B 429M.
 - d. Structural Profiles: ASTM B 308/B 308M.

2. Steel Reinforcement: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods according to recommendations in SSPC-SP COM, and prepare surfaces according to applicable SSPC standard.
 - a. Structural Shapes, Plates, and Bars: ASTM A 36/A 36M.
 - b. Cold-Rolled Sheet and Strip: ASTM A 1008/A 1008M.
 - c. Hot-Rolled Sheet and Strip: ASTM A 1011/A 1011M.

2.4 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."

2.5 ACCESSORIES

- A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.
 1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
 2. Reinforce members as required to receive fastener threads.
 3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system, fabricated from 300 series stainless steel.
- B. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.
- C. Bituminous Paint: Cold-applied asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos, formulated for 30-mil thickness per coat.

2.6 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- C. Fabricate components that, when assembled, have the following characteristics:
 1. Profiles that are sharp, straight, and free of defects or deformations.
 2. Accurately fitted joints with ends coped or mitered.
 3. Physical and thermal isolation of glazing from framing members.
 4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
 5. Provisions for field replacement of glazing from exterior.
 6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
- D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

- E. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 1. Color and Gloss: See Finish Schedule

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's written instructions.
 - 2. Do not install damaged components.
 - 3. Fit joints to produce hairline joints free of burrs and distortion.
 - 4. Rigidly secure nonmovement joints.
 - 5. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.
 - 6. Seal perimeter and other joints watertight unless otherwise indicated.
- B. Metal Protection:
 - 1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
 - 2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.
- C. Set continuous sill members and flashing in full sealant bed as specified in Section 079200 "Joint Sealants" to produce weathertight installation. Predrill-holes for fasteners and fill with sealant prior to installing fasteners.
- D. Install components plumb and true in alignment with established lines and grades.
- E. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

- F. Install glazing as specified in Section 088000 "Glazing."
- G. Install weatherseal sealant according to Section 079200 "Joint Sealants" and according to sealant manufacturer's written instructions to produce weatherproof joints. Install joint filler behind sealant as recommended by sealant manufacturer.

3.3 ERECTION TOLERANCES

- A. Erection Tolerances: Install aluminum-framed entrances and storefronts to comply with the following maximum tolerances:
 - 1. Plumb: 1/8 inch in 10 feet ; 1/4 inch in 40 feet.
 - 2. Level: 1/8 inch in 20 feet ; 1/4 inch in 40 feet.
 - 3. Alignment:
 - a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch .
 - b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch .
 - c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch .
 - 4. Location: Limit variation from plane to 1/8 inch in 12 feet ; 1/2 inch over total length.

END OF SECTION

SECTION 087100

DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Electromechanical door hardware, power supplies, back-ups and surge protection.
 - 2. Entry Access System.
- C. Related Sections:
 - 1. Division 08 Section "Flush Wood Doors and Metal Frames".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door

Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 4. Electrical Coordination: Coordinate with related Division 26 Electrical Sections the voltages and wiring details required at electrically controlled and operated hardware openings.
- C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.
- D. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.
- E. Warranties and Maintenance: Special warranties and maintenance agreements specified in this Section.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

- B. Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing both standard and electrified builders hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor in good standing by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
 - 1. Scheduling Responsibility: Preparation of door hardware and keying schedules.
- D. Source Limitations: Obtain each type and variety of Door Hardware specified in this Section from a single source, qualified supplier unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- E. Regulatory Requirements: Comply with NFPA 70, NFPA 80, NFPA 101 and ANSI A117.1 requirements and guidelines as directed in the model building code including, but not limited to, the following:
 - 1. NFPA 70 "National Electrical Code", including electrical components, devices, and accessories listed and labeled as defined in Article 100 by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 2. Where indicated to comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," ANSI A117.1 as follows:
 - a. Handles, Pulls, Latches, Locks, and other Operating Devices: Shape that is easy to grasp with one hand and does not require tight grasping, tight pinching, or twisting of the wrist.
 - b. Door Closers: Comply with the following maximum opening-force requirements indicated:
 - 1) Interior Hinged Doors: 5 lbf applied perpendicular to door.
 - 2) Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
 - c. Thresholds: Not more than 1/2 inch high. Bevel raised thresholds with a slope of not more than 1:2.

3. NFPA 101: Comply with the following for means of egress doors:
 - a. Latches, Locks, and Exit Devices: Not more than 15 lbf to release the latch. Locks shall not require the use of a key, tool, or special knowledge for operation.
 - b. Thresholds: Not more than 1/2 inch high.
- F. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 1. Function of building, purpose of each area and degree of security required.
 2. Plans for existing and future key system expansion.
 3. Requirements for key control storage and software.
 4. Installation of permanent keys, cylinder cores and software.
 5. Address and requirements for delivery of keys.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.
- C. Door and Frame Preparation: Related Division 08 Sections (Steel, Aluminum and Wood) doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive

the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Ten years for mortise locks and latches.
 - 2. Five years for exit hardware.
 - 3. Twenty five years for manual surface door closers.
 - 4. Ten years for heavy duty floor closers.
 - 5. Two years for shallow depth floor closers.
 - 6. Two years for electromechanical door hardware.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Continuing Service: Beginning at Substantial Completion, and running concurrent with the specified warranty period, provide continuous (6) months full maintenance including repair and replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door opening operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
 - 1. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - a. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- B. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the following applications:
 - 1) Out-swinging exterior doors.
 - 2) Out-swinging access controlled doors.
 - 3) Out-swinging lockable doors.
 - 5. Acceptable Manufacturers:
 - a. Hager Companies (HA).
 - b. McKinney Products (MK).
- B. Continuous Geared Hinges: ANSI/BHMA A156.26 certified continuous geared hinge with minimum 0.120-inch thick extruded 6060 T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Provide concealed flush mount (with or without inset), full surface, or half surface, in standard and heavy duty models, as specified in the Hardware Sets. Concealed continuous hinges to be U.L. listed for use on up to and including 90 minute rated door installations and U.L. listed for windstorm components where applicable. Factory cut hinges for door size and provide with removable service power transfer panel where indicated at electrified openings.
 - 1. Acceptable Manufacturers:
 - a. McKinney Products (MK).
 - b. Pemko Manufacturing (PE).
- C. Pin and Barrel Continuous Hinges: ANSI/BHMA A156.26 certified pin and barrel continuous hinges with minimum 12 gauge (.105) Type 304 stainless steel hinge leaves, concealed teflon-coated stainless pin, and twin self-lubricated nylon bearings at each knuckle separation. Fabricate hinges non-handed and U.L. listed for use on up to and including 3 hour rated doors and U.L. listed for windstorm components where applicable. Provide hinges with power transfer cutouts where indicated at electrified openings.
 - 1. Acceptable Manufacturers:
 - a. Markar Products (MR).
 - b. McKinney Products (MK).

2.3 POWER TRANSFER DEVICES

- A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
1. Acceptable Manufacturers:
 - a. Hager Companies (HA) - ETW-QC (# wires) Option.
 - b. McKinney Products (MK) - QC (# wires) Option.
- B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.
1. Acceptable Manufacturers:
 - a. Securitron (SU) - EL-CEPT Series.
- C. Electric Door Hardware Cords: Provide electric transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.
1. Acceptable Manufacturers:
 - a. McKinney Products (MK) – QC-C Series.
- Provide one each of the following tools as part of the base bid contract:
- a. McKinney Products (MK) - Electrical Connecting Kit: QC-R001.
 - b. McKinney Products (MK) - Connector Hand Tool: QC-R003.
 - c. (RO).
 - d. Trimco (TC).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
1. Mortise Type: Threaded cylinders with rings and straight- or clover-type cam.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
- D. Permanent Cores: Manufacturer's standard; finish face to match lockset; complying with the following:
1. Removable Cores: Core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware. Provide removable core (small or large format) as specified in Hardware Sets.
- E. Patented Cylinders: ANSI/BHMA A156.5, Grade 1, certified cylinders employing a utility patented and restricted keyway requiring the use of patented controlled keys. Provide bump resistant, fixed core cylinders as standard with solid recessed cylinder collars. Cylinders are to be factory keyed where permanent keying records will be established and maintained.
1. Provide a 6 pin multi-level master key system comprised of patented controlled keys and security and high security cylinders operated by one (1) key of the highest level. Geographical exclusivity to be provided for all security and high security cylinders and UL437 certification where specified.
 - a. Level 1 Cylinders: Provide utility patented controlled keyway cylinders that are furnished with patented keys available only from authorized distribution.
 - b. Level 2 Cylinders: Provide utility patented controlled keyway and side bar locking incorporating unique angled bottom pins for geographical exclusivity. Cylinders constructed to provide protection against bumping and picking.
 - c. Level 3 Cylinders: Provide utility patented controlled keyway and side bar locking incorporating unique angled bottom pins for geographical exclusivity. Cylinders to be UL437 certified and constructed to provide protection against bumping, picking, and drilling.
 - d. Refer to hardware sets for specified levels.
 2. Acceptable Manufacturer:
 - a. Sargent Manufacturing (SA) - Degree Series.
 - b. Corbin Russwin (RU) – Access 3 Series.
- F. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner. Incorporate decisions made in keying conference, and as follows:
1. Master Key System: Cylinders are operated by a change key and a master key.

2. Grand Master Key System: Cylinders are operated by a change key, a master key, and a grand master key.
3. Great-Grand Master Key System: Cylinders are operated by a change key, a master key, a grand master key, and a great-grand master key.
4. Existing System: Master key or grand master key locks to Owner's existing system.
5. Keyed Alike: Key all cylinders to same change key.

G. Key Quantity: Provide the following minimum number of keys:

1. Top Master Key: One (1)
2. Change Keys per Cylinder: Two (2)
3. Master Keys (per Master Key Group): Two (2)
4. Grand Master Keys (per Grand Master Key Group): Two (2)
5. Construction Keys (where required): Ten (10)
6. Construction Control Keys (where required): Two (2)
7. Permanent Control Keys (where required): Two (2)

H. Construction Keying: Provide construction master keyed cylinders or temporary keyed construction cores where specified. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Furnish permanent cores for installation as directed under specified "Keying Conference".

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified mortise locksets furnished in the functions as specified in the Hardware Sets. Locksets to be manufactured with a corrosion resistant, stamped 12 gauge minimum formed steel case and be field-reversible for handing without disassembly of the lock body. Lockset trim (including knobs, levers, escutcheons, roses) to be the product of a single manufacturer. Furnish with standard 2 3/4" backset, 3/4" throw anti-friction stainless steel latchbolt, and a full 1" throw stainless steel bolt for deadbolt functions.

1. Acceptable Manufacturers:

- a. Corbin Russwin Hardware (RU) – ML2000 Series.
- b. Sargent Manufacturing (SA) – 8200 Series.
- c. Yale Locks and Hardware (YA) – 8800FL Series.

B. Lock Trim Design: Sargent Aventura NI style, "O" Rose

2.6 INTEGRATED WIEGAND OUTPUT ACCESS CONTROL LOCKING DEVICES

A. Integrated Wiegand Output Mortise Locks: Wiegand output ANSI A156.13, Grade 1, mortise lockset with integrated proximity card reader, request-to-exit signaling, door position status switch, and latchbolt monitoring in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle trim, 3/4" deadlocking anti-friction latch, and 1" case-hardened steel deadbolt. Lock is U.L listed and labeled for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.

1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand compatible access control systems. Latchbolt monitoring and door position switch act in conjunction to report door-in-frame (DPS) and door latched (door closed and latched) conditions.
2. Reader supports either HID 125 kHz proximity (up to 39 bits, including Corporate 1000) or 13.56 MHz (2K-32K) iClass® credentials.
3. 12VDC external power supply required for reader and lock, with optional 24VDC operation available with iClass® reader (125 kHz reader is always 12VDC). Fail safe or fail secure options.
4. Installation requires only one cable run from the lock to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
5. Installation to include manufacturer's access control panel interface board or module where required for Wiegand output protocol.
 - a. Acceptable Manufacturers:
 - 1) Corbin Russwin Hardware (RU) - Access 600 - ML20600 RNE1 Series.
 - 2) Sargent Manufacturing (SA) - Harmony - H1/H2 8200 Series.
 - 3) Yale Locks and Hardware (YA) - Symphony - S8800 SYM Series.

2.7 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- B. Standards: Comply with the following:
 1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 4. Dustproof Strikes: BHMA A156.16.

2.8 DEVICES

- A. Wiegand Output Integrated Card Reader Exit Hardware: Wiegand output ANSI 156.3 Grade 1 rim, mortise, and vertical rod exit device hardware with integrated proximity card reader, latchbolt and touchbar monitoring, and request-to-exit signaling, in one complete unit. Hard wired, solenoid driven locking/unlocking control of the lever handle exit trim with 3/4" throw latch bolt. U.L listed and labeled for either panic or "fire exit hardware" for use on up to 3 hour fire rated openings. Available with or without keyed high security cylinder override.

1. Open architecture, hard wired platform supports centralized control of locking units with new or existing Wiegand compatible access control systems. Inside push bar (request-to-exit) signaling and door position (open/closed status) monitoring (via separately connected DPS).
2. Reader supports either HID 125 kHz proximity (up to 39 bits, including Corporate 1000) or 13.56 MHz (2K-32K) iClass® credentials.
3. 12VDC external power supply required for reader, with optional 24VDC operation available with iClass® reader (125 kHz reader is always 12VDC). 24VDC required for solenoid operated exit trim (12VDC if applicable). Fail safe or fail secure options.
4. Installation requires only one cable run from the exit hardware to the access control panel without requirements for additional proprietary lock panel interface boards or modules.
5. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - Access 600 - ED5000 RNE1 Series.
 - b. Sargent Manufacturing (SA) - Harmony - H1/H2 80 Series.
 - c. Yale Security (YA) - Symphony -7100 SYM Series.

2.9 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Cycle Testing: Provide closers which have surpassed 10 million cycles in a test witnessed and verified by UL.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.

- c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
 - 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.
- B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.
 - 1. Acceptable Manufacturers:
 - a. Sargent Manufacturing (SA) - 351 Series.
 - b. Norton Door Controls (NO) - 7500 Series.
 - c. Yale Locks and Hardware (YA) - 4400 Series.

2.10 ARCHITECTURAL TRIM

- A. Door Protective Trim
 - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 - 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 - 3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following.
 - a. Stainless Steel: .050-inch thick, with countersunk screw holes (CSK).
 - b. Brass or Bronze: .050-inch thick, with countersunk screw holes (CSK).
 - c. Laminate Plastic or Acrylic: 1/8-inch thick, with countersunk screw holes (CSK).
 - 4. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.
 - 5. Metal Door Edging: Door protection edging fabricated from a minimum .050-inch thick metal sheet, formed into an angle or "U" cap shapes, surface or mortised mounted onto

edge of door. Provide appropriate leg overlap to account for protection plates as required. Height to be as specified in the Hardware Sets.

6. Acceptable Manufacturers:
 - a. Rockwood Manufacturing (RO).

2.11 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Acceptable Manufacturers:
 - a. Rockwood Manufacturing (RO).
 - b. Trimco (TC).

- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Acceptable Manufacturers:
 - a. Rixson Door Controls (RF).
 - b. Rockwood Manufacturing (RO).
 - c. Sargent Manufacturing (SA).

2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
 - 1. Pemko Manufacturing (PE).
 - 2. Reese Enterprises, Inc. (RS).

2.13 ELECTRONIC ACCESSORIES

- A. Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw for the specified electrified hardware and access control equipment.
 - 1. Acceptable Manufacturers:
 - a. Sargent Manufacturing (SA) – 3500 Series.
 - b. Securitron (SU) - BPS Series.

2.14 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.15 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. and provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SCHEDULE

- A. Contractor to provide hardware schedule based on the Door Schedule and an assessment of existing door hardware that is to remain and/or be altered for card readers or rekeying.

END OF SECTION 087100

SECTION 088000

GLAZING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Work Included
 - 1. Windows.
 - 2. Doors with vision lites.
- B. Related Sections:
 - 1. Section 085113 "Aluminum Windows."

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.
- C. Interspace: Space between lites of an insulating-glass unit.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.
- B. Delegated Design: Design glass, including comprehensive engineering analysis according to ASTM E 1300 by a qualified professional engineer, using the following design criteria:
 - 1. Design Wind Pressures: As indicated on Drawings.
 - 2. Design Wind Pressures: Determine design wind pressures applicable to Project according to ASCE/SEI 7, based on heights above grade indicated on Drawings.
 - a. Wind Design Data: As required by Code.
 - 3. Vertical Glazing: For glass surfaces sloped 15 degrees or less from vertical, design glass to resist design wind pressure based on glass type factors for short-duration load.
 - 4. Thickness of Patterned Glass: Base design of patterned glass on thickness at thinnest part of the glass.

5. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch, whichever is less.
 6. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
 7. Provide tempered or laminated glazing where required to meet safety glazing requirements of Local Authorities Having Jurisdiction (AHJ). Conform to CBC 2406.3
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.
- C. Qualification Data: For installers and manufacturers of insulating-glass units with sputter-coated, low-e coatings.
- D. Product Certificates: For glass and glazing products, from manufacturer.
- E. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated glass and insulating glass.
1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- F. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications for Insulating-Glass Units with Sputter-Coated, Low-E Coatings: A qualified insulating-glass manufacturer who is approved and certified by coated-glass manufacturer.
- B. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- E. Source Limitations for Glass: Obtain coated float glass, and insulating glass from single source from single manufacturer for each glass type.
- F. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.

- G. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Glazing Manual."
 - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
 - 3. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- H. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- I. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of IGCC.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
- B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F.

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS TYPES

- A. Solar controlled Low-E Insulating Glass Unit: Provide low emissivity insulating-glass units for all new windows complying with the following:
 1. Basis of Design: Oldcastle Glass PPG Solarban 60 on Clear Low-E #2 or comparable product.
 2. Overall Unit Thickness and Thickness of Each Lite: 1" and 1/4" (25 and 6 mm)
 3. Interspace Content: Air.
 4. Indoor Lite: Type I (transparent glass, flat), Class I (clear) float glass.
 - a. Annealed.
 5. Outdoor Lite: Type I (transparent glass, flat), float glass
 - a. Class 2 (heat absorbing and light reducing)
 - b. Annealed.
 6. Low-E Coating: Sputtered on second surface.
 7. Visible Light Transmittance: 35 percent
 8. Winter Nighttime U-Value: 0.29.
 9. Summer Daytime U-Value: 0.28.
 10. Solar Heat Gain Coefficient (SHGC): 0.27-0.31.
 11. Outdoor Visible Reflectance: 6 percent
 12. Shading Coefficient: 0.27-0.31.
 13. Relative Heat Gain (RHG): 58-66.
 14. Applications: Exterior glazing.
- B. Tempered vision glass in doors: (clear) float glass, tempered.
 1. Door Type A: 1/4" thick.
 2. Door Type C: 3/8" thick.

2.2 GLASS PRODUCTS, GENERAL

- A. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
 1. Minimum Glass Thickness for Exterior Lites: Not less than 6.0 mm.
- B. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article.

- C. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick.
 2. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
 3. U-Factors: Center-of-glazing values, according to NFRC 100 and based on LBL's WINDOW 5.2 computer program, expressed as Btu/sq. ft. x h x deg F.
 4. Solar Heat-Gain Coefficient and Visible Transmittance: Center-of-glazing values, according to NFRC 200 and based on LBL's WINDOW 5.2 computer program.
 5. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 2. For uncoated glass, comply with requirements for Condition A.
 3. For coated vision glass, comply with requirements for Condition C (other coated glass).

2.4 GLAZING SEALANTS

- A. General:
1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 4. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.
- B. Glazing Sealant: Neutral-curing silicone glazing sealant complying with ASTM C 920, Type S, Grade NS, Class 100/50, Use NT.
1. Products: Subject to compliance with requirements, provide the following, or equal:
 - a. Dow Corning Corporation; 790.
 - b. GE Advanced Materials - Silicones; SilPruf LM SCS2700.
 - c. Pecora Corporation; 890.
 - d. Sika Corporation, Construction Products Division; SikaSil-C990.
 - e. Tremco Incorporated; Spectrem 1.

2.5 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

2.6 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- G. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.7 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches.
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and

glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.

2. Provide 1/8-inch minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

- A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.
- B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.
- C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION

SECTION 092116
GYPSUM ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
- B. Related Requirements:
 - 1. Section 079200 "Joint Sealants" for acoustical sealant.
 - 2. Section 099100 "Painting"

1.3 SUBMITTALS

- A. Product Data: For each type of product.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.
- B. Do not install paper-faced gypsum panels until installation areas are enclosed and conditioned.
- C. Ventilation:
 - 1. Provide controlled ventilation during joint finishing in order to eliminate excessive moisture.
 - 2. Avoid drafts during hot, dry weather in order to prevent excessively fast drying of joint compound.

- D. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
 - 2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.
- B. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by an independent testing agency.

2.2 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
- B. Provide products manufactured by or recommended by manufacturer of gypsum board in order to maintain single source responsibility.

2.3 INTERIOR GYPSUM BOARD

- 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. CertainTeed Corp.
 - 2. Georgia-Pacific Gypsum LLC.
 - 3. National Gypsum Company.
 - 4. USG Corporation.
- B. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Thickness: 5/8 inch (15.9 mm), unless otherwise noted.
 - 2. Long Edges: Tapered.

2.4 TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Board: ASTM C 1178/C 1178M, with manufacturer's standard edges.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. CertainTeed Corp.; GlasRoc Tile Backer.
 - b. Georgia-Pacific Gypsum LLC; DensShield Tile Backer.
2. Core: 5/8 inch (15.9 mm), Type X, unless otherwise noted.
3. Mold Resistance: ASTM D 3273, score of 10.

2.5 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.
 1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, or paper-faced galvanized steel sheet.
 2. Shapes:
 - a. Cornerbead.
 - b. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - c. L-Bead: L-shaped; exposed long flange receives joint compound.
 - d. U-Bead: J-shaped; exposed short flange does not receive joint compound.
 - e. Expansion (control) joint.
- B. Aluminum Trim: Extruded accessories of profiles and dimensions indicated.
 1. 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:
 - a. Fry Reglet Corp.
 - b. Gordon, Inc.
 - c. Pittcon Industries.
 2. Aluminum: Alloy and temper with not less than the strength and durability properties of ASTM B 221 (ASTM B 221M), Alloy 6063-T5.
 3. Finish: Corrosion-resistant primer compatible with joint compound and finish materials specified.

2.6 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
 2. Glass-Mat Gypsum Sheathing Board: 10-by-10 glass mesh.
 3. Tile Backing Panels: As recommended by panel manufacturer.
- C. Joint Compound for Interior Gypsum Board: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats.
 1. Adhesives, sealants and caulks shall comply with local or regional air pollution control or air quality management district rules or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2 in the California Building Code.
 2. Prefilling: At open joints, rounded or beveled panel edges, and damaged surface areas, use setting-type taping compound.

3. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use drying-type, all-purpose compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
4. Fill Coat: For second coat, use setting-type, sandable topping compound.
5. Finish Coat: For third coat, use setting-type, sandable topping compound.
6. Skim Coat: For final coat of Level 5 finish, use setting-type, sandable topping compound.

2.7 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written recommendations.
- B. Laminating Adhesive: Adhesive or joint compound recommended for directly adhering gypsum panels to continuous substrate.
 1. Adhesives, sealants and caulks shall comply with local or regional air pollution control or air quality management district rules or SCAQMD Rule 1168 VOC limits, as shown in Tables 5.504.4.1 and 5.504.4.2 in the California Building Code.
- C. Steel Drill Screws: ASTM C 1002, unless otherwise indicated.
- D. Exterior Thermal Insulation: ASTM C 553, Mineral Fiber Blanket Thermal Insulation, Type III. Design is based on Owens Corning Type 701
- E. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
 1. Fire-Resistance-Rated Assemblies: Comply with mineral-fiber requirements of assembly.
 2. Products:
 - a. USG Corporation; SHEETROCK Acoustical Sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and substrates including welded hollow-metal frames and framing, with Installer present, for compliance with requirements and other conditions affecting performance.
- B. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING PANELS, GENERAL

- A. Comply with ASTM C 840.

- B. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
- D. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- E. Form control and expansion joints with space between edges of adjoining gypsum panels.
- F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.
 - 1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
 - 2. Fit gypsum panels around ducts, pipes, and conduits.
 - 3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.
- G. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments, except floors. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- H. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- I. Sound-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and with manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through assemblies, including sealing partitions above acoustical ceilings. The face layers of gypsum board at sound-rated assemblies shall be held back 1/4 inch from intersecting surfaces (floors, ceilings, and walls) and caulked airtight with acoustical sealant. Acoustically, it is only necessary for the face layers to be treated as such. Base layers should be butted into the intersecting surfaces.
- J. Install sound attenuation blankets before installing gypsum panels unless blankets are readily installed after panels have been installed on one side.

3.3 APPLYING INTERIOR GYPSUM BOARD

- A. Install interior gypsum board in the following locations:

1. Wallboard Type: Type X, unless otherwise noted.
- B. Single-Layer Application:
1. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing unless otherwise indicated.
 2. On partitions/walls, apply gypsum panels as required by fire-resistance-rated assembly, and minimize end joints.
 - a. Stagger abutting end joints not less than one framing member in alternate courses of panels.
 - b. At stairwells and other high walls, install panels horizontally unless otherwise indicated or required by fire-resistance-rated assembly.
 3. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
 4. Fastening Methods: Apply gypsum panels to supports with steel drill screws.
- C. Multilayer Application:
1. On ceilings, apply gypsum board indicated for base layers before applying base layers on walls/partitions; apply face layers in same sequence. Apply base layers at right angles to framing members and offset face-layer joints one framing member, 16 inches (400 mm) minimum, from parallel base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly.
 2. On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints, unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
 3. On Z-furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 4. Fastening Methods: Fasten base layers and face layers separately to supports with screws.
- D. Laminating to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members, or base layer of gypsum board), comply with gypsum board manufacturer's written recommendations and temporarily brace or fasten gypsum panels until fastening adhesive has set.

3.4 APPLYING TILE BACKING PANELS

- A. Glass-Mat, Water-Resistant Backing Panels: Comply with manufacturer's written installation instructions and install at locations indicated to receive tile or where shown. Install with 1/4-inch (6.4-mm) gap where panels abut other construction or penetrations.
- B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

3.5 INSTALLING TRIM ACCESSORIES

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- B. Interior Trim: Install in the following locations:
 - 1. Cornerbead: Use at outside corners, unless otherwise indicated.
 - 2. LC-Bead: Use at exposed panel edges.
 - 3. L-Bead: Use where indicated.
 - 4. U-Bead: Use where indicated.
- C. Aluminum Trim: Install in locations indicated on Drawings.

3.6 FINISHING GYPSUM BOARD

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 - 1. Level 1: Ceiling plenum areas, concealed areas, and where indicated.
 - 2. Level 2: Panels that are substrate for tile.
 - 3. Level 3: Where indicated on Drawings.
 - 4. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.
 - 5. Level 5: At all visible walls and at all ceilings and light coves.
 - a. Primer and its application to surfaces are specified in other Division 09 Sections.

3.7 PROTECTION

- A. Protect adjacent surfaces from drywall compound and promptly remove from floors and other non-drywall surfaces. Repair surfaces stained, marred, or otherwise damaged during drywall application.
- B. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- C. Remove and replace panels that are wet, moisture damaged, and mold damaged.
 - 1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.

2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION

SECTION 095113

ACOUSTICAL CEILING PANEL

PART 1 - GENERAL

1.1 RELATED DOUCMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.2 SUMMARY

- A. Work Included:
 - a. Suspended acoustical ceilings and suspension systems as shown in drawings.

1.3 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: Class A according to ASTM E 1264
 - b. Smoke-Developed Index: 50 or less
 - 1. Allowable Tolerances:
 - a. Deflection: Do not exceed a maximum of L/360 of span.
 - b. Level: Do not deviate from level in excess of 1/8 inch in 12 feet.

1.4 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating specified requirements.
- B. Closeout Submittals: Submit for Owner's documentation.
 - 1. Warranties.

1.6 QUALITY ASSURANCE

- A. Qualified Installer: Installer to have 5 years experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer.
- B. Single-Source Responsibility: Obtain each type of acoustical ceiling unit from single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of Work

- C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).
- D. Pre-Installation Meetings: Before the start of Work, meet at the Project site to review methods and sequence of installation, special details and conditions, quality standards, testing and quality control requirements, job organization and other pertinent topics related to the Work. The meeting shall include the Owner, Architect, Architect's consultants, Contractor, and subcontractors whose work is relevant to this Specification Section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Deliver acoustical ceiling units to Project site in original, unopened packages.
- B. Storage and Protection: Store acoustical ceiling units in fully enclosed space protected against damage from moisture, direct sunlight, surface contamination, and other causes.

1.8 PROJECT CONDITIONS

- A. Storage: Before installing acoustical ceiling units, permit them to reach room temperature and stabilized moisture content.
- B. Space Enclosure: Do not install acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those expected for final occupancy.

1.9 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner at Project site. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with appropriate labels.
- B. Acoustical Ceiling Units: Furnish quantity of full-size units equal to 2.0 percent of amount installed.

PART 2 - PRODUCTS

2.1 TILE MATERIALS

- A. Manufacturers: see Finish Schedule in Drawings for manufacturer and finish

2.2 CEILING SUSPENSION MATERIALS

- A. Grid Members: Manufacturer's standard, heavy duty, non-rated system per ASTM C635. Provide manufacturer's perimeter clip system to meet seismic design requirements.

- B. Perimeter Angles: With matching corner caps and splice pieces; same material as that of exposed suspension system members, 15-gauge with hemmed edge, typical.
- C. Slotted Angle Spacer: Slotted angles or channels with spring steel diamond points which snap tight to prevent movement of strut.
- D. Miscellaneous Accessories: Manufacturer's standard for use with suspension system furnished; furnish as required.
 - 1. Seismic Stabilizer Bars: Manufacturer's standard perimeter stabilizers designed to accommodate seismic forces.
 - 2. Seismic Struts: Manufacturer's standard compression struts designed to accommodate seismic forces.
 - 3. Seismic Clips: Seismic clips designed and spaced to secure acoustical panels in place.
- F. Hanger Wires: Soft-annealed galvanized steel complying with ASTM C636.
- G. Finish: Manufacturer's standard white low-gloss paint.
- H. Miscellaneous: Provide manufacturer's standard miscellaneous items and accessories suitable for use intended and required for complete installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine substrates and structural framing to which ceiling system attached or abuts, with Installer present, for compliance with requirements specified in this and other sections that affect installation and anchorage of ceiling system. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Install acoustical ceiling systems per Reference Standards and manufacturer's instructions.
- B. Acoustical Ceiling Suspension System:
 - 1. General: Install per Reference Standards, manufacturer's instructions, reviewed shop drawings.
 - 2. Main Grid Members:
 - a. Spacing: 4-foot maximum centers.
 - b. Attachment: Tie with hanger wire secured with not less than 3 turns in 1-1/2-inch maximum distance.
 - c. Lighting Fixtures, Air Terminals, and Other Services Less Than 56 Pounds in Weight: Secure with hanger wires at two corners.
 - 3. Secondary Grid Members:
 - a. Spacing: 2-foot maximum centers.
 - b. Attachment: Form 2-foot by 2-foot grid with positive splices.

C. Seismic Restraint:

1. General: Provide as follows for each type suspension system.
2. Spacing:
 - a. Areas Less Than 96-Square Feet:
 - 1) No Dimension Greater Than 12-Feet: No bracing required.
 - 2) Dimension Greater Than 12-Feet: Provide bracing.
 - b. Areas Greater Than 96-Square Feet: Provide brace for each 96-square feet or fraction thereof.
 - c. Maximum Brace Spacing: 8-feet by 12-feet.
 - d. Maximum Distance From Walls: 1/2-brace spacing in direction perpendicular to plane of wall.
 - e. Corridors:
3. Seismic Brace:
 - a. General: Provide compression post and four 12-gauge galvanized steel wires splayed at 45 degrees vertically and spaced at 90 degrees horizontally to each other and attached to main runner or grid member with 2-inches of compression post.
 - b. Wire Attachment: Powder-actuated devices not permitted for attachment of brace wires. Fasten bracing wires at each end with not less than 4 tight turns within distance of 1-1/2-inches, except machine made wire turns, where both strands have been deformed or bent in wrapping, need not comply with 1-1/2-inch distance requirement as long as turns are as tight as possible and 4 in number.

D. Acoustical Ceiling Tiles:

1. General: Lay-in tiles flat with edges resting on flanges of structural framing members and edge trim.

3.3 CLEANING

- A. Cleaning: Clean exposed surfaces of acoustical ceiling tiles. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 096513

RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient base.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, not less than 12 inches long.
- C. Samples for Initial Selection: For each type of product indicated.
- D. Samples for Verification: For each type of product indicated and for each color, texture, and pattern required in manufacturer's standard-size Samples, but not less than 12 inches long.
- E. Product Schedule: For resilient base and accessory products. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 10 linear feet for every 500 linear feet or fraction thereof, of each type, color, pattern, and size of resilient product installed.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F or more than 90 deg F.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F or more than 95 deg F, in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 95 deg F.
- C. Install resilient products after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 THERMOSET-RUBBER BASE

- A. Product: Refer to Finish Schedule on Drawings.
- B. Product Standard: ASTM F 1861, Type TS (rubber, vulcanized thermoset), Group I (solid, homogeneous).
 - 1. Style and Location:
 - a. Style A, Straight: Provide in areas with carpet.
 - b. Style B, Cove: Provide in areas with resilient flooring.
- C. Thickness: 0.125 inch.
- D. Height:
 - 1. 4 inches, typical
 - 2. 2.5 inches along exterior window wall at grid line E.
- E. Lengths: Coils in manufacturer's standard length.
- F. Outside Corners: Preformed.
- G. Inside Corners: Preformed.
- H. Colors: As indicated by manufacturer's designations.

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient-product manufacturer for applications indicated.
- B. Metal Edge Strips: Extruded aluminum with mill finish of width shown, of height required to protect exposed edges of flooring, and in maximum available lengths to minimize running joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 1. Installation of resilient products indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.
- B. Do not install resilient products until they are the same temperature as the space where they are to be installed.
 - 1. At least 48 hours in advance of installation, move resilient products and installation materials into spaces where they will be installed.
- C. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient products.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practical without gaps at seams and with tops of adjacent pieces aligned.

- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.
- G. Preformed Corners: Install preformed corners before installing straight pieces.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient products.
- B. Perform the following operations immediately after completing resilient-product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum horizontal surfaces thoroughly.
 - 3. Damp-mop horizontal surfaces to remove marks and soil.
- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Cover resilient products subject to wear and foot traffic until Substantial Completion.

END OF SECTION

SECTION 096519
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes:
 - 1. Rubber tile flooring in copy and break room.
- B. Work Specified Elsewhere:
 - 1. Section 096513 "Resilient Base and Accessories."

1.3 SUBMITTALS

- A. Product Data: For each type of product.
- B. Manufacturer's Installation Instructions.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of resilient flooring to include in maintenance manuals.
- B. Warranty: 10 year warranty commencing on Date of Substantial Completion

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for flooring installation.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by flooring manufacturer for installation techniques required.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store flooring and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 68 deg F .

- B. Material should be stored in areas that are fully enclosed and weathertight. The permanent HVAC should be fully operational and controlled for at least 48 hours prior to the installation.

1.7 FIELD CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 68 deg F , in spaces to receive flooring during the following time periods:
 - 1. 48 days before installation.
 - 2. During installation.
 - 3. 48 days after installation.
- B. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
- C. Do not install flooring over concrete substrates until substrates are dry to bond with adhesive as determined by resilient flooring manufacturer's recommended bond, moisture test, and pH test.
- D. Verify actual measurements/openings by field measurements before fabrication.
- E. Close spaces to traffic during flooring installation.
- F. Install flooring after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 RUBBER TILE FLOORING

- A. High resiliency thermoset rubber tile
- B. Manufacturer: Expanko XCR4
- C. Thickness: 1/8-inch (3.2 mm)
- D. Surface texture: smooth, medium gloss
- E. Size: see finish schedule

2.2 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient flooring manufacturer for applications indicated.
- B. Heat welding rod as required and recommended by Manufacturer.

- C. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit products and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
 - 1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of flooring.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to resilient flooring manufacturer's written instructions to ensure adhesion of flooring.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Remove substrate coatings and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient flooring manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient flooring manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 9 pH.
 - 4. Moisture Testing: Perform tests recommended by resilient flooring manufacturer, but not less stringent than the following:
 - a. Perform anhydrous calcium chloride test according to ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform relative humidity test using in situ probes according to ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level.
- C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.
- D. Do not install flooring until it is the same temperature as space where it is to be installed.

1. At least 72 hours in advance of installation, move flooring and installation materials into spaces where they will be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by flooring.

3.3 INSTALLATION, GENERAL

- A. Comply with manufacturer's written instructions for installing flooring.
- B. Scribe and cut flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings.
- C. Extend flooring into toe spaces, door reveals, closets, and similar openings.
- D. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- E. Install flooring on covers for telephone and electrical ducts and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of flooring installed on covers and adjoining flooring. Tightly adhere flooring edges to substrates that abut covers and to cover perimeters.
- F. Adhere flooring to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient flooring.
- B. Perform the following operations immediately after completing resilient flooring installation:
 1. Remove adhesive and other blemishes from exposed surfaces.
 2. Sweep and vacuum surfaces thoroughly.
 3. Damp-mop surfaces to remove marks and soil.
- C. Use 100-pound roller to secure and smooth tiles per manufacturer's recommendations.
- D. Remove excess adhesive before it cures.
- E. Protect resilient flooring from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- F. Close spaces to traffic for 72 hours after flooring installation.

END OF SECTION

SECTION 096813

TILE CARPETING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Carpet tile, complete, as shown and specified.
- B. Work Specified Elsewhere:
 - 1. Resilient Base and Accessories: Section 096513.

1.2 REFERENCES

- A. General: Comply with the applicable provisions of the referenced standards except as modified by governing codes and the Contract Documents. Where a recommendation occurs in the referenced standards, it shall be considered mandatory. In the event of conflict, the more stringent standard or requirement shall govern.
 - 1. Carpet and Rug Institute (CRI):
 - a. "The Carpet Specifier's Handbook".

1.3 SUBMITTALS

- A. Product Data: Submit for Architect's action. Submit manufacturer's literature and installation instructions for each material and accessory, clearly notating specified requirements.
- F. Closeout Submittals: Submit for Owner's documentation.
 - 1. Warranties.
 - 2. Maintenance Data. Include recommendations for commercial cleaning, spot cleaning, vacuum cleaning, and maintenance schedule. Provide precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.4 QUALITY ASSURANCE

- A. Qualified Installer: Certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Packing, Shipping, Handling, and Unloading: Take measures as required to ensure materials are not damaged or deformed.
- B. Storage and Protection: Store products in flat position in properly ventilated, dry space. Use suitable means to prevent materials from lying in direct contact with the ground.

1.6 WARRANTY

- A. Warranty: Submit for Owner's documentation. Warranty shall be for a 10 year period, signed by the Contractor, manufacturer, and installer, against defects in materials or workmanship. Make repairs and replacements upon notification of defects.

1.7 MAINTENANCE

- A. Extra Materials: Wrap, label with carpet type, pattern, and color, and store as directed by Owner. Provide minimum of twelve full-size carpet tiles of each type.

PART 2 – PRODUCTS

2.1 CARPET TILE

- A. Carpet: See finish schedule for carpet types, manufacturer and style number.

2.2 INSTALLATION ACCESSORIES

- A. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
- B. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Prior to start of Work, examine surfaces to receive carpet and verify that surfaces are clean, dry, sound, level and free of oil, grease, wax, and other foreign matter that would impair installation. Do not start Work until unsatisfactory conditions are corrected.
- B. Allow carpet and adhesive materials to reach a minimum temperature of 65 degrees Fahrenheit or minimum temperature recommended by manufacturer 48 hours immediately prior to installation.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level holes and depressions 1/8 inch wide or wider and protrusions more than 1/32 inch unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil, and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Carpet Tile Installation: Comply with CRI 104, Section 14 "Carpet Modules" and the following:
 - 1. Install a test sample to demonstrate proper adhesion and removal capability of bonding system. Cut and dry-fit sections of carpet prior to application of adhesive. Apply adhesive complying with procedure demonstrated to be satisfactory by test sample.
- B. Installation Method: As recommended in writing by carpet tile manufacturer.
- C. Maintain dye lot integrity: do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-staining marking device.
- G. Install pattern parallel with wall and borders.

3.4 CLEANING

- A. Debris: Remove rubbish, wrapping paper, salvages, and scrapes less than 2 feet square or less than 8 inches in least dimension.
- B. Vacuuming: Upon completion, vacuum with commercial beater bar type vacuum cleaner.
- C. Protection: After each area of carpet has been installed, protect from soiling and damage until acceptance by Owner.

3.5 PROTECTION

- A. Protect installed carpet tile to comply with CRI 104, Section 16 "Protecting Indoor Installations"
- B. Perform the following operations immediately after installing carpet tile:
 - 1. Remove yarns that protrude from carpet tile surface.
 - 2. Vacuum carpet tile using commercial machine with face-beater element.
- C. Ensure that carpet will be clean and without deterioration or damage at date of substantial completion.

END OF SECTION

SECTION 099100

PAINTING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Interior painting.
 - 2. Exterior painting.
 - 3. Wood Staining.
- B. Related Requirements:
 - 1. Section 074400 "Cementitious Panels"
 - 2. Section 074600 "Wood Siding"
 - 3. Section 081113 "Wood Flush Doors and Metal Frames"

1.2 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.3 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2014.
- C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.
- D. GreenSeal GS-11 - Paints and Coatings; 2013.
- E. Architectural Painting Specification Manual by the Master Painters Institute (MPI)

1.4 SYSTEM DESCRIPTION

- A. General: Paint every interior and exterior surface, except as otherwise shown or as follows:
- B. Surfaces Not to be Painted:
 - 1. Factory-finished items specified in various Sections.

2. Prefinished floor coverings.
3. Painting specified elsewhere and included in respective Sections, including but not necessarily limited to, shop priming.
4. Code-Required Labels: Keep equipment identification and fire rating labels free of paint.
5. Surfaces concealed in walls and above ceilings except as specifically indicated otherwise.
6. Ducts, piping, conduit, and equipment concealed in walls and ceilings, unless specifically indicated otherwise.

1.5 SUBMITTALS

- A. Product Data: Provide complete list of all products to be used, with the following information for each:
 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 2. MPI product number (e.g. MPI#47).
 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 4. Manufacturer's installation instructions.
- B. If proposal of substitutions is allowed under submittal procedures, explanation of all substitutions proposed.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 1. Where sheen is specified, submit samples in only that sheen.
 2. Where sheen is not specified, discuss sheen options with Architect before preparing samples, to eliminate sheens definitely not required.
- D. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.
- E. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.
- F. Manufacturer's Instructions: Indicate special surface preparation procedures.
- G. Maintenance Materials: Furnish the following for the City of Oregon City's use in maintenance of project.
 1. Extra Paint and Coatings: 1 gallon of each color; store where directed.
 2. Label each container with color, type, texture, and room locations in addition to the manufacturer's label.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.
- B. Field Mockup: For all new paint colors prepare mockup surface for the color designated for that wall on at least 30 sq. ft. of surface.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.8 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Provide all paint and coating products from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide all specified products, minor exceptions will be permitted provided approval by Engineer of Record is obtained using the specified procedures for substitutions.
 - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- C. Paints:
 - 1. Sherwin-Williams Company: www.sherwin-williams.com.
 - 2. Miller Paint: www.millerpaint.com.
- D. Primer Sealers: Same manufacturer as top coats.

2.2 CHEMICAL REMOVAL MATERIALS

- A. Cleaning Solutions: Mild Detergent: Degreasing cleansing agent commercially available such as "TSP Substitute, Heavy Duty Cleaner", manufactured by Bondex International.

Other products manufactured by other manufacturers may be used provided they can be shown to perform equally to the specified product. TSP shall not be used. Cleaning solutions shall not leave residue on surface to be painted. Use detergent in Solution recommended by detergent manufacturer.

- B. Chemical Removal: Removed shall not be flammable nor contain methylene chloride carcinogens or any other OSHA regulated substance (per 29CFE1910.1001-1052). Remover shall remove all paint from substrate, leave no residue and require minimal additional surface preparation. Sheet Metal Paint Stripper: Prosoco, Incorporated, "Sure-Klean T1375" paint stripper specifically designed to remove coatings from metal surfaces and recommended for use for applications indicated for this project. Other products manufactured by other manufacturers may be used provided they can be shown to perform equally to the specified product.

2.3 TOOLS AND EQUIPMENT FOR PAINT REMOVAL

- A. Power tools include rotary wire brushed, cup brushes, power sanders, power grinding or power brushing tools. Portable power tools shall be used with filter vacuum attachments.
- B. Wet Sanding and Wet Scraping: Whenever sanding materials and scrapers are used, use wet methods. Use misters to dampen the surface before sanding or scraping. Use water mist for wet sanding. (Exception: Chemical removal methods.)

2.4 EQUIPMENT FOR PAINTING

- A. Painting and Decorating Equipment: To best trade standards for type of product and application.
- B. Spray Painting Equipment: Of ample capacity, suited to the type and consistency of paint or coating being applied and kept clean and in good working order at all times.

2.5 FINISH AND COLORS

- A. Refer to Color and Material Schedule and Drawings for identification and location of colors.

2.6 PAINTS AND COATINGS –GENERAL

- A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
 - 1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
 - 2. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
 - 3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 - 4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 - 5. Supply each coating material in quantity required to complete entire project's work from a single production run.
 - 6. Do not reduce, thin, or dilute coatings or add materials to coatings unless such

procedure is specifically described in manufacturer's product instructions.

- B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
- C. Volatile Organic Compound (VOC) Content:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. Architectural coatings VOC limits of Oregon.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
- D. Chemical Content: The following compounds are prohibited:
 - 1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 - 2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.
- E. Flammability: Comply with applicable code for surface burning characteristics.
- F. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.
- G. Colors: As indicated on drawings

2.7 PAINT SYSTEMS - EXTERIOR

- A. Structural Steel and Metal Fabrications: (including steel doors and frames).
 - 1. 2 Alkyd Coats (over alkyd primer).
 - 2. Finish Sheen: Gloss Level 5
 - a. Primer: S-W Kem Kromik Universal Metal Primer D50WZ1
 - b. Finish: S-W Direct-to-Metal Enamel Alkyd Semi-Gloss B55 Series
- B. Galvanized-Metal Substrates: (including metal deck and hollow metal frames)
 - 1. 2 Alkyd Coats (over acrylic primer).
 - 2. Finish Sheen: Gloss Level 5
 - a. Primer: S-W Pro Industrial Pro-Cryl Universal Acrylic Primer B66-310 Series

- b. Finish: S-W Direct-to-Metal Enamel Alkyd Semi-Gloss B55 Series
- C. Aluminum
 - 1. 2 Alkyd Coats (over wash primer).
 - 2. Finish Sheen: Gloss Level 5
 - a. Primer: S-W DTM Wash Primer, B71Y1
 - b. Finish: S-W Direct-to-Metal Enamel Alkyd Semi-Gloss B55 Series
- D. Dressed Lumber: to be Painted (including fascia boards, wood doors, frames, and window trim)
 - 1. 2 100% Acrylic coats (over alkyd primer)
 - 2. Finish Sheen: Gloss Level 5
 - a. Primer: S-W Exterior Oil-Based Wood Primer, Y24 Series
 - b. Finish: S-W Solo 100% Acrylic Int/Ext Semi-Gloss, A76 Series
- E. Wood Paneling: to be Stained
 - 1. 2 Coats: Stain, exterior, solvent based, semi-transparent
 - 2. Finish Sheen: Gloss Level 1
 - a. Stain: See Finish Schedule
 - b. Finish: S-W SuperDeck Oil-Base Semi-Transparent Stain
- F. Cement Board Substrates:
 - 1. 2 100% Acrylic coats (over alkyd primer)
 - 2. Finish Sheen: Gloss Level 5
 - a. Primer: S-W Loxon Concrete & Masonry Primer A24W8300, (unless factory primed)
 - b. Finish: S-W Solo 100% Acrylic Int/Ext Semi-Gloss, A76 Series

2.8 PAINT SYSTEMS - INTERIOR

- A. Structural Steel and Metal Fabrications
 - 1. Water-Based Light Industrial Coating System:
 - a. Prime Coat: Primer, rust-inhibitive, water based MPI#107 or Shop Primer
 - b. Intermediate Coat: Light industrial coating, interior, matching topcoat.
 - c. TopCoat: Light industrial coating, interior, water based (Gloss Level 3), MPI #151
- B. Galvanized Metal: (steel, pipes, overhead decking, ducts)
 - 1. Water-Based Light Industrial Coating Over Waterborne Primer System:

- a. Prime Coat: Primer, galvanized, water based MPI #134
 - b. Intermediate Coat: Light industrial coating, interior, waterbased, matching topcoat.
 - c. TopCoat: Light industrial coating, interior, water based (Gloss Level 3), MPI #151
- C. Dressed Lumber exposed to view: (casings, molding, and trim)
 - 1. Latex System:
 - a. Prime Coat: Primer, Latex, for interior wood, MPI #39
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. TopCoat: Latex, interior, (Gloss Level 4), MPI #43
- D. Gypsum:
 - 1. Latex System:
 - a. Prime Coat: Primer sealer, latex, interior, MPI #50
 - b. Intermediate Coat: Latex, interior, matching topcoat
 - c. TopCoat: Latex, interior, (Gloss Level 4), MPI #43
- E. Finish Carpentry Substrates to receive stain:
 - 1. Moisture-Cured Clear Polyurethane Over Stain System: MPI INY 6.3Y.
 - a. Stain Coat: Interior wood stain (semi-transparent)
 - b. Three Finish Coats: Moisture-cured clear polyurethane flat.

2.5 ACCESSORY MATERIALS

- A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
- B. Patching Material: Latex filler.
- C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect/Engineer of Record of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Gypsum Wallboard: 12 percent.
 - 2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to these specifications and manufacturer's instructions for each particular substrate condition.
 - 1. Provide barrier coats over incompatible previously painted surfaces or primers or remove coats and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material over substrates previously finished.
- B. Sound Existing Paint Including Tightly Adhered Paint Film: Wash areas to be repainted; use mild detergent solution, and then rinse with clean water until all detergent has been removed. Remove dirt and chalk from the surface without damaging the substrates or adjacent areas. Washed areas shall be permitted to dry thoroughly before painting is started.
- C. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer.
- D. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- E. Wood Substrates:
 - 1. Scrape and clean knots. Before applying primer, apply coat of knot sealer recommended in writing by topcoat manufacturer for exterior use in paint system indicated.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.
- F. Moderately Deteriorated Paint Including Cracked or Loose Paint Film: The areas to be painted shall be treated as per "Sound Existing Paint" above. After washing, the areas shall be carefully examined for cracking, blistering, peeling or flaking paint. All loose, unsound, non-adhering paint shall be removed from such areas. Thick edges (multiple coats of remaining old paint) shall be scraped to smooth the edges. The surface shall then

be wiped clean to remove remaining dust that would prevent paint adhesion.

- G. Severely Deteriorated Paint Including Extensive Cracked and Loose Paint Film: Remove old paint film down to bare substrate by using one, or a combination of the following methods:
 - 1. Hand tool removal, scraping and wet sanding
 - 2. Power tool cleaning using low-dust emission methods
 - 3. Chemical Removal
- H. The selection of the specific means and methods of surface preparation system shall be the responsibility of the Contractor, provided surface preparation is within the appropriate code classification.

3.3 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's instructions.
- C. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
- D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- E. Apply each coat to uniform appearance.
- F. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FIELD QUALITY CONTROL

- A. Tolerances: Final application shall match color and texture of approved samples and shall be smooth, uniform in appearance, color, texture, sheen, and shall be free of runs, sags, holidays, lap marks, air bubbles, pin holes, and other detrimental effects in accordance with requirements of the MPI and this Specification.

3.5 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.6 PROTECTION

- A. Protect surrounding areas and adjacent surfaces to prevent damage or spattering of paint during painting work. Correct damage by cleaning, repairing or replacing, and repainting.
- B. As work proceeds, promptly remove spilled or splattered paint materials by methods that do not damage surfaces. During progress of work keep premises free from unnecessary accumulation of tools, equipment, surplus materials, debris, and the like.
- C. Provide drop cloths, shields, and protective equipment.
- D. Cover all air vents and registers with 6 mil polyethylene sheet taped to prevent dust from entering ventilation system. After removal of polyethylene sheet protection, prepare and refinish covered surfaces.
- E. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixture escutcheon plates, and similar items in place that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Following completion of painting operations in each space or area, have reinstall items and remove surface-applied protection.
- F. No dust or odors may leave the work area. Construct critical barriers and seal off openings and penetrations into the work areas, including doorways and windows. Use polyethylene plastic sheeting on wood studs if necessary; lap and tape joints of sheeting to prevent dust, particles and fumes from leaving the enclosed areas.
- G. Protect finished coatings until completion of project.
- H. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 101400

SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Exterior metal entry signage
 - 2. Exterior aluminum post signs
 - 3. Interior room signs

1.3 REFERENCES

- A. General: Comply with the applicable provisions of the referenced standards, except as modified by governing codes and the Contract Documents. Where a recommendation occurs in the referenced standards, it shall be considered mandatory. In the event of conflict, the more stringent standard or requirement shall govern.
 - 1. Americans with Disabilities Act of 2010 (ADA): Comply with relevant chapters related to signage.
 - 2. Oregon Structural Specialty Code, 2014 edition.

1.4 SUBMITTALS

- A. Product Data: Submit for Architect's action. Manufacturer's specifications, catalog cuts, standard details, and installation instructions. Provide manufacturer's standard symbols and colors for Architect's selection.
- D. Shop Drawings: Submit for Architect's action. Show materials; construction; special details; and type, location, and attachment of hardware and accessories.
- F. Closeout Submittals: Submit for Owner's documentation.
 - 1. Warranties:
 - 2. Maintenance Data:

1.5 QUALITY ASSURANCE

- A. Qualified Installer: Installer to have 5 years experience in the installation of specified materials on comparable projects. The firm shall have the approval of the materials manufacturer.
- B. Regulatory Requirements: Comply with applicable requirements of the laws, codes, and regulations of Authorities Having Jurisdiction (AHJs). Obtain necessary approvals from AHJs.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials in original protective packaging, with each package clearly identified with manufacturer's name, type and name of product, color, and location for installation.
- B. Storage: Store materials in manner to prevent twisting, bending, or other damage.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers
 - 1. Basis of Design: Impactsigns.com, Cut Bronze Letters & Metal Plaques, or approved equal

2.2 TYPES

- A. S1: Exterior Entry Plaque and Individual letters.
 - 1. Exterior logo: 12" tall, ¼" thick, Cast Bronze Plaque, logo and finish to be provided by architect.
 - 2. Cut Bronze Letters: 3" tall, ¼" thick, bronze material, dark oxidized finish, Architectural font, mounted with 1" stud and ¼" spacer
 - 3. Cut Bronze Numbers: 6" tall, ¼" thick, bronze material, dark oxidized finish, Architectural font, mounted with 1" stud and ¼" spacer.
 - 4. See drawings for additional information.
- B. S2: Aluminum Plaque with cast aluminum alloy mounting bracket
 - 1. Baked enamel finish, .040 aluminum sheet with rounded corners. Provide galvanized post as necessary.
 - 2. Signs, as indicated on drawings:
 - a. Entry sign on Warner Parrot Road: Aluminum sign mounted on existing steel post.
 - b. Staff Parking Only sign: Aluminum sign mounted on steel post with concrete base.
- C. S3: Interior plaque signs
 - 1. Laminated, non-glare polycarbonate sheet plastic, 1/4-inch thick, letterstyle and two colors as selected. Letters, numbers and pictograms shall be back painted, with contrasting background color.
 - 2. Provide room signage for all new rooms.

2.2 MISCELLANEOUS MATERIALS

- A. Adhesives: Types best suited for the purpose.
- B. Fasteners: Types recommended by manufacturer for intended use.

PART 3 - EXECUTION

3.1 GENERAL

- A. Manufacturer's Instructions: Prepare substrates and install the work, including components and accessories in accordance with the manufacturer's instructions, except where more stringent requirements are shown or specified. Examine the areas to receive the Work and remedy detrimental conditions.

3.2 INSTALLATION

- A. General: Install signs only after surfaces on which they are to be mounted are painted and finished. Install signs plumb, level, true, square and securely attached per manufacturer's recommendations.
- B. Location: Mount signs centered at 60 inches above finished floor and on centerline door, unless otherwise noted on Drawings.
- C. Attachment: Concealed type as recommended by sign manufacturer for type of substrate involved.

3.3 CLEANING AND PROTECTION

- A. General: Clean soiled surfaces, including surrounding wall surfaces, per manufacturer's recommendations.
- B. Protection: Protect the Work during erection and construction to avoid non-uniformity of appearance or other defects in the Work. Remove protection when no longer required.

END OF SECTION

SECTION 105113

METAL LOCKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Metal lockers

1.3 SUBMITTALS

- A. Product Data: For product types
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of metal locker.
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available.
- C. Product Schedule: For lockers
- D. Qualification Data: For Installer.
- E. Sample Warranty: For special warranty.
- F. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.
- B. Locker components shall be stored flat, if shipped unassembled, until assembly. All finishes shall be protected from soiling and damage during handling.

- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual dimensions of recessed openings by field measurements before fabrication.

1.6 COORDINATION

- A. Coordinate sizes and locations of bases for metal lockers.
- B. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of work specified in other Sections to ensure that metal lockers can be supported and installed as indicated.

1.7 WARRANTY

- A. Manufacturer's standard warranty to repair or replace components of locker products that fail in materials or workmanship within 3 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Salsbury Industries, 1010 East 62nd Street; Los Angeles, CA 90001-1598; Toll Free Telephone: 1-800-LOCKERS (1-800-562-5377); Fax: 1-800-562-5399; Email: salsbury@lockers.com; Website: www.lockers.com.

2.2 LOCKERS

- A. Double-tier extra wide standard metal lockers: Constructed of 16 gauge steel; durable powder coated finish; includes a lift up handle and recessed hasp for added security; can accommodate built-in combination locks, built-in key locks, combination padlocks, key padlocks or factory installed resettable combination locks.
 - 1. Extra Wide Standard Metal Locker Series: 52000 series: Double-tier.
 - 2. Unit Width: 12 inches (381 mm).
 - 3. Unit Height: 78 inches (1,981 mm) with legs.
 - 4. Unit Depth: 15 inches (381 mm).

5. Unit Assembly: Assembled units.
6. Unit Color: Architect to select.

2.3 INTERIOR EQUIPMENT

- A. Standard Hardware Features:
 1. Padlock hasp.
 2. One top-mounted, two-pronged stainless steel coat hook.
 3. Three wall-mounted, single-prong stainless steel coat hooks.
 4. Horizontal venting.
 5. Five knuckle door hinges.

2.4 CONSTRUCTION

- A. Locker Doors: Steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
 1. Door:
 - a. 16 gauge - .060 inch (1.52 mm) thick steel.
 - b. Holes provided for attaching number plates.
 2. Ventilation: Vents provided on each door in Salsbury Industries' standard louver pattern.
 - a. Double-tier lockers – 6 feet high units: Four 5-3/4 inch (146 mm) louvers top and bottom.
 3. Multi-Point Latch: Full channel formation of adequate depth to fully conceal lock bar on lock side, channel formation on hinge side, right angle formations across top and bottom.
- B. Locker Body: Solid steel specially formed for added strength and rigidity and to ensure tight joints at fastening points.
- C. Hinges: Hinge: 0.074 inch (1.88 mm) thick sheet steel, double spun, full loop, tight pin, projection welded to door frame and securely fastened to the door.
 1. Single-tier lockers: Three 2 inch (51 mm) high five-knuckle hinges.
 2. Double-tier & triple-tier lockers: Two 2 inch (51 mm) high five-knuckle hinges.
- D. Optional factory assembly of locker bodies using heavy duty steel rivets.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's installation instructions.
- B. Anchor the units to the wall studs through the locker back and to the floor.
- C. Lockers can be either floor-mounted or installed on concrete or wood bases as scheduled or indicated. Floor or base shall be level for proper installation.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 107500

FLAGPOLE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Aluminum Flagpoles.

1.3 SUBMITTALS

- A. Product Data: Provide data on pole, accessories, and configurations.
- B. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.
- C. Operation Data: Provide operating data for the controller and timer.
- D. Maintenance Data: Provide lubrication and periodic maintenance requirement schedules and manuals.

1.4 QUALITY ASSURANCE

- A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed Oregon.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Spiral wrap flagpole with protective covering and pack in protective shipping tubes or containers.
- B. Protect flagpole and accessories from damage or moisture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Flagpoles:
 - 1. 1. American Flagpole: www.americanflagpole.com.
 - 2. 2. Substitutions: See Section 016200 - Product Requirements.

2.2 FLAGPOLES

- A. Flagpoles: Designed in accordance with NAAMM FP 1001.
 - 1. Material: Aluminum.
 - 2. Design: Straight shaft.
 - 3. Mounting: Ground mounted type.
 - 4. Nominal Height: 25ft; measured from nominal ground elevation.
- B. Performance Requirements:
 - 1. Wind Pressure Loading on Flagpole with Flag: Resistant without permanent deformation to 200 miles/hr wind speed, in accordance with NAAMM FP 1001; the factor of safety used is 2.5.

2.3 POLE MATERIALS

- A. Aluminum: ASTM B241/B241M, 6063 alloy, T6 temper.
- B. Steel: ASTM A53/A53M, Type S, Grade B.
- C. Stainless Steel: ASTM A312/A312M TP304 grade.
- D. Glass Fiber: Woven glass fiber roving, reinforced polyester resin composition, axial tensile strength of 40,000 psi minimum.

2.4 ACCESSORIES

- A. Finial Ball: Gold Anodized.
- B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
- C. Cleats: 9 inch size, aluminum with galvanized steel fastenings, two per halyard.
- D. Cleat Box: Aluminum, with built-in hinge and hasp assembly, attached to pole with tamper proof screws inside box.
- E. Halyard: 5/16 inch diameter polypropylene, braided, white.
- F. Connecting Sleeve For Multiple Section Poles: Same material as pole, precision fit for field assembly of pole, concealed fasteners.

2.5 MOUNTING COMPONENTS

- A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gage, 0.0598 inch steel, galvanized, depth of ____ inches as indicated.
- B. Pole Base Attachment: Flush; steel base with base cover.

2.6 FINISHING

- A. Metal Surfaces in Contact With Concrete: Asphaltic paint.
- B. Concealed Steel Surfaces: Galvanized to ASTM A123/A123M requirements.
- C. Aluminum: Mill finish.
- D. Stainless Steel: No. 4 satin finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPERATION

- A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.3 INSTALLATION

- A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.
- B. Fill foundation tube sleeve with concrete.
- C. Install foundation plate and centering wedges for flagpoles base set in concrete base and fasten.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1 inch.

3.5 ADJUSTING

- A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

SECTION 122400
WINDOW SHADES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Manually-operated roller shades with single rollers.

1.3 SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include styles, material descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions for roller shades.
- B. Shop Drawings: Show fabrication and installation details for roller shades, including shadeband materials, their orientation to rollers, and their seam and batten locations.
- C. Samples: For each exposed product and for each color and texture specified, 10 inches long. Samples for Initial Selection: For each type and color of shadeband material.
 - 1. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type of roller shade.
 - 1. Shadeband Material: Not less than 10 inches square. Mark inside face of material if applicable.
 - 2. Roller Shade: Full-size operating unit, not less than 16 inches wide by 36 inches long for each type of roller shade indicated.
 - 3. Installation Accessories: Full-size unit, not less than 10 inches long.
- E. Roller-Shade Schedule: Use same designations indicated on Drawings.
- F. Qualification Data: For Installer.
- G. Product Certificates: For each type of shadeband material, signed by product manufacturer.
- H. Maintenance Data: For roller shades to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of products.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roller shades in factory packages, marked with manufacturer, product name, and location of installation using same designations indicated on Drawings.

1.6 FIELD CONDITIONS

- A. Environmental Limitations: Do not install roller shades until construction and finish work in spaces, including painting, is complete and dry and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Field Measurements: Where roller shades are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Allow clearances for operating hardware of operable glazed units through entire operating range. Notify Architect of installation conditions that vary from Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: MechoShade Systems, Inc. or equal
- B. Source Limitations: Obtain roller shades from single source from single manufacturer.

2.2 MANUALLY OPERATED SHADES WITH SINGLE ROLLERS

- A. Chain-and-Clutch Operating Mechanisms: With continuous-loop bead chain and clutch that stops shade movement when bead chain is released; permanently adjusted and lubricated.
 - 1. Bead Chains: Stainless steel.
 - a. Loop Length: Full length of roller shade.
 - b. Limit Stops: Provide upper and lower ball stops.
 - c. Chain-Retainer Type: Clip, jamb mount.
- B. Rollers: Corrosion-resistant steel or extruded-aluminum tubes of diameters and wall thicknesses required to accommodate operating mechanisms and weights and widths of shadebands indicated without deflection. Provide with permanently lubricated drive-end assemblies and idle-end assemblies designed to facilitate removal of shadebands for service.
 - 1. Roller Drive-End Location: Right side of inside face of shade.

2. Direction of Shadeband Roll: Manufacturer's Standard method.
 3. Shadeband-to-Roller Attachment: Manufacturer's standard method.
- C. Mounting Hardware: Brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting location and conditions indicated.
- D. Roller-Coupling Assemblies: Coordinated with operating mechanism and designed to join up to three inline rollers into a multiband shade that is operated by one roller drive-end assembly.
- E. Shadebands:
1. Shadeband Material: Light-filtering fabric.
 2. Shadeband Bottom (Hem) Bar: Steel or extruded aluminum.
 - a. Type: Enclosed in sealed pocket of shadeband material.
 - b. Color and Finish: As selected by Architect from manufacturer's full range.
- F. Installation Accessories:
1. Fascia: continuous removable extruded aluminum fascia that attaches to shade mounting brackets without the use of adhesives, magnetic strips, or exposed fasteners.
 - a. Fascia shall be able to be installed across two or more shade bands in one piece.
 - b. Fascia shall fully conceal brackets, shade roller and fabric on the tube.
 - c. Provide bracket/fascia end caps where mounting conditions expose outside of roller shade brackets.
 - d. Notching of fascia for manual chain will not be acceptable.

2.3 ROLLER-SHADE FABRICATION

- A. Product Safety Standard: Fabricate roller shades to comply with WCMA A 100.1, including requirements for flexible, chain-loop devices; lead content of components; and warning labels.
- B. Unit Sizes: Fabricate units in sizes to fill window and other openings as follows, measured at 74 deg F:
1. Between (Inside) Jamb Installation: Width equal to jamb-to-jamb dimension of opening in which shade is installed less 1/4 inch per side or 1/2-inch total, plus or minus 1/8 inch. Length equal to head-to-sill or -floor dimension of opening in which shade is installed less 1/4 inch, plus or minus 1/8 inch.
- C. Shadeband Fabrication: Fabricate shadebands without battens or seams to extent possible except as follows:
1. Vertical Shades: Where width-to-length ratio of shadeband is equal to or greater than 1:4, provide battens and seams at uniform spacings along shadeband length to ensure shadeband tracking and alignment through its full range of movement without distortion of the material.
 2. Railroaded Materials: Railroad material where material roll width is less than the required width of shadeband and where indicated. Provide battens and seams

as required by railroaded material to produce shadebands with full roll-width panel(s) plus, if required, one partial roll-width panel located at top of shadeband.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, operational clearances, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ROLLER-SHADE INSTALLATION

- A. Install roller shades level, plumb, and aligned with adjacent units according to manufacturer's written instructions.
- B. Electrical Connections: Connect motor-operated roller shades to building electrical system.

3.3 ADJUSTING

- A. Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

- A. Clean roller-shade surfaces after installation, according to manufacturer's written instructions.
- B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that roller shades are without damage or deterioration at time of Substantial Completion.
- C. Replace damaged roller shades that cannot be repaired, in a manner approved by Architect, before time of Substantial Completion.

3.5 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller shades.

END OF SECTION

SECTION 20 10 00

GENERAL MECHANICAL PROVISIONS

Part 1 - General

1.01 CONTRACT CONDITIONS

- A. Work of this Division is bound by the Provisions of Division 1 bound herewith, in addition to these Specifications and accompanying Drawings.

1.02 SECTION INCLUDES

- A. General requirements specifically applicable to Division 20, 22 and 23 sections, which apply in addition to Division 1 - General Requirements.

1.03 DRAWINGS AND SPECIFICATIONS

- A. The Drawings and Specifications are complimentary, and what is called for by one shall be as binding as if called for by both.
- B. Use of the word "Provide" shall be equivalent to "Furnish and Install."
- C. Use of singular or plural in article, paragraph, and subparagraph headings does not indicate numbers of products required. Example: The heading "Chiller" does not necessarily mean there is only one chiller required.
- D. Abbreviations:
 - 1. ADA: Americans with Disabilities Act
 - 2. AASHTO: American Association of State Highway and Transportation Officials
 - 3. ASTM: American Society for Testing and Materials
 - 4. AWWA: American Water Works Association
 - 5. ANSI: American National Standards Institute
 - 6. NEMA: National Electrical Manufacturers' Association
 - 7. ASME: American Society of Mechanical Engineers
 - 8. UL: Underwriters' Laboratories
 - 9. IAPMO: International Association of Plumbing and Mechanical Officials
 - 10. Fed. Spec.: Federal Specifications
 - 11. MSS: Manufacturers' Standardization Society of the Valve and Fitting Industry
 - 12. WOG: Non-shock Water-Oil-Gas maximum working pressure rating
 - 13. NFPA: National Fire Prevention Association
 - 14. FM: Factory Mutual
 - 15. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association
 - 16. ARI: Air Conditioning and Refrigeration Institute
 - 17. AMCA: Air Movement and Control Association
 - 18. TIMA: Thermal Insulation Manufacturers' Association
 - 19. ASHRAE: American Society of Heating, Refrigerating, and Air Conditioning Engineers
 - 20. AABC: Associated Air Balance Council
 - 21. NEBB: National Environmental Balancing Bureau
- E. For products specified by listing one or more manufacturers, followed by "Similar to" and one manufacturer's model number, the following requirements apply:
 - 1. Approval of each listed manufacturer is contingent upon that manufacturer having a product which meets the specification, fits the available space, and is comparable to the listed model.

2. Electrical requirements, duct connections, pipe connections, and space requirements indicated on Drawings are based on the listed model. Provide revisions required to accommodate the model actually furnished.
- F. For products specified by listing one or more manufacturers, followed by a model number for each manufacturer, the following requirements apply:
1. Provide one of the listed model numbers or an approved substitution.
 2. Electrical requirements, duct connections, pipe connections, and space requirements indicated on Drawings are based on one of the listed models, and may not be suitable for all models listed. Provide revisions required to accommodate the model actually furnished.
- 1.04 PERMITS, FEES, AND GOVERNING AGENCIES
- A. Obtain permits and pay fees required by governing agencies.
 - B. Minimum requirements not otherwise stated herein shall meet governing codes and standards.
 - C. Arrange and pay for inspections and tests required by applicable codes and ordinances.
- 1.05 SITE VISITATION AND FIELD MEASUREMENTS
- A. Examine site of proposed Work to verify conditions. Beginning of Work means acceptance of conditions.
 - B. If conditions differ substantially from conditions indicated on Drawings, notify Architect before commencing Work.
- 1.06 SUBSTITUTIONS
- A. Substitution requests will not be considered unless they are submitted in writing, in accordance with Division 0 and Division 1.
 - B. Substitution requests will not be considered unless they include the following:
 1. Model numbers of proposed substitutions.
 2. Options that are required to make the proposed substitution comply with Specifications.
 3. Summary of modifications of the Work that are required to accommodate the proposed substitution.
- 1.07 OWNER FURNISHED ITEMS
- A. Refer to Division 1.
- 1.08 ALTERNATES
- A. Refer to Division 1.
- 1.09 PROJECT MANAGEMENT AND COORDINATION
- A. Provide coordination for the Work of Divisions 20, 22 and 23 in accordance with Division 1.
 - B. Locations shown on Drawings are approximate and are not intended to fully coordinate the Work of all Sections. Plan exact locations based on field measurements of field conditions and the Work of other Sections.

- C. Drawings do not show all required duct and pipe offsets and fittings. Provide offsets and fittings as required to coordinate with the Work of other Sections and with field conditions.
 - D. Locate equipment, piping, valves, dampers, etc. to provide adequate space for normal operating and maintenance activities.
- 1.10 CUTTING AND PATCHING
- A. Provide cutting and patching for the Work of Divisions 20, 22 and 23 in accordance with Division 1.
- 1.11 SHOP DRAWINGS AND PRODUCT DATA
- A. Provide shop drawings and product data for the Work of Divisions 20, 22 and 23 in accordance with Division 1. Refer to each Section for required shop drawings and product data submittals.
 - B. Acceptable Submittal Formats: Hard-Copy, or Electronic. If Electronic format is selected, at least one Hard-Copy of the information must be submitted with the Electronic copies to the Engineer (the Hard-Copy will not be returned).
 - C. Submittal formats shall conform with the following requirements:
 - 1. Each hard-copy Submittal package shall be formatted as follows:
 - a. Use three-ring loose leaf binders.
 - b. Provide index referencing specification section and page.
 - c. Tab individual sections.
 - 2. Each Electronic Submittal package shall be formatted as follows:
 - a. The full extent of the submitted data shall be presented in a single electronic file on a CD-ROM.
 - b. File Format Type: Adobe pdf, or universally readable equivalent.
 - c. Scanned information: Minimum 400 dpi.
 - d. Provide index referencing specification section and page.
 - e. Bookmark individual sections.
 - f. One file per CD-ROM.
 - 1) Format CD-ROM for use in PC compatible hardware
 - 2) Format CD-ROM so that additional files may be written to it (read-write).
 - D. Contractor may provide one (1) early submittal for items with long lead times as determined by the Contractor. The submittal shall be clearly identified as "Long Lead Time Item Submittal".
 - E. The remainder of the shop drawings and product data shall be submitted as a single Project Submittal, except:
 - 1. Control system shop drawings and product data may be provided as a single, separate submittal package prior to beginning of control work on site.
 - 2. Fire Sprinkler Shop Drawings and Product Data may be provided as a single, separate submittal package before or after the project submittal.
 - 3. Seismic Restraint Shop Drawings, and Product Data may be provided as a single, separate submittal package before or after the Project Submittal.
 - F. The Project Submittal must be submitted no more than three (3) weeks after the Long Lead Time Item Submittal. If the Project Submittal is found to be incomplete, it will be rejected and returned. The Project Submittal shall then be completed by the Contractor and resubmitted in its entirety.
 - G. Definitions of comments used in submittal review:

1. "No Exception Taken" The meaning and intent of this statement is that the Engineer finds no objection (except those noted thereon or in correspondence) to inclusion of items or Work indicated in construction provided that it:
 - a. Complies with Contract Drawings and Specifications as to quantities, space requirements, and dimensions.
 - b. Does not interfere with other trades.
 - c. Is not the cause of union tradesmen disputes.
 - d. Does not infringe on patent rights.
 - e. Is not the cause of injury or damage to persons or property.
 - f. Complies with OSHA regulations.
2. "Rejected" The meaning and intent of this statement is that the submitted material does not conform to plans and specifications. Resubmittal of a different product or shop drawing is required.
3. "Revise and Resubmit" This statement is used when the general product line is acceptable, but the submitted material varies in dimension, accessories, etc. from what is required. Resubmittal is required.
4. "Make Corrections Noted" This statement is used as an alternative to "Revise and Resubmit" when resubmittal is not required.
5. Said review does not relieve Contractor of any Contractual responsibilities.

1.12 TEMPORARY FACILITIES AND CONTROLS

- A. Refer to Division 1.
- B. Use of Project equipment for temporary service during construction is not allowed

1.13 SCHEDULING

- A. Schedule the Work of Divisions 20, 22 and 23 in accordance with Division 1.
- B. Schedule Work at such a time, and in such a manner, to minimize interference and inconvenience to the Owner.
- C. Work that causes disruptions of existing services shall be coordinated with the Owner. Provide a minimum of 24 hour notice prior to any shutdown of existing services.

1.14 OPERATION AND MAINTENANCE MANUALS

- A. Provide operation and maintenance manuals for the Work of this Division in accordance with Division 1 and Section 20 20 00.

1.15 VALVE AND NAMEPLATE DIRECTORIES

- A. Provide valve and nameplate directories as required herein, and in accordance with Sections 20 20 00 and 20 60 00.
- B. Framed Copies:
 1. Number Required: One.
 2. Location: As directed by Owner's representative.
 3. Type: Wood with glass cover.
- C. Service Copies:
 1. Number Required: Two.
 2. Type: Laminated plastic cover with chain loop.

1.16 MATERIAL AND EQUIPMENT

- A. Comply with Division 1.

- B. Similar products shall be of the same manufacturer.
 - C. Comply with manufacturer's printed instructions, in addition to requirements of the Contract Documents, regarding storage, handling, installation, operation, and adjustment of materials and equipment.
 - D. Protect ductwork, piping, outlets/inlets, equipment, and mechanical appurtenances from damage. Provide temporary covers as necessary to prevent accumulation of dust and debris.
 - E. Notify the Architect (or authorized representative) immediately of conflicts between manufacturer's instructions and Contract Documents. Resolve such conflicts before proceeding with the work.
- 1.17 CONTRACT CLOSEOUT
- A. Comply with Division 1.
- 1.18 FINAL CLEANING
- A. Provide cleaning for the Work of Divisions 20, 22 and 23 in accordance with Division 1.
- 1.19 RECORD DOCUMENTS
- A. Provide Record Documents for the Work of this Division in accordance with Division 1.
 - B. Record Drawings shall include:
 - 1. Contract Drawings
 - 2. Fire Suppression System Shop Drawings
 - 3. Seismic Restraint Shop Drawings
- 1.20 INSTRUCTION OF OPERATING PERSONNEL
- A. Provide instruction of Owner's operating personnel associated with the Work of Divisions 20, 22 and 23 in accordance with Division 1.
 - B. Instruct Owner's designated operating personnel in the operation and maintenance of all systems.
 - C. Submit written certificate from Owner that Instruction of Operating Personnel has been performed.
- 1.21 WARRANTIES
- A. Provide and document warranties applicable to the Work of Divisions 20, 22 and 23 in accordance with Division 1 and Section 20 20 00.
- 1.22 SELECTIVE STRUCTURE DEMOLITION
- A. Provide demolition for the Work of this Division in accordance with Division 2.
 - B. Where items are to be salvaged for relocation or retained by the Owner, removal shall cause no damage to these items. Move in accordance with manufacturer's instructions.
- 1.23 EXCAVATION AND BACKFILLING
- A. Provide trenching, excavation, and backfilling for the Work of Divisions 20, 22 and 23 in accordance with Section 31 32 33.

1.24 PAINTING

- A. Provide painting for the Work of Divisions 20, 22 and 23 in accordance with Division 9.
- B. Provide cleaning and surface preparation for products specified in Divisions 20, 22 and 23 that have finishes specified in Division 9.
- C. Paint the following items with one coat of primer and two coats of oil-based enamel:
 - 1. Uninsulated black steel pipe which is not concealed within walls or above ceilings.
 - 2. Steel supports, stands, and brackets which are not galvanized or factory painted.
 - 3. Pipe rollers, hangers, and hanger rods which are not galvanized.
 - 4. Additional items noted on Drawings or in Divisions 20, 22 and 23.
- D. Colors shall be approved by Architect.

1.25 SUSTAINABLE BUILDING REQUIREMENTS

- A. Provide work to support the project LEED® requirements for Division 20, 22 and 23 in accordance with Division 1.

Part 2 - Products (Not Used)

Part 3 - Execution (Not Used)

END OF SECTION

SECTION 20 20 00

MECHANICAL OPERATION AND MAINTENANCE MANUALS

Part 1 - General

1.01 SECTION INCLUDES

- A. General and specific requirements for Operation and Maintenance Manuals applicable to Division 20 and 23 sections. Requirements apply in addition to Division 1 requirements. Contractor shall provide Operation and Maintenance Manual for the Work of this Division.

1.02 SHOP DRAWINGS AND PRODUCT DATA

- A. Submittals required for the following, in accordance with Section 20 10 00:
 - 1. Table of Contents (TOC) for the Operation and Maintenance Manual. Provide one complete TOC with Project Submittal.

1.03 CONTRACT CLOSEOUT

- A. Submittals required for the following, in accordance with Section 20 10 00:
 - 1. Operation and Maintenance Manual. Provide 3 complete sets.

Part 2 - Products

2.01 GENERAL

- A. The requirements listed herein apply to one full set of the Operation and Maintenance Manual. Provide multiple copies of the set in accordance with requirements listed under Part 1 of this Section.
- B. Information provided in the Operation and Maintenance Manuals shall be customized for the specific equipment provided for, and as applied to, this Project.

2.02 PRESENTATION

- A. Format:
 - 1. Manufacturer's literature shall be pre-printed.
 - 2. Documents generated specifically for this project shall be machine printed on white paper, or typed.
 - 3. Hand written material is not acceptable unless specifically noted herein.
 - 4. Internally subdivide binder contents with permanent page dividers in accordance with the organizational format described herein. Tab titles shall, as a minimum, be legibly printed and inserted into reinforced laminated plastic tabs.
- B. Binding:
 - 1. In three-ring (D-side ring style) loose leaf plastic or cloth side binders. Paper report binders, or bend-tab thesis covers are not acceptable.
 - 2. 8-1/2 inch x 11 inch format.
 - 3. Ring size as necessary to contain the information for this project. Minimum ring size: 1 inch. Maximum ring size: 4 inch.
 - 4. Provide sheet lifters, front and back, in each notebook.
 - 5. Provide multiple binders where required to accommodate the data. Each binder maximum 80% full.
 - 6. Label each binder with typed, permanently adhered, labels on the front cover and the spine. Minimum Label information:

- ## 2.03 ORGANIZATION AND CONTENT OF MANUAL

- ## 2.04 DESCRIPTION OF MANUAL CONTENT

- | | |
|-----------------------------------|--|
| City of Oregon City | MECHANICAL OPERATION AND MAINTENANCE MANUALS |
| Community Development Division TI | |
| October 19, 2017 | 202000 - 2 |

- C. Directories (with Individual Directory Specific Tab):
1. "Equipment Nameplate Directory". This is a summary of the equipment included in the Project with a nameplate designation (code), such as "AHU-1", including:
 - a. Mechanical equipment type
 - b. Nameplate designation
 - c. Manufacturer's nameplate data
 - 1) Data as read from the nameplate for the actual equipment provided
 - d. Installed location
 - 1) List room name and number
 - e. Area served
 - f. Control switch normal position
 2. "Itemized Service and Maintenance Directory". Obtain information from the manufacturer. This is an itemized summary listing of service and inspection requirements. Itemize by Nameplate Designation (i.e.; AHU-1, CH-1, etc.). include:
 - a. Service and lubrication schedule:
 - 1) Filter, size, number of, performance, clean pressure drop, and recommended change-out.
 - 2) Bearing type, recommended lubricant, and frequency.
 - b. Inspection Requirements:
 - 1) Inspection type (e.g., belt wear, refrigerant charge, etc.), frequency, recommended actions.
 3. "Service and Dealer Directory". This is a summary of the equipment and material suppliers for the Project, including:
 - a. Company name for authorized service and parts
 - b. Physical address
 - c. Phone number, fax number, e-mail, and web site address (if available)
 - d. Summary listing of applicable equipment and materials
 4. "Warranties". In addition to the warranty statement, include:
 - a. Project name as shown on the Project Manual
 - b. The equipment (nameplate designation and description) and/or system to which the warranty applies
 - c. Effective date of the warranty
 - d. Expiration date of the warranty
 - e. Extent of the warranty
 - f. Company name, address, telephone number, and contact person for the issuer of the warranty
 5. "Valve Directory". This is a sequential, ascending, summary of the numbered valves in the Project, separated by system, including:
 - a. Valve number
 - b. Valve Type
 - c. Valve Size
 - d. Installed location
 - e. Valve function
 - f. Valve normal position
- D. Material and Equipment Information (under individual material or equipment specification specific tabs):
1. Shop Drawings and Product Data for items reviewed, approved, and provided for this Project
 2. Manufacturer's Printed Operation and Maintenance Manuals, including:
 - a. Manufacturer's parts list
 - b. Information for starting, adjusting, and maintaining each item in continuous operation for long periods of time
 - c. Dismantling and reassembling of the complete units and sub-assembly components with illustrations including "exploded" views showing and identifying each separate item
 - d. Identification of special tools and instrument requirements

2. Where the corresponding model number is not shown on a pre-printed sheet, hand write the model number, and associated data, in ink using legible block style lettering.

END OF SECTION

SECTION 20 42 00
SEISMIC RESTRAINTS

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 20 41 00 - Vibration Isolation

1.02 SCOPE OF WORK

- A. Provide seismic restraints in accordance with ASCE Standard 7 requirements for piping, ductwork, and mechanical equipment.
- B. Provide engineering for seismic restraint system, assemblies, and components.
- C. Provide shop drawings and installation instructions for seismic restraint system.
- D. Provide final inspection and report for installed restraint system acceptance.

1.03 DEFINITIONS AND STANDARDS

- A. Referenced Standards:
 - 1. ASCE Standard 7: American Society of Civil Engineers / Structural Engineering Institute, *Standard 7, Minimum Design Loads for Buildings and Other Structures*
- B. Design Criteria:
 - 1. Occupancy Category: ASCE 7 Occupancy Category designation, Table 1.5-1
 - 2. Site Classification: ASCE 7 Site Classification designation, Table 20.3-1
 - 3. Peak Spectral Response Acceleration (S_s): ASCE 7 Figure 22-1 - Maximum Considered Earthquake Ground Motion of 0.2s spectral response acceleration, Site Class B
 - 4. Design Spectral Response Acceleration (S_{DS}): ASCE 7, Eqs. 11.4-3 and 11.4-4
 - 5. Seismic Design Category: ASCE 7 Seismic Design Category designation, Tables 11.6-1 and 11.6-2.
 - 6. Component Importance Factor (I_P): ASCE 7, Section 13.1.3
- C. Custom Engineered Assembly: Anchorage and seismic restraint assembly, comprised of standard or proprietary components, designed and applied to system by the Seismic Engineer.
- D. Pre-Engineered Assembly: Previously designed anchorage and seismic restraint assembly selected and applied to system by the Seismic Restraint System Engineer.
- E. Seismic Restraint System Engineer: Registered Professional Engineer currently licensed in Oregon as a structural, civil, or mechanical engineer. Responsible for designing, applying, and inspecting pre-engineered seismic restraint assemblies and components in accordance with applicable codes and component manufacturer's published recommendations.
- F. Seismic Engineer: Professional engineer currently licensed in Oregon as a structural, civil, or mechanical engineer. Responsible for designing, applying, and inspecting custom seismic restraint components in accordance with applicable codes.

- G. Equipment:
1. Includes (but not limited to) pumps, fans, air handling units, heat exchangers, etc. Equipment referred to by type is typical. Equipment not specifically listed here is still subject to the requirements listed herein.
 2. Weight: Installed operating weight of equipment as reported by equipment manufacturer.
 3. Integral Isolation: Isolators which are furnished as an integral part of the equipment.
 4. Roof-Mounted: Equipment located above and attached to roof.
 5. Floor-Mounted: Equipment located on and attached to floor.
- H. Ductwork and Piping:
1. Duct Run: A length of duct without change in direction.
 2. Piping Run: A length of pipe without change in direction.
 3. Component Weight: Calculated installed (operating) weight of component.
 4. Longitudinal Bracing: Restraints applied to limit motion parallel to the centerline of the pipe or duct.
 5. Transverse Bracing: Restraints applied to limit motion perpendicular to the centerline of the pipe or duct.

1.04 PROJECT DESIGN CRITERIA

- A. Restraint system, assemblies, and components shall be designed and installed to resist lateral loads in accordance with the current adopted State of Oregon Structural Specialty Code.
- B. Seismic Design Criteria:
1. Occupancy Category: II.
 2. Site Classification: D.
 3. Peak Spectral Response Acceleration (S_s): 0.92.
 4. Design Spectral Response Acceleration (S_{DS}): 0.67.
 5. Seismic Design Category: D.
 6. Maximum Allowable Lateral Loads and Anchorage Requirements: See Structural Drawings.
 7. Component Importance Factors (I_P): 1.0.

1.05 SYSTEM ENGINEERING AND QUALITY ASSURANCE

- A. Seismic restraint system shall be engineered to comply with criteria stated and referenced herein.
- B. Seismic restraints and related engineering for HVAC, plumbing, and piping systems to be provided by a single vendor.
- C. Application of Pre-engineered Assemblies by Seismic Restraint System Engineer:
1. Application of Custom Engineered and/or Pre-Engineered Assemblies, as applicable to this project, and as follows:
 - a. Application of restraints for floor or roof-mounted equipment.
 - b. Application of restraints for curb mounted equipment including unit-to-curb and curb-to-structure attachments.
 - c. Application of seismic restraint assemblies for vibration isolated and suspended equipment.
 - d. Application of seismic restraint assemblies for piping and ductwork.
 2. Submittal packages shall bear the stamp of only the responsible Seismic Restraint System Engineer.
 3. Approved Pre-engineered Assembly and Application Services: Mason Industries, Kinetics, or an independent professional engineer meeting qualifications listed herein as Seismic Restraint System Engineer.

- D. Custom Engineered Assemblies:
 - 1. System engineering shall include design and Application of Custom Engineered Assemblies, as applicable to this project, and as follows:
 - a. Design and Application of restraints for floor or roof-mounted equipment.
 - b. Design and Application of restraints for curb mounted equipment including unit-to-curb and curb-to-structure attachments.
 - c. Design and Application of seismic restraint assemblies for vibration isolated and suspended equipment.
 - d. Design and Application of seismic restraint assemblies for piping and ductwork.
 - 2. Engineering shall be performed by, or under the direct supervision of, a Seismic Engineer meeting the qualifications listed herein. Submittal packages shall bear the signed seal of only the Seismic Engineer.
- E. For anchorage requirements and allowable lateral loads at attachment to building structural system, provide structural analysis and report from an independent Registered Structural Engineer currently licensed in the State of Oregon.

1.06 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Pre-submittal:
 - 1. Included within project Mechanical Submittals, submit attached letter outlining how the seismic requirements for this project will be met (i.e., Pre-engineered Assemblies, Custom Assemblies). In the letter state what companies will be providing the services and the qualifications of the responsible individuals.
- B. Shop drawings shall be submitted as one complete package inclusive of all mechanical systems and equipment.
- C. Submit the following in accordance with Section 20 10 00 (Reference isolated equipment as numbered in Contract Documents):
 - 1. Seismic Restraint Location Plan: Full or half size copies of ductwork and piping plans from the Contract Documents, showing locations and type of seismic restraint assemblies to be used.
 - a. Drawings shall consist of mechanically reproduced copies of the Contract Documents, or custom drafted specifically for the Work of this Project and bear only the seal of the Seismic Restraint System Engineer or Seismic Engineer. All other seals shall be eradicated from drawings prior to submittal.
 - b. Provide separate drawings for ductwork and piping systems.
 - c. Each drawing shall be printed on a single sheet. Drawings pieced together from multiple copies are not acceptable.
 - 2. Seismic Restraint Assembly Installation Details: Pre-Engineered or Custom Engineered assembly details showing required components, dimensions, and method of connection to supporting structure.
 - 3. Calculations For System Application: Calculations shall indicate maximum forces anticipated at each restraint assembly, method of determining forces, and selection of restraint assemblies.
 - a. For Pre-Engineered Assemblies, include documentation of design conditions, maximum load capacity of assembly, and maximum forces at anchorage points.
 - b. For Custom Engineered Assemblies, submit calculations identifying maximum load capacity of assembly, maximum forces on each component, sizing/selection of each component, and maximum forces at anchorage points.
- D. The entire submittal package comprised of drawings, details, and calculations for mechanical ductwork, piping, and equipment shall be stamped and signed in accordance with the requirements listed under 1.05 SYSTEM ENGINEERING AND QUALITY ASSURANCE in this specification section.

- E. At seismic restraint system installation completion, submit three (3) copies of report from seismic restraint system Engineer, or the Engineer's representative, certifying that seismic restraints are installed in conformance with approved shop drawings and no additional restraints are necessary based on field conditions. Include written authorization, from Seismic Restraint System Engineer, of the designated representative.
- F. Prior to Contract Closeout submit Operation and Maintenance information required as indicated in Section 20 20 00.

Part 2 - Products

2.01 PRE-ENGINEERED ASSEMBLIES

- A. Anchorage and seismic restraint assemblies, comprised of standard or proprietary components, capable of application to restraint system and supporting structure.
- B. Acceptable Proprietary Manufacturers: Mason Industries, Kinetics, Tolco, B-Line, or approved.

Part 3 - Execution

3.01 GENERAL

- A. Seismic restraint system shall be installed in strict accordance with the manufacturer's written instructions and certified submittal data.
- B. Conflicts with other trades that result in rigid contact with the equipment or piping due to inadequate space or other conditions shall be coordinated with the Seismic Restraint Engineer and corrected.
- C. Attach restraints and anchors to a common structural element plane and within a common structural system.
- D. For vibration isolated suspended equipment, piping, and ducts, install flexible cable restraints slightly slack to avoid vibration short circuiting.
- E. For non-isolated suspended equipment, piping, and ducts, install solid braces or taut flexible cable restraints.
- F. Provide supplementary support steel for equipment, piping, and ductwork required for the work of this Section.

3.02 EQUIPMENT SEISMIC RESTRAINT

- A. Coordinate size of housekeeping pads and/or concrete piers to ensure adequate space for required bases, isolators, restraints, and attachment thereto.

3.03 DUCTWORK AND PIPING SEISMIC RESTRAINT

- A. Provide minimum of two transverse supports and one longitudinal support on each pipe or duct run. Transverse bracing shall be installed at each turn and at each end of a run with a minimum of one brace at each end. Where a pipe or duct run is shorter than the minimum interval between braces, provide braces at each end.
- B. Where restraints are attached to clevis style pipe hangers, the cross bolt must be reinforced.

END OF SECTION

SECTION 20 42 00 - SEISMIC RESTRAINT SYSTEM ENGINEERING PRE-SUBMITTAL

PROJECT: _____

(Project Title)

The Undersigned states the following:

- Seismic restraints for the work of Divisions 22 and 23 for this project will be provided as required in Section 20 42 00.
- Application of Pre-Engineered Restraint Assemblies will be provided by Seismic Restraint System Engineer meeting qualifications of Section 20 42 00.

Seismic Restraint System Engineer:

Firm Name:

Authorized Representative:

(Name of representative authorized to act on Engineer's behalf)

- Design for Custom Engineered Restraint Assemblies will be provided by Seismic Engineer meeting qualifications of Section 20 42 00.

Seismic Engineer:

Firm Name:

Authorized Representative:

(Name of representative authorized to act on Engineer's behalf)

- Upon completion of seismic restraint system installation the Engineers listed above, or the designated representative listed, will inspect and certify that seismic restraints are installed in conformance with approved shop drawings and, based on actual field conditions, no additional restraints are necessary to comply with applicable codes.

Submitted by: _____ Signature:

Firm: _____

Address: _____

Telephone: _____ E-
mail: _____
Date: _____

SECTION 20 60 00

MECHANICAL IDENTIFICATION

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data)
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Control and Equipment Nameplates		X						

1.03 REFERENCES

- A. ANSI A13.1 (American National Standards Institute) - Scheme for the Identification of Piping Systems, latest edition.
- B. NFPA 99 (National Fire Protection Association) - Standard for Health Care Facilities, latest edition.

Part 2 - Products

2.01 CONTROL AND EQUIPMENT NAMEPLATES

- A. Nameplates:
 - 1. Type: Laminated plastic, with engraved white letters on black background.
 - 2. Letter Size: 1/2 inch tall.

Part 3 - Execution

3.01 CONTROL AND EQUIPMENT NAMEPLATES

- A. Provide nameplates for mechanical equipment -- including air handling units, fans, pumps, terminal units, reheat coils, furnaces, unit heaters, chillers, boilers, heat exchangers, storage tanks, expansion tanks, radiant piping manifolds, etc. Wording to match equipment designations on Drawings

- B. Provide nameplates for variable frequency drives. Wording to indicate equipment served, followed by the letters "VFD". For instance, label for a VFD serving an air handling unit supply fan would read: AHU-XX SF VFD
- C. Provide nameplates for control panels and major control components.
- D. Attach nameplates with rivets or screws; adhesive only fastening not permitted. Provide weather-proof sealant for outdoor applications where screws penetrate casing.
- E. At room thermostats and temperature sensors, write the name of the unit served on the inside of cover in permanent ink.

END OF SECTION

SECTION 20 91 00

TESTING, ADJUSTING AND BALANCING

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 – General Mechanical Provisions
- B. Section 20 20 00 – Mechanical Operation and Maintenance Manuals

1.02 SECTION INCLUDES

- A. Testing, adjusting, and balancing (TAB) of air systems.
- B. Measurement of final operating conditions of HVAC equipment.

1.03 QUALIFICATIONS

- A. Work of this Section shall be performed by a firm currently certified by the National Environmental Balancing Bureau (NEBB) in the following categories:
 - 1. Certification for Performance of both Air and Hydronic TAB
- B. Work of this section shall be accomplished under the on-site supervision of a NEBB Certified supervisor assigned full time to an office in the State of Oregon. The NEBB certified person designated in writing to NEBB (for the purpose of NEBB Certification of the firm) shall be the supervisor who will represent the firm. The NEBB certified supervisor shall be responsible for the supervision of on-site TAB work and the setup/review of the balancing report.
- C. Approved Firms: Northwest Engineering Service, Inc., Air Introduction and Regulation, Inc., Southern Oregon Engineering Services, Neudorfer Engineers, Inc., Air Balancing Specialty, or approved.

1.04 QUALITY ASSURANCE

- A. Work of this Section shall be done in accordance with the current edition of the *NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems*.
- B. Maintain and calibrate measuring instruments in accordance with NEBB standards.

1.05 SUBMITTALS

- A. Submittals required for the following, in accordance with Division 1 requirements, Section 20 10 00 and Section 20 20 00:
 - 1. Preliminary Balancing Report
 - a. Submittal timing: Include with "Long Lead Time Item Submittal" if provided. Otherwise, include with "Project Submittal"
 - b. Copies: Submit three (3) copies, of which one copy will be retained by Engineer.
 - c. Binding: Bind report in 3 ring binder with indexed tabs.
 - d. Content:
 - 1) Cover sheet: Provide cover sheet with each report containing:
 - a) Project name and location
 - b) Architect
 - c) Engineer
 - d) Mechanical Contractor

- e) Testing, Adjusting and Balancing Firm
 - 2) Table of Contents: Indexed to tabs.
 - 3) Proposed Forms: Copies of proposed field test log forms to be used during actual field balancing. Forms similar to and containing data indicated in example logs in *NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems*. Logs to also include (as a minimum) spaces for all data as required elsewhere in this Section. See sample forms immediately following this Section.
2. Final Balancing Report:
- a. Submittal timing: Provide Final Report prior to Contractor's application for substantial completion.
 - b. Copies: Provide 3 copies of report. Provide one copy directly to Mechanical Engineer. Insert remaining copies into Mechanical Operation and Maintenance Manuals submitted per Section 20 10 00.
 - c. Binding: Bind report in 3-ring binder with indexed tabs.
 - d. Content:
 - 1) Cover sheet: Provide cover sheet with each report containing:
 - a) Project name and location
 - b) Architect
 - c) Engineer
 - d) Mechanical Contractor
 - e) Testing, Adjusting and Balancing Firm
 - 2) Table of Contents: Indexed to tabs.
 - 3) Content:
 - a) Data required by this Section on forms approved by the Engineer.
 - b) Reduced copies of Drawings relating reference points to outlet logs, including room numbers.
 - c) Written discussion describing any discrepancies between design and actual data including description of required corrective actions necessary to meet specified flow tolerances.

Part 2 - Products

Not Used

Part 3 - Execution

3.01 GENERAL

- A. Check the following and report to Contractor for necessary corrections:
 - 1. Drafts, noise and vibration.
 - 2. Building pressure under normal operating conditions.

3.02 ADJUSTMENT AND BALANCING

- A. Mechanical Equipment:
 - 1. Provide unit designation and area served.
 - 2. Provide motor design data including HP, volts, phase, and speed (RPM).
 - 3. Provide motor nameplate data including manufacturer, frame, HP, volts, phase, FLA, RPM, service factor, and nameplate efficiency (Energy Efficient or Premium Efficiency).
 - 4. Provide motor measured data including volts and amps each phase, RPM, installed starter manufacturer and size, and installed thermal overcurrent protection size and adjustment.
 - 5. List fan design data including CFM, SP, HP, BHP, RPM.

6. Provide fan nameplate data including manufacturer, model, size, type, and serial number.
 7. List sizes and quantities of air filters.
 8. Partly blank off air filters with temporary material such as cardboard or sheet metal. Simulate partial loading of air filters by adjusting the amount area which is blanked off. For partial loading use the measured pressure drop of clean filters plus 80% of the difference between the clean pressure drop and the scheduled "change out" air pressure drop. Fill condensate trap with water and wet cooling coils. Inspect trap with fan operating and record in the Final Report whether or not the traps hold water. Filters shall remain partially blanked off while measuring fan test data.
 9. Measure and report actual fan test data including FLA, fan rpm, ESP, TSP, supply CFM, return CFM, exhaust CFM, outside air CFM, coil gpm, EAT, LAT.
 10. Measure and report pressure drops across AHU components including louvers, hoods, dampers, filters, and coils.
 11. Adjust fan speed, providing belt and sheave changes as needed to meet air outlet flow tolerances at minimum fan amperage draw.
 12. Test and balance systems and record data in specified modes of operation, including the following:
 - a. Measure and record total outside air flow. Measure by traverse, except when approved by Engineer where damper configuration prevents traverse (such as single blade OSA minimum damper), measure by temperature differential when air temperatures provide a minimum 20 deg. F air temperature delta. Provide log of traverse or description of procedure and data for measurement by temperature differential
 - b. On activation of smoke detector or receipt of building fire alarm system, verify fans shut down, operate in smoke control mode, or operate in smoke purge mode, per Section 23 09 00.
- B. System Supply, Return, Exhaust outlets:
1. Measure airflow with Shortridge Diffuser Hood or for oversized outlets measure by traverse.
 2. List method of measurement.
 3. List required design cfm, velocity, AK.
 4. List initial velocity, cfm, and percent of design flow at each inlet and outlet.
 5. Coordinate with controls installer in Section 23 09 00 to command variable air volume (VAV) devices fully open. Where fan total is less than terminal unit totals due to load diversity (verify), open VAV devices in groups of zones per NEBB procedures.
 6. Measure supply outlet flows at minimum and 100% outside air.
 7. Measure supply outlets served by variable volume terminal units at minimum and maximum flows.
 8. Proportion flow between outlets. Report outlet and inlet flows as actual CFM and as percent of required. Adjust and list, or re-adjust fan speed, until volumes are within specified flow tolerances.
 9. Adjust diffuser patterns to minimize drafts.
 10. Mark final positions of balancing dampers.
- C. Duct-Mounted Electric Heating Coils:
1. Indicate actual and measured kW, BTU, steps, and CFM.
- D. System flow tolerances at maximum flow:
1. Air handling unit, supply air flow less than 5,000 cfm: -10 percent to +10 percent.
 2. Air handling unit, outside air flow: -0 percent to +10 percent at minimum setting.
 3. All other fans, air flow: -0 percent to +10 percent.
 4. Individual room air outlets and inlets, and air flow rates not mentioned above: -10 percent to +10 percent.

- E. Room Thermostats:
 - 1. Check and report thermostat settings and room temperature after all adjustments have been made, with HVAC system(s) operating under automatic control.
- F. Repair:
 - 1. Provide plastic plugs to seal holes drilled in ductwork for test purposes.
 - 2. Repair or replace insulation removed or damaged for TAB work. Refer to requirements for insulation in Sections 22 14 10, 22 41 20, and 23 07 00.
- G. Final Adjustments and Fine Tuning:
 - 1. For a period of one year after final acceptance, provide call back site visits as requested by the Engineer at no additional cost to the project.

END OF SECTION

AIR INLET AND OUTLET TEST LOG

Company Name: _____

Technician: _____

Test Apparatus: _____

NEBB Certified Supervisor:: _____

SUPPLY AIR OUTLETS	
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NOTES:

SECTION 22 11 00

PIPING

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 22 53 00 - Refrigerant Piping and Specialties

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data)
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Piping Materials and Fittings		X						
Piping Specialties		X						
Pipe Supports		X						

1.03 QUALITY ASSURANCE

- A. Qualification of Brazers:
 - 1. Submit documentation of installers and brazers qualifications prior to commencing work.

1.04 DEFINITIONS

- A. Indoors: Inside building insulation envelope.
- B. Outdoors or Wet Areas: Outside building insulation envelope.
- C. Accessible Locations: Installed where exposed or installed above accessible ceiling systems.
- D. Inaccessible Locations: Installed in concealed spaces such as walls, shafts, chases, or above inaccessible ceilings.

Part 2 - Products

2.01 PLUMBING PIPING

- A. Cooling Coil Condensate Drain (CD) within building:
 - 1. Pipe: Type M copper, hard drawn, ASTM B-88.
 - 2. Fittings: Wrought copper, ANSI B-16.22.
 - 3. Joints: Lead-free 95-5 tin-antimony solder, or approved.
- B. Cooling Coil Condensate Drain (CD) outside building:
 - 1. Option #1:
 - a. Pipe: Schedule 40 PVC, ASTM D-1785, Type 1.
 - b. Fittings: Schedule 40 PVC, ASTM D-2466.
 - c. Joints: Solvent cemented, in accordance with ASTM D-2855, using ASTM D-2564 solvent cement and ASTM F-656 primer.
 - d. Paint: One coat outdoor latex.
 - 2. Option #2:
 - a. Pipe: Type M copper, hard drawn, ASTM B-88.
 - b. Fittings: Wrought copper, ANSI B-16.22.
 - c. Joints: Lead-free 95-5 tin-antimony solder, or approved.

2.02 REFRIGERANT PIPING

- A. Refrigerant (RS, RL):
 - 1. Pipe: Type ACR copper, hard drawn, ASTM B280, factory dehydrated, degreased, and plugged at each end to maintain cleanliness during storage, marked "ACR" in blue.
 - 2. Fittings: Wrought copper, ANSI B-16.22.
 - 3. Joints: Silver/copper-alloy brazed.

2.03 PIPE SUPPORTS

- A. Ring Hangers for Pipe Sizes 3 inch and smaller:
 - 1. Type: Carbon steel band, adjustable, with knurled swivel nut.
 - 2. Finish:
 - a. Indoors: Zinc plated.
 - b. Outdoors or Wet Areas: Hot dip galvanized.
 - 3. Approvals: UL and FM.
 - 4. For uninsulated copper piping: Equivalent to model specified, with addition of copper plating, neoprene coating, or PVC coating.
 - 5. Manufacturer:
 - a. Anvil Fig. 70
 - b. B-Line Fig. B 3170
 - c. Super Strut C-727
 - d. PHD Model 151
 - e. Erico/Michigan Model 100
- B. Hanger Rods:
 - 1. Material: Carbon steel.
 - 2. Finish:
 - a. Indoors: Zinc plated.
 - b. Outdoors or Wet Areas: Hot dip galvanized.

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.

- B. Install piping plumb and parallel true to building structural system.
 - C. Install branch piping to allow for expansion with offsets and swing joints as necessary to prevent undue strain.
 - D. Do not use bushings and close nipples.
 - E. Do not penetrate structural members.
 - F. Screwed joints shall have less than two percent of threads showing.
 - G. Ream pipes to full inside diameter prior to making up joints.
 - H. Comply with applicable IAPMO Installation Standard for each particular piping material.
 - I. Make branches and elbows with fittings specified herein. "Pulled tees", saddle taps, and field fabricated fittings are not acceptable.
 - J. **Brazed Pipe Joints:**
 - 1. Brazing procedures shall be in accordance with Copper Tube Handbook of the Copper Development Association.
 - 2. Clean flux from joints.
 - 3. Purge oxidized carbon from pipes prior to cleaning or disinfection.
 - K. **Testing of Piping Systems:**
 - 1. Advise Architect or authorized representative when testing will be performed.
 - 2. Test before concealing pipe joints and welds.
 - 3. Before testing, isolate all equipment or components which are not rated for test pressures.
 - 4. Record temperature at start and finish of test. Pressure readings at finish of test shall be adjusted to account for temperature change of medium during the test.
 - 5. Test pressures shall be as specified herein for each type of piping system.
 - 6. Comply with testing requirements of authorities having jurisdiction, in addition to requirements specified herein.
 - 7. Piping systems shall hold test pressure for a minimum of one hour with no leakage.
- 3.02 PLUMBING PIPING
- A. **Drain and Waste Piping:**
 - 1. Slope 1/4 inch per foot, minimum, unless otherwise noted on Drawings.
 - 2. Test Pressure: Fill system with water to highest point.
 - 3. At pipes crossing building seismic joints, install four 6-inch long sections of pipe with no-hub couplings.
- 3.03 REFRIGERANT PIPING
- A. Slope suction lines toward compressor 1 inch per 10 feet. Provide traps at vertical rises against flow in suction lines.
 - B. Circulate dry nitrogen through pipe during brazing operation to eliminate formation of copper oxide.
 - C. Pressure test with dry nitrogen at 300 psig for 12 hours.
 - D. Evacuate piping system to achieve 27 inches Hg. vacuum, then break vacuum with dry nitrogen.
 - E. Repeat evacuation process for a total of three purges, then charge with refrigerant after the last purge.

- F. Comply with ASHRAE 15 for refrigerant charging procedures.

3.04 PIPING SPECIALTIES

- A. Escutcheons:
1. Install on exposed pipe through walls, floors, or ceilings.
 2. Secure escutcheon to pipe and wall with caulk.
 3. Escutcheons not required in mechanical rooms.

3.05 PIPE SUPPORTS

- A. General:
1. Refer to Section 22 14 10 to determine pipe insulation requirements.
 2. Supports for the following shall bear directly on the pipe:
 - a. Uninsulated pipe.
 - b. 1 inch and smaller domestic hot water and heating water pipe.
 3. Size hangers to fit outside of pipe insulation, except where hangers shall bear directly on the pipe.
 4. Provide pipe support shoe welded to pipe at each roller hanger.
 5. Comply with applicable IAPMO Installation Standard for particular piping material.
- B. Copper Pipe, Horizontal:
1. Support within 2 feet of each direction change.
 2. Maximum spacing of supports:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
1-1/2 inch and smaller	3/8 inch	6 feet 0 inches
2 inch and larger	3/8 inch	10 feet 0 inches

- C. Insulated Pipe Shields for Use at Pipe Supports:
1. Type: Preformed pipe insulation with an insulation shield.
 2. Insulation (Pipe sizes 1-1/4 inch through 3 inch):
 - a. Type: Rigid, polyisocyanurate foam, preformed to fit pipe size.
 - b. Conductivity ("k"): Not to exceed 0.19 at 75 degrees F mean temperature.
 - c. Thickness: To match adjacent pipe insulation. See Section 22 14 10.
 - d. Length: To match insulation shield.
 - e. Manufacturer: Dow "Trymer 2000".
 3. Insulation Jacket:
 - a. Type: .016 inch thick aluminum, preformed to fit pipe.
 - b. Finish: Stucco embossed pattern.
 - c. Moisture Barrier: Kraft or polyethylene.
 4. Insulation Shield:
 - a. Type: Galvanized steel, 2 overlapping pieces, full 360 degree.
 - b. Minimum Thickness:
 - 1) Pipe Sizes 1-1/4 to 2 inch: 24 gauge
 - c. Minimum Length: 12 inch.
 5. Manufacturer: E.J. Bartells, ISSI Product Inc., Pipe Shields Inc., Erico/Michigan, or field fabricated with components specified herein.

3.06 SLEEVES AND SEALS

- A. Install sleeves and seals at pipe penetrations through walls and floors. Insulation shall be continuous through penetrations. Coordinate with pipe insulation requirements in Section 22 14 10.
- B. Caulk between pipe and sleeve at penetrations of walls and floors which are not fire-rated.

END OF SECTION

SECTION 22 14 10

PIPING INSULATION

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 22 11 00 - Piping: Pipe Supports, Insulated Pipe Shields

1.02 QUALITY ASSURANCE

- A. Products shall have flame spread and smoke developed ratings based on test procedures in accordance with NFPA-255 and UL-723. Ratings shall be indicated on the product or on the shipping cartons.
- B. Unless otherwise specified herein, products shall have flame spread ratings not to exceed 25 and smoke developed ratings not to exceed 50.
- C. Products shall comply with the requirements of Oregon Revised Statute (ORS) 453.005 (7) (e), effective January 1, 2011. The referenced statute limits the use of three types of brominated fire retardant chemicals, which are defined as hazardous substances.

1.03 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information required for the products listed in the Product Table, indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data), including documentation of ORS 453.005 (7) (e) compliance.
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Pipe Insulation		X						
Jackets and Fitting Covers		X						
Accessories		X						

Part 2 - Products

2.01 GENERAL REQUIREMENTS FOR INSULATION MATERIALS

- A. Products shall not contain formaldehyde, asbestos, lead, mercury or mercury compounds and shall be UL GREENGUARD Gold or Indoor Advantage Gold where available.
- B. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

2.02 PIPE INSULATION

- A. Elastomeric Foam (EF):
 - 1. Type: Flexible, closed cell elastomeric foam, unslit tubing.
 - 2. Joining System: Field applied contact cement.
 - 3. Conductivity ("k"): Not to exceed 0.28 at 75 degrees F mean temperature.
 - 4. Temperature Rating: 220 degrees F for continuous use.
 - 5. Manufacturer: Armacell LLC "AP/Armaflex," with Armacell LLC "WB Armaflex Finish" weather resistant coating where required in Part 3.

2.03 JACKETS AND FITTING COVERS

- A. Aluminum Jacket and Fitting Covers (AL):
 - 1. Type: .016 inch thick aluminum, preformed to fit pipe and fittings.
 - 2. Finish: Stucco embossed pattern.
 - 3. Shapes: Elbows, tees, valves, reducers, flanges, and end caps; in various sizes.
 - 4. Moisture Barrier: Kraft or polyethylene.

2.04 ACCESSORIES

- A. Insulating Cement: Comply with ANSI/ASTM C195.
- B. Finishing Cement: Comply with ASTM C449.
- C. Mastic, Coatings, Tapes, and Adhesives: Comply with Manufacturer's installation instructions for each type of insulation.

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with Manufacturer's instructions.
- B. Install products in accordance with MICA (Midwest Insulation Contractors Association) - National Commercial & Industrial Insulation Standards.
- C. Insulate new pipe, fittings, valves, and specialties for each piping system included under APPLICATION TO PIPING SYSTEMS.
- D. Verify piping has been tested and approved before installing insulation.
- E. Clean and dry piping before installing insulation.
- F. On exposed piping, locate insulation seams in least visible location.
- G. Insulation shall be continuous through walls, floors, ceilings, sleeves, and other penetrations. Where penetrations through non-structural framing members would require openings larger than allowed by the Oregon Structural Specialty Code or Oregon Mechanical Specialty Code (Section 302), fill maximum allowable size annulus with

polyurethane expanding foam sealer. Trim foam sealer flush with framing member, butt insulation tight to foam, and seal vapor barrier to framing member.

3.02 INSULATION AT PIPE SUPPORTS

- A. Refer to Section 22 11 00 for insulated pipe shields at pipe supports. At insulated pipe shields, lap insulation vapor barrier over cover of pipe shield and seal with factory approved vapor barrier tape. Seal longitudinal seams of pipe shield cover with vapor barrier tape or mastic. For piping where PVC or aluminum jacket is required, jacket shall be continuous over insulated pipe shields.

3.03 CLOSED CELL ELASTOMERIC FOAM PIPE INSULATION (EF)

- A. Slip tubular insulation over pipe before making joints.
- B. Do not slit insulation lengthwise.
- C. Seal butt joints under light compression with contact adhesive approved by insulation manufacturer.
- D. Insulate fittings with oversize pipe insulation or miter-cut pieces of pipe insulation joined with contact adhesive to provide a continuous positive vapor barrier.
- E. On outdoor installations and installations where painting is required by Section 20 10 00 provide two coats of insulation manufacturer's weather-resistant finish.

3.04 JACKETS AND FITTING COVERS

- A. General:
 - 1. Provide Fitting covers as follows:
 - Insulated piping located outside building above ground.
 - 2. Provide Jackets as follows:
 - a. Insulated piping located outside building above ground.
 - 3. Where jackets and fitting covers are required, use the following types:
 - a. Outdoors above ground: AL.
 - b. Fitting covers shall be same material as jackets, except at Contractor's option Type EF insulation may be used as fitting covers on type FG insulation at flanged connections and grooved couplings.
- B. Installation:
 - 1. General:
 - a. Overlap seams 2 inches minimum and as indicated herein.
 - b. Seal per manufacturer's recommendations.
 - 2. Aluminum Jackets and Fitting Covers (AL):
 - a. Install aluminum fitting covers with overlap facing down.
 - b. Lap jackets over fitting covers with longitudinal seams of jackets on lower third of piping, and end of overlap facing downward.
 - c. Secure jackets with aluminum bands or #8 x 1/2 inch galvanized sheet metal screws 6 inches maximum on center.
 - d. At breaks in insulation, cover exposed ends with aluminum endcaps.
 - e. Seal seams and joints with silicone sealer, to provide a continuous waterproof jacket.

3.05 APPLICATION TO PIPING SYSTEMS

- A. General Application To Piping Systems:
 - 1. Piping above ground located inside building, on roof, on grade or outside building.
 - 2. Insulation of valves and miscellaneous piping accessories: See Part 3 Execution hereinbefore.

3. Minimum Insulation Thickness Compliance: 2014 Oregon Energy Efficiency Specialty Code (OEESC) Table 503.2.8 as a minimum.
- B. Refrigerant Suction (RS), Refrigerant-Liquid (RL), [Refrigerant Hot Gas (RHG)]
1. Fluid Operating Temperature Range: Varies
 2. Inside Building:
 - a. Type: EF.
 - 1) All pipe sizes: 1 inch.
 3. Outside Building:
 - a. Type: EF
 - 1) All pipe sizes: 1 inch.
 - b. Jacketing: AL
- C. Piping in Return Air Plenums:
1. Piping located in return air plenums where piping material does not have flame spread and smoke developed ratings meeting ASTM E 84, including plastic piping, provide pipe wrap for the following systems:
 - a. Sanitary waste and vent piping
 - b. Potable water piping
 - c. Non-potable water piping
 - d. PEX piping
 - e. PVC chilled water piping.
 2. Type: CF.
 - a. All pipe sizes: One half inch.
- 3.06 MISCELLANEOUS PIPING INSULATION - SCHEDULE B
- A. General Application To Piping Systems:
1. PEX tubing
 2. Piping imbedded in concrete or in CMU walls
 3. Piping subject to damage
 4. Direct buried piping
 5. Direct buried heating and hot water system piping may be reduced by 1-1/2 inches (before any thickness adjustment allowed by OEESC Table 503.2.8) but not to a thickness less than 1 inch.
- B. Domestic Cold Water (CW), [Non-Potable Cold Water (NCW)], [Industrial Cold Water (ICW)]:
1. Fluid Operating Temperature Range: 40 to 60 deg F
 2. PEX tubing, above ground:
 - a. Type: EF.
 - 1) Pipe sizes less than 1-1/2 inches: 1/2 inch
 - 2) Pipe sizes 1-1/2 inches and larger: 1 inch
 3. Embedded in concrete:
 - a. Type: EF or PF .
 - 1) All pipe sizes: 1/2 inch.
 4. In CMU walls:
 - a. Type: EF or PF.
 - 1) All pipe sizes: 1 inch.
- C. Domestic Hot Water (HW, HWR, T), [Non-Potable Hot Water (NHW, NHR, NT)], [Industrial Hot Water (IHW, IHWR)]:
1. Fluid Operating Temperature Range: 105 to 140 deg F.
 2. PEX tubing, above ground:
 - a. Type: EF
 - 1) Pipe sizes less than 1-1/2 inches: 1 inch
 - 2) Pipe sizes 1-1/2" inches and larger: 1-1/2 inches

3. Embedded in concrete:
 - a. Type: EF or PF
 - 1) All pipe sizes: 1/2 inch.
 4. In CMU walls:
 - a. Type: EF or PF
 - 1) All pipe sizes: 1-1/2 inches
 5. Direct buried:
 - a. Type: EF or PF
 - 1) All pipe sizes: 1-1/2 inches.
- D. Chilled Water (CHS, CHR):
1. Fluid Operating Temperature Range: 40 to 60 deg F.
 2. PEX tubing, above ground:
 - a. Pipe sizes less than 1-1/2 inches: 1 inch (Based on ASHRAE 189.1 2009)
 - b. Pipe sizes 1-1/2 inches and larger: 1-1/2 inch (Based on 2009 ASHRAE 189.1 2009)
 3. Embedded in concrete:
 - a. Type: EF or PF.
 - 1) All pipe sizes: 1 inch.
 4. In CMU walls:
 - a. Type: EF or PF.
 - 1) All pipe sizes: 1-1/2 inches.
 5. Subject to Damage
 - a. Type: CS.
 - 1) All pipe sizes: _____ inches.
 6. Direct buried:
 - a. Type: CG.
 - 1) All pipe sizes: 2 Inches.
- E. Heating Water (HS, HR):
1. Fluid Operating Temperature Range: 105 to 140 deg F..
 2. PEX tubing, except where embedded in concrete:
 - a. Type: EF or PF.
 - 1)
 3. Embedded in concrete:
 - a. Type: EF or PF.
 - 1) All pipe sizes: 1 inch.
 4. In CMU walls:
 - a. Type: EF or PF.
 - 1) All pipe sizes: 1-1/2 inches.
 5. Subject to Damage
 - a. Type: CS.
 - 1) All pipe sizes: _____ inches.
 6. Direct buried:
 - a. Type: CG.
 - 1) All pipe sizes: 2 inches.
- F. Low Pressure Steam (LPS):
1. Fluid Operating Temperature Range (15 psig max. steam pressure): 201 to 250 deg F.
 2. Subject to Damage
 - a. Type: CS.
 - 1) Pipe sizes ____ through ____ inches: ____ inches.
 - 2) Pipe sizes ____ through ____ inches: ____ inches.

- G. Medium Pressure (MPS):
1. Fluid Operating Temperature Range (75 psig max. steam pressure): 251 to 350 deg F.
 2. Subject to Damage
 - a. Type: CS.
 - 1) Pipe sizes ____ through ____ inches: ____ inches.
 - 2) Pipe sizes ____ through ____ inches: ____ inches.
- H. High Pressure Steam (HPS):
1. Fluid Operating Temperature Range (120 psig maximum steam pressure): 251 to 350 deg
 2. Subject to Damage
 - a. Type: CS.
 - 1) Pipe sizes ____ through ____ inches: ____ inches.
 - 2) Pipe sizes ____ through ____ inches: ____ inches.
- I. Low Pressure Steam Condensate And Pumped Condensate (LPC, PC):
1. Fluid Operating Temperature Range: 201 to 250 deg F
 2. Embedded in concrete:
 - a. Type: FG.
 - b. All pipe sizes: 1-1/2 inches.
 3. Subject to Damage
 - a. Type: CS.
 - 1) Pipe sizes ____ through ____ inches: ____ inches.
 - 2) Pipe sizes ____ through ____ inches: ____ inches.
- J. Medium and High Pressure Steam Condensate (MPC, HPC):
1. Fluid Operating Temperature Range: 251 to 350 deg F
 2. Embedded in concrete:
 - a. Type: FG.
 - b. All pipe sizes: 1-1/2 inches.
 3. Subject to Damage
 - a. Type: CS.
 - 1) Pipe sizes ____ through ____ inches: ____ inches.
 - 2) Pipe sizes ____ through ____ inches: ____ inches.

END OF SECTION

SECTION 23 07 00

DUCTWORK INSULATION

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals

1.02 QUALITY ASSURANCE

- A. Products shall have flame spread and smoke developed ratings based on test procedures in accordance with NFPA-255 and UL-723. Ratings shall be indicated on the product or on the shipping cartons.
- B. Unless otherwise specified herein, products shall have flame spread ratings not to exceed 25 and smoke developed ratings not to exceed 50.
- C. Products shall comply with the requirements of Oregon Revised Statute (ORS) 453.005 (7) (e), effective January 1, 2011. The referenced statute limits the use of three types of brominated fire retardant chemicals, which are defined as hazardous substances.

1.03 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data), including documentation of ORS 453.005 (7) (e) compliance.
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Duct Insulation		X				X		
Accessories		X						

Part 2 - Products

2.01 DUCT INSULATION

- A. Fiberglass Duct Wrap:
 - 1. Type: Flexible wrap with factory applied vapor barrier facing.

2. R-Values (hr.ft².deg F/Btu) with "Installed" / "Out-Of-Package" rating based on material thickness compressed to a maximum of 25%:
 - a. One and one half inch thickness: R-value = 4.2 / 5.2 minimum
 - b. Two inch thickness: R-value = 5.6 / 6.9 minimum
 - c. Three inch thickness: R-Value = 8.3 / 10.3 minimum
 3. Thermal Conductivity("k"): 0.29 at 75 degrees F mean temperature labeled thickness.
 4. Facing: Laminated aluminum foil, glass scrim, and kraft paper vapor barrier; with 2 inch sealing flap.
 5. Facing Permeability: Not to exceed 0.04 perms.
 6. Manufacturer and Model: Johns Manville, Certain Teed, Knauf, Owens Corning, or approved. Similar to Johns Manville Microlite XG Type 75.
- B. Fiberglass Duct Liner:
1. Type: Flexible fiberglass liner in roll form with black mat coating exposed to airstream.
 2. Noise Reduction Coefficient: Not less than 0.7, in accordance with ASTM C-423-81a.
 3. R-Values (hr.ft².deg F/Btu) rating based on material thickness at 75 degrees F mean temperature:
 - a. One inch thickness: R-value = 4.2 minimum
 - b. One and one half inch thickness: R-value = 6.3 minimum
 - c. Two inch thickness: R-value = 8.0 minimum
 4. Thermal Conductivity("k"): 0.24 at 75 degrees F mean temperature for 1" thickness.
 5. Maximum Service Velocity: Not less than 4,000 feet per minute.
 6. Manufacturer: CertainTeed, Knauf, Owens Corning, Johns Manville, or approved. Equivalent to Johns Manville Linacoustic RC.

2.02 ACCESSORIES

- A. Mastic, Coatings, Tapes, and Adhesives: Comply with manufacturer's installation instructions for each type of insulation.
- B. Weld Pins:
1. Type: Retainer disk attached to pin, for resistance welding to duct surface after liner is in place.
 2. Retainer Disk: Not less than 0.75 square inches.
 3. Pin: 0.1 inch shorter than liner thickness. Pins shall not protrude into airstream.
 4. Manufacturer: Similar to Duro-Dyne "CP Series Clip-Pins."
- C. Stick Pins:
1. Type: Perforated base with protruding pin, for gluing to duct surface prior to application of liner.
 2. Pin: 0.25 inches longer than liner thickness.
 3. Self-locking Washer: Attaches to pin after application of liner.
 4. Manufacturer: Similar to Gemco series PH.

Part 3 - Execution

3.01 GENERAL

- A. Prior to installation of insulation, verify that:
1. Ductwork has been tested and approved.
 2. Duct seams have been sealed.
 3. Duct surfaces are clean and dry.

- B. Do not insulate the following:
 - 1. Pre-insulated underground ducts.
 - 2. Duct access doors. Tape insulation to duct around duct access door
 - C. Install products in accordance with manufacturer's recommendations.
 - D. Install products in accordance with MICA (Midwest Insulation Contractors Association) - National Commercial & Industrial Insulation Standards.
- 3.02 FIBERGLASS DUCT WRAP WITH VAPOR BARRIER
- A. Fully wrap duct, with facing to the outside.
 - B. Overlap vapor barrier facing 2 inches minimum at seams and joints.
 - C. Seal all seams, joints, and penetrations with foil-faced pressure sensitive tape of same material as insulation facing, to provide a continuous vapor barrier.
 - D. On ducts 24 inches or more in width, secure insulation on underside of ducts with stick pins 18 inches maximum on center, 6 inches minimum from edges of duct. Cut pins off flush with washer and seal with vapor barrier tape.
- 3.03 DUCT LINER
- A. Apply 90 percent coverage of approved adhesive to inside of duct per NAIMA and SMACNA guidelines.
 - B. Cover interior of duct with liner, with mat coating of liner toward the airstream.
 - C. Seams and joints shall be neatly butted, with edges coated with adhesive.
 - D. Coat leading edges with adhesive or provide liner with factory-applied edge coating. For duct velocities above 2000 fpm, provide metal nosing around leading edges.
 - E. Install weld pins, spaced according to liner manufacturer's instructions, not greater than 18 inches on center or greater than 3 inches from any edge.
 - F. Weld pins shall be resistance welded to duct with a machine similar to Duro-Dyne "Pinspotter."
- 3.04 APPLICATION TO DUCT SYSTEMS
- A. Definitions:
 - 1. Duct Liner: Ducts and plenums shown on drawings to be provided with duct liner. External duct wrap is not required when liner is used unless specifically shown or specified.
 - 2. Outside Air Ducts: Ducts conveying untempered outside air.
 - 3. Tempered Air Ducts: Ducts conveying air within 15 degrees F of space setpoint temperature.
 - 4. Conditioned space: An area or room within a building heated and cooled to normal comfort level or with a fixed opening directly into an adjacent conditioned space.
 - B. Ducts Located Outside Building Insulation Envelope:
 - 1. Applications:
 - a. Supply and return ducts or plenums exposed to outdoor temperatures
 - b. Supply and return ducts or plenums located in a vented attic
 - c. Supply and return ducts or plenums located inside a vented crawl space

- d. Supply and return ducts or plenums located in a shaft with wall/s exposed to the exterior
 - e. Exhaust ducts or plenums shown with duct liner on the drawings used to prevent internal surface condensation
 - f. Supply ducts from heat recovery devices exposed to outdoor temperatures
 - g. Exhaust ducts to heat recovery devices exposed to outdoor temperatures
 - 2. Fiberglass Duct Wrap:
 - a. Supply and Return Ducts or Plenums Not Exposed To Rain Or Snow
 - 1) R-Value: R-8 minimum (Installed)
 - 2) Insulation Thickness: 3 inches
 - b. Exhaust Ducts or Plenums Not Exposed To Rain Or Snow (Condensation Control) :
 - 1) R-Value: R-4.2 minimum (Installed)
 - 2) Insulation Thickness: 1-1/2 inches
 - 3. Fiberglass Duct Liner :
 - a. Supply and Return Ducts or Plenums:
 - 1) R-Value: R-8 minimum
 - 2) Insulation Thickness: 2 inches
 - b. Exhaust Ducts or Plenums (Condensation Control) :
 - 1) R-Value: R-4.2 minimum (Installed)
 - 2) Insulation Thickness: 1 inch
- C. Ducts or Plenums Located Inside Building Insulation Envelope:
- 1. Applications:
 - a. Supply ducts or plenums in unvented attic with roof insulation above
 - b. Supply ducts or plenums in "indirectly conditioned" ceiling space i.e. separated from the conditioned space by a ceiling with conditioned space on floor above
 - c. Supply ducts or plenums located in a plenum, shaft or mechanical room used to convey return or exhaust air
 - d. Supply ducts or plenums located inside unconditioned shaft
 - e. Return ducts or plenums shown with duct liner on the drawings used for acoustic attenuation
 - f. Exhaust ducts or plenums shown with liner on the drawings used for acoustic attenuation
 - g. Supply ducts from heat recovery devices
 - h. Exhaust ducts to heat recovery devices
 - 2. Fiberglass Duct Wrap:
 - a. Supply Air Ducts or Plenums:
 - 1) R-Value: R-5 minimum (Installed)
 - 2) Insulation Thickness: 2 inches
 - 3. Fiberglass Duct Liner:
 - a. Supply Ducts or Plenums:
 - 1) R-Value: R-5 minimum
 - Insulation Thickness: 1-1/2 inches
 - b. Return Ducts or Plenums (For Sound Attenuation):
 - 1) R-Value: R-4.2 minimum
 - 2) Insulation Thickness: 1 inch
- D. Ducts or Plenums In "Tempered" Unconditioned Spaces Inside Building Insulation Envelope
- 1. Applications:
 - a. Supply and return ducts or plenums in spaces with temperature controlled to 55 deg F minimum and 85 deg F maximum. Examples: Mechanical Rooms, Electrical Rooms, Storage Spaces and Equipment Rooms.
 - 2. Fiberglass Duct Wrap:
 - a. Supply and Return Air Ducts or Plenums:
 - 1) R-Value: R-5 minimum (Installed)

- 2) Insulation Thickness: 2 inches
- 3. Fiberglass Duct Liner :
 - a. Supply and Return Air Ducts or Plenums:
 - 1) R-Value: R-5 minimum
 - 2) Insulation Thickness: 1-1/2 inches
- E. Outside Air Intake Ducts or Plenums Inside Building Insulation Envelope:
 - 1. Applications:
 - a. For condensation control on external surfaces
 - b. Ventilation ducts or plenums conveying untempered outside air within building insulation envelope
 - c. Outside air intake plenums (Built-Up):
 - 1) Option 1: Plenum liner on top and side walls, external duct board insulation on bottom of plenum.
 - 2) Option 2: Internal elastomeric foam insulation. Internal liner installation shall provide a watertight floor to allow drainage of potential water carry-over through louvers or screens and be cleanable.
 - 3) Insulation not required on slab-on-grade floors serving as bottom of plenums.
 - 2. Fiberglass Duct Wrap:
 - a. Outside Air Ducts Or Plenums:
 - 1) R-Value: R-4.2 minimum (Installed)
 - 2) Insulation Thickness: 1-1/2 inches

END OF SECTION

SECTION 23 31 00

DUCTWORK

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 23 07 00 - Ductwork Insulation
- D. Section 23 33 00 - Ductwork Accessories

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data)
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Round, Rectangular and/or Exposed	X	X				X		
Flexible Duct		X						
Duct Sealants		X						

Part 2 - Products

2.01 DUCTWORK

- A. Fabrication and Site Delivery:
 - 1. Factory / Shop sealed by blanking or capping duct ends, bagging of small fittings, surface wrapping or shrink wrapping.
- B. Rectangular Ducts:
 - 1. Material: Galvanized steel, except as follows:
 - a. Provide aluminum (alloy 3003-H-14), where indicated on Drawings and for exhaust ducts serving rooms with showers or bath tubs.
 - b. Provide stainless steel (type 304) where indicated on Drawings.
 - 2. Fabricate and support in accordance with:
 - a. Oregon Mechanical Specialty Code, current edition.
 - b. SMACNA HVAC Duct Construction Standards, current edition.

3. Pressure Classification:
 - a. Supply Ducts: 2 inch w.g. positive static pressure, except where noted otherwise on Drawings.
 - b. Return, Exhaust, and Outside Air Ducts: 2 inch w.g. negative static pressure, except where noted otherwise on Drawings.
 4. Transverse Joints: In accordance with details in SMACNA HVAC Duct Construction Standards or one of the following proprietary joint systems:
 - a. Ductmate "25" with butyl gasket tape.
 - b. Ductmate "35" with butyl gasket tape.
 - c. Lockformer "TDC" with butyl gasket tape.
 - d. Ward Duct Connectors Inc. "WDCI Lite" with butyl gasket tape.
 - e. Ward Duct Connectors Inc. "WDCI Heavy" with butyl gasket tape.
 - f. Spinfinity "AccuFlange."
 5. Transverse Joints, Outdoors: SMACNA "T-20" or "T-24" flanged joint or approved proprietary joint system. Outdoor joints shall have continuous cleats for complete coverage of flanges on top and sides of duct. Top cleat shall overhang corners approximately 1/4 inch.
 6. Crossbreaking or Rollbeading:
 - a. Duct panels 16 inches wide and larger shall be rollbeaded or crossbroken, regardless of whether or not duct is lined or insulated.
 - b. Rollbeads shall be 1/8 inch deep, shall be parallel to transverse joints on tops of outdoor ducts, and shall be spaced maximum 12 inches on centers.
 - c. Ducts installed outdoors shall be crossbroken on top panels, to drain water.
 7. Material Thickness:
 - a. Duct gauges shall be determined using tables in SMACNA HVAC Duct Construction Standards, based on duct size, material, pressure class, joint type, and reinforcement spacing.
 - b. "Addendums to SMACNA" and other publications by proprietary joint manufacturers shall not be used for determining material thickness.
 - c. For determining duct gauges using SMACNA tables, proprietary joint systems shall be considered equivalent to the following SMACNA rigidity classes:
 - 1) Lockformer "TDC," 24 gauge: Class "D."
 - 2) Lockformer "TDC," 22 gauge: Class "E."
 - 3) Lockformer "TDC," 20 gauge: Class "F."
 - 4) Lockformer "TDC," 18 gauge, with tie rod(s) on each side of joint: Class "K."
 - 5) Ductmate "25": Class "F."
 - 6) Ductmate "35": Class "J."
 - 7) Ward "WDCI Lite": Class "F."
 - 8) Ward "WDCI Heavy": Class "J."
 - d. Ducts with proprietary joints shall be 24 gauge minimum.
 - e. Equivalent aluminum duct gauges shall be determined in accordance with SMACNA HVAC Duct Construction Standards.
 8. Sealing Requirements: Seal transverse joints and longitudinal seams with tape-and-adhesive or liquid duct sealer, specified herein. Not required for gasketed, flanged joints.
 9. Fittings: Refer to details on Drawings.
- C. Round Ducts, Indoors, Except Medium Pressure and Exposed:
1. Material: Galvanized steel, except as follows:
 - a. Provide aluminum (alloy 3003-H-14) where noted on Drawings, and for exhaust ducts serving rooms with showers or bathtubs.
 - b. Provide stainless steel (type 304) where noted on Drawings.
 2. Fabricate and support in accordance with latest editions of:
 - a. Oregon Mechanical Specialty Code
 - b. SMACNA HVAC Duct Construction Standards

3. Pressure Classification:
 - a. Supply Ducts: 2 inch w.g. positive static pressure, except where noted otherwise on Drawings.
 - b. Return and Exhaust Ducts: 2 inch w.g. negative static pressure, except where noted otherwise on Drawings.
 4. Duct Joints:
 - a. Seams: Longitudinal or spiral, in accordance with SMACNA HVAC Duct Construction Standards. Longitudinal seams shall be spot welded. Snaplock not acceptable.
 - b. Transverse Joints, except outdoors:
 - 1) Option 1: In accordance with details in SMACNA HVAC Duct Construction Standards "T-25" configuration or one of the following proprietary joint systems:
 - a) Ductmate "35" with DM 440 gasket tape.
 - b) Ductmate "45" with DM 440 gasket tape.
 - c) Ward Duct Connectors Inc. "WDCI Lite" with butyl gasket tape.
 - d) Ward Duct Connectors Inc. "WDCI Heavy" with butyl gasket tape.
 - e) "Spinfinity AccuFlange."
 - 2) Option 2: Slip joints, crimped or expanded.
 - c. Transverse Joints, Outdoors: SMACNA "T-24" flanged joint or approved proprietary joint system. Outdoor joints shall have continuous cleats for complete coverage of flanges on top and sides of duct.
 5. Material Thickness: In accordance with tables in SMACNA HVAC Duct Construction Standards, based on duct diameter, duct material, pressure class, and seam type.
 6. Sealing Requirements: Seal transverse joints with tape-and-adhesive or liquid duct sealer, specified herein. Not required for gasketed, flanged joints.
 7. Fittings: Refer to details on Drawings.
- D. Rectangular Ducts, Outdoors:
1. Construction: Double wall galvanized steel.
 2. Fabricate and support in accordance with latest editions of:
 - a. Oregon Mechanical Specialty Code
 - b. SMACNA HVAC Duct Construction Standards
 3. Pressure Classification: 4 inch w.g. positive static pressure, except where noted otherwise on Drawings.
 4. Seam Type: Longitudinal seams pittsburg lock, transverse joints flanged.
 5. Construction: Factory fabricated double-wall insulated ductwork with solid sheetmetal outer pressure shell and a perforated sheetmetal inner liner with insulation sandwiched between. Inner shell shall be supported on spacers where required by SMACNA Standards to prevent compression of insulation.
 6. Crossbreaking or Rollbeading:
 - a. Duct panels 16 inches wide and larger shall be rollbeaded or crossbroken, regardless of whether or not duct is lined or insulated.
 - b. Rollbeads shall be 1/8 inch deep, shall be parallel to transverse joints on tops of outdoor ducts, and shall be spaced maximum 12 inches on centers.
 - c. Ducts shall be crossbroken on top panels, to drain water.
 7. Material Thickness: In accordance with tables in SMACNA HVAC Duct Construction Standards, based on duct diameter, duct material, and pressure class.
 8. Sealing Requirements: Seal transverse and longitudinal joints with shop-injected liquid duct sealer, specified herein. Not required for gasketed, flanged joints.
 9. Internal Insulation:
 - a. Insulation Type: 2 inch thick fiberglass, factory installed by duct manufacturer.
 10. Fittings:
 - a. For fabrication details refer to Details on Drawings.
 - b. Fittings to be factory-fabricated by duct manufacturer.
 11. Manufacturer: United McGill Corporation "Rectangular k-27," ROLOK Products, or approved.

- E. Flexible Duct:
 - 1. Pressure Rating: 6 inch w.g. positive, 1/2 inch w.g. negative.
 - 2. Core: Steel or aluminum helix bonded to continuous liner.
 - 3. Insulation: Fiberglass blanket between core and outer jacket.
 - 4. Thermal Conductance: 0.24 btuh/sq ft/deg. F max.
 - 5. Vapor Barrier Outer Jacket: Seamless polymer.
 - 6. Connect and support in accordance with latest editions of:
 - a. Oregon Mechanical Specialty Code
 - b. SMACNA HVAC Duct Construction Standards
 - 7. U.L. Listing: U.L. 181 Class 1 Air Duct.
 - 8. Manufacturer:
 - a. Flexmaster Type 3
 - b. ATCO UPC #070
 - c. Thermaflex G-KM
 - d. Hart & Cooley F114
- F. Liquid Duct Sealer, Indoors:
 - 1. U.L. Classification: Flame spread rating not to exceed 25; smoke developed rating not to exceed 50; when applied in a 2 inch wide strip at a thickness of 0.0032 inch.
 - 2. Low-Emitting Material: Volatile organic compound (VOC) content less than 30 grams per liter for metal-to-metal bonding per SCAQMD Rule #1168.
 - 3. Application Temperature Limits: 40 to 110 deg. F.
 - 4. Manufacturer: United McGill Corp., Accumetric, Vulkem, Carlisle Hardcast, Alcoa, Design Polymerics, Miracle Adhesives, Ductmate, or approved. Similar to Accumetric Boss 350.
- G. Tape-and-Adhesive Duct Sealer, Indoors:
 - 1. U.L. Classification: Flame spread rating not to exceed 25; smoke developed rating not to exceed 50; when applied in a 2 inch wide strip at a thickness of 0.0032 inch.
 - 2. Application Temperature Limits: 30 to 110 deg. F.
 - 3. Manufacturer:
 - a. Hardcast Inc. DT tape with FTA-20 adhesive
 - b. United McGill MDT6-300 tape with MTA-20 adhesive
- H. Tape-and-Adhesive Duct Sealer, Outdoors:
 - 1. Application Temperature Limits: 30 to 110 deg. F.
 - 2. Manufacturer:
 - a. Hardcast Inc. DT tape with RTA-50 adhesive
 - b. United McGill MDT6-300 tape with MTC-50 adhesive

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.
- B. Provide duct fittings and offsets not shown on Drawings, if required for coordination with the work of other sections.
- C. Install products in accordance with Manufacturer's recommendations and standards referenced herein.
- D. Duct sizes on Drawings are net inside dimensions, measured to inside face of internal liner or internal insulation.
- E. Fabricate and install ductwork to minimize gaps. Gaps in sheetmetal shall be no larger than allowed for sealant per sealant manufacturer's installation instructions.

3.02 DUCT AND FITTING HANDLING

- A. Delivery to Site:
 - 1. At site, sealed ends shall be visually examined and resealed as required.
- B. Storage:
 - 1. Store away from high dust generating processes.
 - 2. Provide pallets or blocking to keep above floor.
 - 3. Provide temporary cover to protect stored material.
- C. Installation:
 - 1. Protective coverings shall be removed immediately before installation and inspected to determine if wipe down is necessary.
 - 2. During construction, provide temporary sealing of openings into duct systems, to prevent accumulation of dust in ducts.
 - 3. Open ends of completed duct and overnight work-in-progress shall be sealed.

3.03 DUCT SEALANTS

- A. Clean duct surfaces prior to applying sealant.
- B. Prior to application, verify that ducts are dry and within specified temperature limits.
- C. Inspect after first application of sealant to identify areas where shrinkage has occurred. Fill voids with a second application.

3.04 FLEXIBLE DUCT

- A. Installation to conform to SMACNA HVAC Duct Construction Standards.
- B. Maximum Length: 6 feet, unless noted otherwise on Drawings.
- C. Limitations to Use: Flexible duct shall not be substituted for round or rectangular duct indicated on Drawings. Flexible duct is acceptable only where shown on Drawings.
- D. Connections to Collars: Secure core with stainless steel or nylon drawband under the insulation. Secure vapor barrier with an additional stainless steel or nylon drawband outside of insulation.

END OF SECTION

SECTION 23 33 00

DUCTWORK ACCESSORIES

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 23 31 00 - Ductwork

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data), including documentation of ORS 453.005 (7) (e) compliance.
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Volume Dampers		X						
Turn Vanes		X						
Backdraft Dampers	X	X		X				
Flexible Duct Connectors		X						
Twist-lock Fittings		X						

Part 2 - Products

2.01 VOLUME DAMPERS

- A. Volume Dampers, up to 10 inch width, internally lined or uninsulated ducts:
 - 1. Blade: Minimum 22 ga. galvanized steel.
 - 2. Regulator: Quadrant type, 1/4 inch square shaft, hex nut lock, indicator dial marked "open" and "shut".
 - 3. Bearings: 1/4 inch square shaft, spring-lock on tail bearing.
 - 4. Regulator/Bearing Set Manufacturer: Duro-dyne SRHS-148, or approved.
- B. Volume Dampers, up to 10 inch width, externally insulated ducts:
 - 1. Blade: Minimum 22 ga. galvanized steel.

2. Regulator: Quadrant type, 1/4 inch square, hex nut lock, indicator dial marked "open" and "shut", 1-1/2 inch standoff bracket.
 3. Bearings: 1/4 inch square shaft, spring-lock on tail bearing.
 4. Regulator/Bearing Set Manufacturer: Duro-dyne SRST 1-1/2-148 standoff with SRHS-148 regulator, or approved.
- C. Volume Dampers, 11 inch to 20 inch width, internally lined or uninsulated ducts:
1. Blade: Minimum 18 ga. galvanized steel. Use multiple blades for height over 12 inches.
 2. Regulator: Quadrant type, 3/8 inch square shaft, hex nut lock, indicator dial marked "open" and "shut".
 3. Bearings: 3/8 inch square shafts, spring-lock on tail bearing.
 4. Regulator/Bearing Set Manufacturer: Duro-dyne SRHS-388, or approved.
- D. Volume Dampers, 11 inch to 20 inch width, externally insulated ducts:
1. Blade: Minimum 18 ga. galvanized steel. Use multiple blades for height over 12 inches.
 2. Regulator: Quadrant type, 3/8 inch square shaft, hex nut lock, indicator dial marked "open" and "shut", 1-1/2 inch standoff bracket.
 3. Bearings: 3/8 inch square shafts, spring-lock on tail bearing.
 4. Regulator/Bearing Set Manufacturer: Duro-dyne SRST 1-1/2-388 standoff with SRHS-388 regulator, or approved.
- E. Opposed Blade Volume Dampers:
1. Damper Assembly:
 - a. Type: V-crimped galvanized steel.
 - b. Blade Action: Opposed blade as noted on Drawings.
 - c. Blades: 6 inches wide, v-crimped, 16 ga. galvanized steel.
 - d. Frames: 16 ga. galvanized steel or extruded aluminum.
 - e. Blade-to-blade Linkage: Concealed within frame.
 - f. Blade Axles: 1/2 inch square zinc-plated steel.
 - g. Bearings: Oil-impregnated sintered bronze or molded synthetic.
 - h. Control Shaft: 1/2 inch square, extends 6 inches beyond frame.
 - i. Performance Ratings: Certified in accordance with AMCA Standard 500.
 - j. Manufacturer: Ruskin, Greenheck, Cesco, or approved. Similar to Ruskin CD35.
 2. Regulator: Quadrant type, 1/2 inch square shaft size, wing nut lock, indicator dial marked "open" and "shut". Duro-dyne K-5, or approved.

2.02 TURN VANES

- A. Turn Vanes, 20 inch and less duct width:
1. Arrangement: Stationary vanes fixed to side rails installed in 90 degree square elbows.
 2. Vane and Rail Material: Galvanized steel.
 3. Vanes: Double wall, minimum 26 gauge, 90 degree, 2-inch throat radius.
 4. Rails: Minimum 24 gauge, 1-1/2 inch on center vane spacing.
 5. Manufacturer: Durodyne, Ductmate, Hardcast, Ward Industries, Cain, or approved. Similar to Durodyne Junior Vane Rail JVR2.
- B. Turn Vanes, greater than 20 inch duct width:
1. Arrangement: Stationary vanes fixed to side rails installed in 90 degree square elbows.
 2. Vane and Rail Material: Galvanized steel.
 3. Vanes: Double wall, minimum 24 gauge, 90 degree, 4-1/2 inch throat radius.
 4. Rails: Minimum 24 gauge, 3-1/4 inch on center vane spacing.
 5. Manufacturer: Durodyne, Ductmate, Hardcast, Ward Industries, Cain, or approved. Similar to Durodyne Vane Rail VR2.

6. Duct Connection Collars: Rectangular, round, or oval, as required to match ducts indicated on Drawings.
7. Sealant: Dampers with round or oval duct connection collars shall have factory applied sealant at collar connections and at all seams.
8. Mounting Position: Vertical or horizontal, as indicated on Drawings. Provide spring closure and latches for horizontal mount dampers.
9. Manufacturer: Ruskin, Greenheck, Air Balance, Cesco, Prefco, Safe Air, Nailor, or approved. Similar to Ruskin IBD Series.

2.03 BACKDRAFT DAMPERS

- A. Backdraft Damper:
 1. Frame: Extruded aluminum channel.
 2. Blades: Extruded aluminum.
 3. Seals: Vinyl edge.
 4. Manufacturer: Ruskin, Cesco, Dowco, Greenheck, or approved. Similar to Ruskin type BD6.
- B. Backdraft Damper:
 1. Frame: Steel or aluminum channel.
 2. Blades: 0.070 inch thick aluminum with felt or vinyl edges.
 3. Counterbalance Weights: Adjustable, to operate damper in range of 0.01 to 0.05 w.g.
 4. Coating: Rust inhibitor on ferrous materials.
 5. Manufacturer: Ruskin, Cesco, Dowco, Greenheck, or approved. Similar to Ruskin Type CBD-4.
- C. Automatic Dampers, insulated shutoff (A1):

2.04 FLEXIBLE DUCT CONNECTORS

- A. Flexible Duct Connectors:
 1. Assembly: Two 3 inch wide strips of metal connected to 3 inch wide strip of fabric with continuous crimped seams.
 2. Metal Strips: 24 gauge galvanized steel.
 3. Fabric Strip:
 - a. Indoor: Glass fabric with black DuPont Neoprene coating, flame resistant, approximately 30 ounces per yard.
 - b. Outdoor: Glass fabric with white DuPont Hypalon coating, flame resistant, UV resistant, approximately 26 ounces per yard.
 4. Manufacturer: Ventfabrics, Durodyne or approved. Similar to Durodyne "Metal-Fab".

2.05 TWIST LOCK FITTINGS

- A. Twist Lock Fittings:
 1. Type: Straight-neck "spin-in" for round take-off from rectangular duct.
 2. Damper: None. Volume dampers shall be separate from twist-lock fitting. Refer to volume damper specification in this Section.
 3. Manufacturer: Genflex, Flexmasterwest, Gensco, Western Stats, or approved. Similar to Flexmaster FL.

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.

3.02 FLEXIBLE DUCT CONNECTORS

- A. Provide flexible duct connectors where shown on Drawings and at connections to fans which are not internally spring isolated.

END OF SECTION

SECTION 23 37 00

AIR OUTLETS AND INLETS

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 20 91 00 - Testing, Adjusting, and Balancing

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data), including documentation of ORS 453.005 (7) (e) compliance.
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Grilles	X	X						
Registers	X	X						
Diffusers	X	X						

1.03 QUALITY ASSURANCE

- A. Products shall comply with the requirements of Oregon Revised Statute (ORS) 453.005 (7) (e), effective January 1, 2011. The referenced statute limits the use of three types of brominated fire retardant chemicals, which are defined as hazardous substances.

Part 2 - Products

2.01 GRILLES, REGISTERS, AND DIFFUSERS

- A. General:
 - 1. Refer to Drawings for types, neck sizes, and blow patterns.
- B. Supply Diffuser Ceiling (SDC-1):
 - 1. Type: Louvered face, adjustable from horizontal to vertical.
 - 2. Material: Steel or aluminum.

3. Face: Square, removable multi-louvered vane assembly.
 4. Blow Pattern: 4-way, 3-way, 2-way, or 1-way, as indicated on Drawings.
 5. Horizontal to Vertical Adjustment: By vertical movement of vane assembly or by movable deflectors in the vane assembly.
 6. Frame Type: Lay-In 24x24 module.
 7. Neck: Square.
 8. Finish: White.
 9. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus TDCA.
- C. Supply Diffuser Ceiling (SDC-2):
1. Type: Louvered face.
 2. Material: Steel or aluminum.
 3. Face: Square, removable multi-louvered vane assembly.
 4. Blow Pattern: 4-way, 3-way, 2-way, or 1-way, as indicated on Drawings.
 5. Frame Type: Surface-mount, beveled drop face
 6. Neck: Square.
 7. Finish: White.
 8. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus TDC.
- D. Supply Register Wall (SRW-1):
1. Type: Double deflection, individually adjustable blades.
 2. Material: Steel or aluminum.
 3. Border: 1-1/4 inch wide, countersunk screw holes, gasket.
 4. Front Blades: Spaced 3/4 inch on center maximum, parallel to long dimension.
 5. Rear Blades: Spaced 3/4 inch on center maximum, parallel to short dimension.
 6. Finish: White.
 7. Opposed Blade Damper: Adjustable through grille.
 8. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus 300RL.
- E. Return Grille Ceiling (RGC-1):
1. Type: Perforated face, lay-in.
 2. Material: Steel or aluminum.
 3. Face: 48x24, 24x24, or 24x12 module, removable, perforated, with 3/16 inch diameter holes on staggered 1/4 inch centers.
 4. Frame Type: Lay-In.
 5. Neck: 46x22, 22x22, or 22x10, as indicated on Drawings.
 6. Finish: White.
 7. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus PAR.
- F. Return Grille Ceiling (RGC-2):
1. Type: Perforated face, surface.
 2. Material: Steel or aluminum.
 3. Face: Square 12x12 module, removable, perforated, with 3/16 inch diameter holes on staggered 1/4 inch centers.
 4. Frame Type: Surface.
 5. Neck: 10x10.
 6. Finish: White.
 7. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus PAR.
- G. Return Grille Wall (RGW-1):
1. Type: Single deflection, fixed blades.
 2. Material: Steel or aluminum.
 3. Border: 1-1/4 inch wide, countersunk screw holes, gasket.

4. Blades: Spaced 3/4 inch on center maximum, parallel to long dimension.
 5. Blade Angle: Fixed, between 35 and 45 degrees.
 6. Finish: White.
 7. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus 350RL.
- H. Exhaust Grille Ceiling (EGC-1):
1. Type: Perforated face, lay-in.
 2. Material: Steel or aluminum.
 3. Face: 48x24, 24x24, or 24x12 module, removable, perforated, with 3/16 inch diameter holes on staggered 1/4 inch centers.
 4. Frame Type: Lay-In.
 5. Neck: 46x22, 22x22, or 22x10, as indicated on Drawings.
 6. Finish: White.
 7. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus PAR.
- I. Exhaust Grille Ceiling (EGC-2):
1. Type: Perforated face, surface.
 2. Material: Steel or aluminum.
 3. Face: Square 12x12 module or 24x24 module, removable, perforated, with 3/16 inch diameter holes on staggered 1/4 inch centers.
 4. Frame Type: Surface.
 5. Neck: 10x10.
 6. Finish: White.
 7. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus PAR.
- J. Transfer Grille Ceiling (TGC-1):
1. Type: Perforated face, surface.
 2. Material: Steel or aluminum.
 3. Face: Square 12x12 module or 24x24 module, removable, perforated, with 3/16 inch diameter holes on staggered 1/4 inch centers.
 4. Frame Type: Surface.
 5. Neck: 10x10.
 6. Finish: White.
 7. Manufacturer: Titus, Kreuger, Carnes, Tuttle & Bailey, Anemostat, E.H. Price, or approved. Similar to Titus PAR.

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.
- B. Secure grilles and registers with flat head, countersunk screws, flush with borders, painted to match borders. Hex head and/or bright finish screws are not acceptable.
- C. Install outlets and inlets tight to mounting surfaces.
- D. Center outlets and inlets between lights and in ceiling tiles, as shown on Architectural reflected ceiling plans.
- E. Install outlets and inlets plumb and square with walls and ceilings.
- F. Install return air grilles so that blades block vision through grille.
- G. Paint ductwork visible behind outlets and inlets matte black.

END OF SECTION

SECTION 23 72 00

HEAT RECOVERY UNITS

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 20 51 00 – Motors
- D. Section 20 52 00 - Variable Frequency Drives
- E. Section 23 40 00 - Air Cleaning Devices

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data), including documentation of ORS 453.005 (7) (e) compliance.
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Heat Recovery Units	X	X	X	X	X		X	X
Packaged Heat Recovery Units	X	X	X	X	X		X	X

- C. Shop drawing and Product Data shall include:
 - 1. Overall dimensions and weights of units.
 - 2. Casing materials, gauges, and finishes.
 - 3. Fan curves and performance data.
 - 4. Fan bearing types and specifications.
 - 5. Coil selection worksheet and performance data.
 - 6. Dimensions and arrangement of demountable sections.
 - 7. Fan vibration isolator types and ratings.
 - 8. Fan base seismic restraint details and calculations.
 - 9. Details and locations of lifting lugs / seismic anchor brackets.
 - 10. Damper specifications and sizes.
 - 11. Louver specifications and sizes.
 - 12. Sound data.
 - 13. Heat recovery section performance data.

14. Additional information as required to confirm compliance with specifications and drawings.

1.03 QUALITY ASSURANCE

- A. Products shall comply with the requirements of Oregon Revised Statute (ORS) 453.005 (7) (e), effective January 1, 2011. The referenced statute limits the use of three types of brominated fire retardant chemicals, which are defined as hazardous substances.

Part 2 - Products

2.01 HEAT RECOVERY UNITS

- A. ERV-1:
 1. Type: Flat plate air-to-air.
 2. Pressure rating: Minimum 10" pressure differential between air streams.
 3. Plate corners sealed with silicone, edges sealed both mechanically and with sealant to prevent cross air flow.
 4. Plates:
 - a. 0.008 inch thick aluminum.
 - b. Separators spaced at 2 inch intervals, full length of the plates.
 - c. Smooth surfaces with straight through air flow.
 5. Drain Pan: Below exhaust and supply side of exchanger, sloped to side connections.
 6. Face and Bypass damper: Opposed blade type, 16 gauge galvanized steel, with extruded vinyl edge seals and compressible metal jamb seals. Face and bypass integral with heat exchanger.
 7. Filters:
 - a. Filter Media Type/Thickness: High Efficiency Filters (MERV 13), 2-inch.
 8. Capacity: See schedule on Drawings.
 9. Manufacturer: Heatex, Xetex, or approved.

2.02 |

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 23 81 10

SPLIT SYSTEM AIR CONDITIONING UNITS

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 22 53 00 - Refrigerant Piping and Specialties

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data), including documentation of ORS 453.005 (7) (e) compliance.
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Air Conditioning Units	X	X	X	X	X		X	X
Thermostats		X	X					X

1.03 QUALITY ASSURANCE

- A. Products shall comply with the requirements of Oregon Revised Statute (ORS) 453.005 (7) (e), effective January 1, 2011. The referenced statute limits the use of three types of brominated fire retardant chemicals, which are defined as hazardous substances.

Part 2 - Products

2.01 AIR CONDITIONING UNITS (CU-1)

- A. General: Five year minimum compressor warranty.
- B. Outdoor Units:
 - 1. Cabinet: Galvanized steel, painted, with coil guards.
 - 2. Compressor: Direct drive, hermetic, reciprocating or scroll, internally isolated, overload protection.
 - 3. Condenser Fan: Direct drive, overload protection.

4. Condenser Coil: Aluminum or copper tubes bonded to aluminum fins. Wind baffle for low ambient operation.
 5. Refrigeration Components: Liquid line filter-drier, R-410A, service valves.
 6. Refrigerant Line Sets: Brazed connections, length as required, or provide refrigerant piping under Section 22 11 00.
 7. Electrical: Refer to schedule on Drawings.
 8. Capacity: Refer to schedule on Drawings.
- C. Indoor Units:
1. Cabinet: Horizontal unit for wall mounting, steel, enamel finish, fiberglass insulation.
 2. Evaporator Coil: Copper tubes, aluminum fins, condensate drain pan, expansion device.
 3. Blower: Direct drive, overload protection.
 4. Capacity: Refer to schedule on Drawings.
 5. Electrical: Refer to schedule on Drawings. Single point connection.
 6. Optional Equipment:
 - a. Manufacturer provided condensate pump 115V.
 - 1) Built-in sensor to shut off unit if drain clogs or pump fails.
 - 2) Similar to Mitsubishi SI2750.
- D. Controls: Factory installed transformer and terminal board with microprocessor controls. Condenser fan control for cooling operation down to zero degrees F. Space temperature sensor for field mounting or factory mounted in Indoor Unit.
- E. Manufacturer: Mitsubishi, Carrier, Daiken, Trane, or approved. Similar to manufacturer and model indicated in schedule on Drawings.

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.

END OF SECTION

SECTION 23 81 21

VARIABLE REFRIGERANT FLOW (VRF) HEAT PUMP SYSTEM

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals
- C. Section 22 23 00 - Refrigerant Piping and Specialties

1.02 QUALITY ASSURANCE

- A. Installing contractor must attend manufacturer's variable refrigerant flow installation and commissioning class prior to installing system. Contractor shall submit proof of attendance with equipment submittals.
- B. Manufacturer, sales representative and technical personnel selling and commissioning equipment specified herein will not be approved unless this experience can be demonstrated in the past five (5) years on similar VRF systems.

1.03 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. System refrigerant type and charge (lbs. refrigerant / ton of gross cooling capacity) to be provided by the manufacturer and / or installer as part of the Shop Drawings/Product Data Submittal and also submitted as part of the Record Documents at project closeout to show compliance with ASHRAE Standard 15 and 34.
- C. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data)
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
VRF Heat Pumps - Outdoor Unit	X	X	X	X	X		X	X
VRF Heat Pumps - Indoor Units	X	X	X	X	X		X	X
Thermostats and Controllers		X	X					
System Control Manager		X	X				X	
Refrigerant Line sets	X							
Refrigerant System Charge Calculations & Piping Isometrics	X						X	

Part 2 - Products

2.01 VARIABLE REFRIGERANT FLOW (VRF) HEAT PUMPS:

- A. General:
 - 1. Type: Variable capacity, variable refrigerant flow heat pump heat recovery system.
 - 2. Factory assembled integrated indoor and outdoor unit system including controls.
- B. Variable Refrigerant Flow Outdoor Unit (HP-1):
 - 1. Type: Air-to-air, with hermetically sealed inverter type, variable speed compressor.
 - 2. Minimum Operating Temperature: Capable of operating in heating down to 0°F ambient temperature without additional low ambient controls.
 - 3. Provide continuous heating during defrost and oil recovery cycles.
 - 4. Provide auto-charge function to measure the additional refrigerant required automatically.
 - 5. Backup function: Allows system to run at least 50% capacity for up to 24 hours if one compressor should fail.
 - 6. Provide anti-corrosion treatment on all metal parts and heat exchanger.
 - 7. The outdoor unit capable of serving a combined indoor evaporator capacity of up to 120% of the outdoor condensing unit capacity.
 - 8. Fan:
 - a. Single direct drive, variable speed propeller type fan capable of 0.30 ESP.
 - b. Fan motor shall have inherent protection, permanently lubricated bearings and be variable speed.
 - c. Fan shall be provided with a guards to prevent contact with moving parts.
 - 9. Compressor:
 - a. Type: Inverter driven scroll hermetic compressor.
 - b. Safety: Internal thermal overload.
 - c. Crankcase heater: Factory mounted on the compressor.
 - d. Capacity Control: Multi-step inverter modulates capacity to meet load fluctuation of indoor units. The capacity shall be completely variable down to 13% of rated capacity.
 - 10. Condenser fan control for cooling operation down to zero degrees F.
 - 11. Simultaneous Heating and Cooling:
 - a. System shall be capable of supplying heating and cooling simultaneously to adjacent zones on separately piped refrigerant circuits from the branch circuit distribution unit.
 - 12. Vibration Isolation Under Unit For Field Installation:
 - a. Neoprene waffle pad extending under full length of unit feet.
 - b. One or two layers neoprene ribbed or waffled pad. Thickness as recommended by manufacturer.
 - c. Bonded to galvanized steel load distribution plate.
 - d. Provide neoprene grommets and washers to prevent anchor bolt from short circuiting isolation.
 - e. Manufacturer: Mason Type Super "W", Kinetics, or approved equal.
- C. Variable Refrigerant Flow Indoor Units - Ceiling Concealed (Ducted) Units:
 - 1. General: Factory assembled, wired and run tested, consisting of factory wiring, piping, electronic modulating linear expansion device, control circuit board and fan motor.
 - 2. Ceiling Concealed Ducted Units: Horizontal draw-thru blower coil for installation in concealed soffit or attic space, with external ductwork connection flange.
 - 3. Fan:
 - a. Direct drive statically and dynamically balanced.
 - b. Multiple speed settings.
 - 4. Filters:
 - a. Washable, long-life with mildew-proof resin factory furnished by manufacturer.

- | | |
|-----------------------------------|--|
| City of Oregon City | VARIABLE REFRIGERANT FLOW (VRF) HEAT PUMP SYSTEM |
| Community Development Division TI | |
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H. System Control Manager:

1. Microprocessor based unit providing centralized control and monitoring of VRF system equipment.
2. Provide BACnet IP interface control hardware and software programmed to communicate with Owner's Campus Network.
3. Campus Network/Building Automation System (BAS) system interface:
 - a. Operation and monitoring points include but are not limited to: On/off, operation mode, fan speed, prohibit remote controller, filter sign reset, alarm state, error code and error address.
4. Basic Operation:
 - a. Capable of controlling by Area(s) or Group(s)
 - b. Group operations:
 - 1) On/Off
 - 2) Operation Mode (Cool, Heat, Fan, Dry, and Auto)
 - 3) Setpoint for current mode in the occupied period
 - 4) Setpoint Range Limitation
 - 5) Relative Setback for Cool and Heat modes during the unoccupied periods adjustable from 2 - 12°F
 - 6) The high and low relative setback setpoints
 - 7) Fan Speed
 - 8) Louver direction (dependent upon indoor unit type)
 - 9) Remote controller permit/prohibit of On/Off, Mode, and Setpoint
 - 10) Lock out setting for Manager display
 - 11) Provides battery backup power for the clock at least 1 year when no AC power is applied
5. Functions:
 - a. Support weekly schedule settings
 - b. 7 day weekly pattern
 - c. 100 independent schedules configurable with up to 20 events for each days schedule
 - d. Each scheduled event includes On/Off, Operation Mode, Occupied Setpoint, Pre-Cool, Pre-Heat, Setback High, Setback Low, Remote Controller On/Off Prohibit, Remote Controller Mode Prohibit, Remote Controller Setpoint Prohibit, Timer Extension Setting, Fan Speed, and Setpoint Range Limit
 - e. Relative Setback setpoints for Cool and Heat when unit is Off (unoccupied)
 - f. Timer Extension used for a timed override (settable from 30 – 180 minutes) to allow indoor unit operation during the unoccupied period
 - g. A maximum of 40 exception days can be scheduled on the yearly schedule (repeats yearly)
 - h. Exception days will be used to override specified days on the weekly schedule based upon irregular occupied/unoccupied conditions
 - i. Exception days can be configured on a set date (Jan 1) or floating date (1st Monday in September)
 - j. Auto-changeover
 - k. Auto-changeover provides Fixed, Operating, and Averaging changeover methods for both Heat Pump and Heat Recovery systems based upon the changeover group configuration. This shall allow for the optimal room temperature to be maintained by automatically switching the indoor unit's mode between Cool and Heat in accordance with the room temperature and setpoint
 - l. Interlock control
 - m. Interlock feature for use with 3rd party equipment (DOAS, dampers, occupancy sensing, etc) to automatically control Groups or Areas corresponding to the change of the operation states or the On/Off states of any Group.
 - n. Digital Input/Output unit capability with optional D/I/ modules
 - o. On/Off based monitoring and control of equipment
 - p. Manual or scheduled operation of equipment

- q. Operation based upon interlock with VRV indoor unit group(s)
- r. Monitor equipment error/alarm status
- s. Supports forced shutdown of associated indoor unit groups

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations. Follow manufacturer's specific installation and commissioning instructions.
- B. Electrical Wiring and Control Panel:
 - 1. See "Schematic Controls Wiring Diagram" shown on mechanical drawings. Provide wiring in accordance with Division 26 standards.
 - 2. Provide wall mounted lockable control panel to house VRF control components, BAS controller, transformers and other control devices required for the system.
 - 3. This Section to provide 18 ga. non-shielded two conductor copper control wiring between outdoor unit, indoor units and wall mounted thermostat/controllers.
 - 4. Power wiring provided by Division 26.
 - 5. Division 23 Contractor to verify actual electrical requirements with units provided on the project and coordinate with Division 26.
- C. Central branch controller/branch selector: Provide field installed shut-off valves for each branch to allow service of an indoor unit without interruption to overall system operation.
- D. Charge refrigerant system as recommended by manufacturer. Verify that system is holding refrigerant charge and that no leakage is detectable from service valves or piping. Comply with requirements in Section 22 53 00 Refrigerant Piping and Specialties.
- E. Provide installation and wiring of condensate pump and liquid detection sensor if furnished by manufacturer for field installation.
- F. Provide unit controller programming and initial operational scheduling.
 - 1. Initial Operational Scheduling (To be verified with users/project manager):
 - a. Occupied Time: 7:00 a.m. to 6:00 p.m. Monday through Friday.
 - b. Unoccupied Time: Weekends, Holidays and Times other than Occupied periods.
 - 2. Fan Operation:
 - a. Set indoor unit fan operation to continuous during occupied schedule and to cycle on/off to maintain room temperature setpoints during unoccupied periods.
 - 3. Initial thermostat settings (To be verified with users/project manager):
 - a. Occupied Space setpoints: Cooling = 73 deg F, Heating = 70 deg F.
 - b. Unoccupied Space setpoints: Cooling = 78 deg F, Heating = 60 deg F.

END OF SECTION

SECTION 23 82 16

DUCT AIR COILS

Part 1 - General

1.01 RELATED SECTIONS

- A. Section 20 10 00 - General Mechanical Provisions
- B. Section 20 20 00 - Mechanical Operation and Maintenance Manuals

1.02 SHOP DRAWINGS, PRODUCT DATA, OPERATION & MAINTENANCE DATA

- A. Submittals required for the products listed in the Product Table, in accordance with Section 20 10 00. Operation & Maintenance Information required as indicated in the Product Table in accordance with Section 20 20 00.
- B. Operation & Maintenance Information requirements indicated by number designation as follows. Refer to Section 20 20 00 for a description of each type of information.
 - 1. Shop Drawings (submittal data)
 - 2. Product Data (submittal data)
 - 3. Manufacturer's Operation Manuals
 - 4. Manufacturer's Service and Lubrication Requirements
 - 5. Service Contracts and Field Start-up Reports
 - 6. Cleaning, Certification, and Test Reports
 - 7. System Information
 - 8. Warranties

PRODUCT TABLE	Operation & Maintenance Information							
	1	2	3	4	5	6	7	8
Electric Duct Heaters	X	X				X		

Part 2 - Products

2.01 ELECTRIC DUCT HEATERS (EDH-1):

- A. Ratings: U.L. listed and labeled for zero clearance to combustible surfaces and meet latest National Electrical Code and ANSI standards.
- B. Coils:
 - 1. Type: Open Coil.
 - 2. Material: Grade A 80/20 nickel-chromium element with stainless steel or nickel coated terminals. Maximum coil power density of 50 watts per square inch. Element temperatures shall not exceed 400 deg F below the melting point of the element alloy when energized with design voltage in still, free air at 75 deg F.
 - 3. Allow for free ceramic expansion to prevent insulators from rupturing when heated.
- C. Frame and Terminal Box:
 - 1. NEMA 1, dust proof with gasket, and hinged cover.
 - 2. Mounting: Flanged or slip-in.
 - 3. Construction: 20 gauge minimum corrosion resistant steel. Hot dip galvanized after fabrication if spot welds are used.
 - 4. Control panel to be insulated to prevent condensation forming inside cabinet.

5. Heater/Control Panel position: Contractor shall verify correct heater/panel position to maintain accessibility and code clearances.
- D. Electrical:
1. Connection: Single point connection to terminal lugs.
 2. Disconnect Switch: Snap acting, with door interlock
 3. Capacity, Volts, Phase: As scheduled on Drawings.
 4. Thermal Cutouts: Disc type primary (automatic reset) and secondary (manual reset) thermal cutouts.
 5. Over-current Protection: Fuses rated at 125% of current rating, to protect each circuit.
- E. Controls:
1. Control type and stages as scheduled on Drawings.
- F. Accessories:
1. Control Transformer with fuse in primary voltage.
 2. Air pressure switch. Differential pressure diaphragm operated type. Switch to disable heater during no airflow.
- G. Manufacturer: Warren, Indeeco, Brasch, Redd-i-Heat, Markel, or approved.

Part 3 - Execution

3.01 GENERAL

- A. Install products in accordance with manufacturer's recommendations.

3.02 ELECTRIC DUCT HEATERS

- A. Internally Lined Duct Applications: Interrupt internal duct liner or provide sheet metal liner upstream and downstream of electric duct heater, in accordance with the Oregon Mechanical Specialty Code.

END OF SECTION

SECTION 321000
CONCRETE PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Concrete sidewalks, aggregate base course, stair steps, integral curbs, and gutters.

1.3 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).
- B. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000.
- C. ACI 305R - Hot Weather Concreting; 2010.
- D. ACI 306R - Cold Weather Concreting; 2010.
- E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2015.
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2015.
- G. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2013.
- H. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2015a.
- I. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2015.
- J. ASTM C150/C150M - Standard Specification for Portland Cement; 2015.
- K. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2014.
- L. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a.
- M. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.

- N. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2013.
- O. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.
- P. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.
- Q. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004 (Reapproved 2013).
- R. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

1.4 SUBMITTALS

- A. See Section 013300 - Submittals, for submittal procedures.
- B. Product Data: Provide data on joint filler, admixtures, and curing compound.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with ACI 301.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 - PRODUCTS

2.1 PAVING ASSEMBLIES

- A. Comply with applicable requirements of ACI 301.
- B. Concrete Sidewalks and Curbs: 3,000 psi 28 day concrete, 4 inches thick, buff color Portland cement, exposed aggregate finish.
- C. Concrete Stairs: 3,000 psi 28 day concrete, 4 inches thick, buff color Portland cement, exposed aggregate finish.
- D. Geotextile Fabric: Non-biodegradable
 - 1. Woven: GEOTEX200ST or approved equal with laps per manufacturer's specification.

- E. Miscellaneous Items (Sign Post Foundations, Flag Poles, etc.): As indicated on plans.

2.2 FORM MATERIALS

- A. Form Materials per ACI 301.
- B. Joint Filler: Preformed; non-extruding bituminous type (ASTM D1751) or sponge rubber or cork (ASTM D1752).
 - 1. Thickness: 1/2 inch.

2.3 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615/A615M, Grade 80 (80,000 psi) yield strength; deformed billet steel bars; unfinished.
- B. Steel Welded Wire Reinforcement: Plain type, ASTM A1064/A1064M; in flat sheets; unfinished.
- C. Dowels: ASTM A615/A615M, Grade 40 - 40,000 psi yield strength; deformed billet steel bars; unfinished finish.

2.4 CONCRETE MATERIALS

- A. Obtain cementitious materials from same source throughout.

2.5 ACCESSORIES

- A. Curing Compound: ASTM C309, Type 1, Class A.

2.6 CONCRETE MIX DESIGN

- A. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Engineer for preparing and reporting proposed mix designs.
- B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
- C. Concrete Properties:
 - 1. Compressive strength, when tested in accordance with ASTM C39/C39M at 28 days; As indicated on drawings.
 - 2. For concrete surfaces in areas supporting vehicular traffic, such as roadway aprons and loading zones, the concrete shall have a low to moderate flexural strength (modulus of rupture: 550 psi). This property shall be identified in the mix design.
 - 3. Total Air Content: 6 percent, determined in accordance with ASTM C173/C173M.
 - 4. Maximum Slump: 4 inches.
 - 5. Maximum Aggregate Size: 3/4 inch.

2.7 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify compacted granular base is acceptable and ready to support paving and imposed loads.
- B. Verify substrate has been inspected, gradients and elevations are correct, and is dry.
- C. Verify gradients and elevations of base are correct.

3.3 PREPARATION

- A. Correct irregularities in substrate gradient and elevation by scarifying, reshaping, and re-compacting.
- B. Do not place aggregate on soft, muddy, or frozen surfaces.
- C. Moisten base to minimize absorption of water from fresh concrete.
- D. Notify Engineer minimum 24 hours prior to commencement of concreting operations.

3.4 INSTALLATION OF AGGREGATE BASE

- E. Place aggregate in maximum 8" layers and roller compact to specified density.
- F. Level and contour surfaces to elevations and gradients indicated.
- G. Add water to assist compaction. If excess water is apparent, remove aggregate and aerate to reduce moisture content.
- H. Use mechanical tamping equipment in areas inaccessible to compaction equipment.

3.5 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement. Hold top of pre-molded joint filler down 1/2" and seal upper 3/8" with approved joint seal material.

3.6 REINFORCEMENT

- A. Place reinforcement as indicated.
- B. Interrupt reinforcement at contraction joints.
- C. Place dowels to achieve pavement and curb alignment as detailed.

3.7 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.
- C. Place concrete continuously over the full width of the panel and between predetermined construction joints.
- D. Place concrete to specified pattern.

3.8 JOINTS

- A. Align curb, gutter, and sidewalk joints.
- B. Place 3/8 inch wide expansion joints at 15 foot intervals and to separate paving from vertical surfaces and other components and in pattern indicated.
 - 1. Form joints with joint filler extending from bottom of pavement to within 1/2 inch of finished surface.
 - 2. Secure to resist movement by wet concrete.
- C. Provide scored joints.
- D. Install joints as specified on the plan set.

3.9 FINISHING

- A. Area Paving: Light broom, texture perpendicular to pavement direction.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch radius.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- D. See plans for additional information relating to Finishing Requirements.
- E. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.10 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch in 10 ft.
- B. Maximum Variation From True Position: 1/4 inch.

3.11 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

3.12 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION

SECTION 321200
HOT MIX ASPHALT PAVING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Retain or delete this article in all Sections of Project Manual. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Single course asphalt concrete paving.
- B. Double course asphalt concrete paving.

1.3 RELATED REQUIREMENTS

- A. Section 312200 - Grading: Preparation of site for paving and base.
- B. Section 312323 - Fill: Compacted subgrade for paving.
- C. Section 321123 - Aggregate Base Courses: Aggregate base course.
- D. Section 321313 - Concrete Paving: Concrete curbs.
- E. Section 321723.13 - Painted Pavement Markings: Pavement markings.

1.4 REFERENCE STANDARDS

- A. Reference: Geotechnical Report prepared for Sunnyside Elementary School by Intertek-PSI.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with State of Oregon Highways standard.
- B. Mixing Plant: Conform to State of Oregon Highways standard.
- C. Obtain materials from same source throughout.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code for paving work on public property. Coordinate all work within Public Right-of-Way with City inspector

1.7 FIELD CONDITIONS

- A. Do not place asphalt when ambient air or base surface temperature is less than

40 degrees F, or surface is wet or frozen.

PART 2 –PRODUCTS

2.1 MATERIALS

- A. Asphalt Cement shall conform with Oregon Standard Specifications for Construction - Section 00744.11.
- B. Aggregate Materials shall conform with Oregon Standard Specifications for Construction - Section 00744.10.
- C. Mix Type and Broadband Limits shall conform with Oregon Standard Specifications for Construction - Section 00744.12.
- D. Job Mix Formula (JMF) Requirements: Job mix formula requirements shall conform with Oregon Standard Specifications for Construction - Section 00744.13.
- E. Tolerances and Limits: Tolerance and limits shall conform with Oregon Standard Specifications for Construction - Section 00744.14.
- F. HMAC Acceptance: HMAC acceptance shall conform with Oregon Standard Specifications for Construction - Section 00744.16.
- G. Aggregate for Base Course: In accordance with State of Oregon Highways standards.

2.2 EQUIPMENT

- A. Compactors: Compactors shall conform with Oregon Standard Specifications for Construction - Section 00744.24.

2.3 LABOR

- A. Quality Control Personnel: Provide quality control personnel in accordance with Oregon Standard Specifications for Construction - Section 00744.30.

2.4 ASPHALT PAVING MIXES AND MIX DESIGN

- A. Base Course: State of Oregon Highways standards, Level 2, 1/2" dense graded
- B. Wearing Course: State of Oregon Highways standards, Level 2, 1/2" dense graded
- C. Submit proposed mix design for review prior to beginning of work.

2.5 SOURCE QUALITY CONTROL

- A. Test mix design and samples in accordance with ODOT/APWA Standard Specifications for Construction..

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify that compacted subgrade is dry and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 BASE COURSE

- A. Place and compact base course.

3.3 PREPARATION - TACK COAT

- A. Apply tack coat in accordance with manufacturer's instructions.
- B. Apply tack coat on asphalt or concrete surfaces over subgrade surface at uniform rate of 1/3 gal/sq yd.
- C. Apply tack coat to contact surfaces of curbs, gutters and other vertical edges.
- D. Coat surfaces of manhole frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

3.4 PLACING ASPHALT PAVEMENT - SINGLE COURSE

- A. Install Work in accordance with State of Oregon Highways standards.
- B. Place to 3 inch compacted thickness.
- C. Install gutter drainage grilles and frames in correct position and elevation.
- D. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.
- E. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.5 PLACING ASPHALT PAVEMENT - DOUBLE COURSE

- A. Place asphalt binder course within 24 hours of applying primer or tack coat.
- B. Place binder course to 4.5 inch compacted thickness.
- C. Place wearing course within two hours of placing and compacting binder course.
- D. Place wearing course to thickness identified in schedule at end of section.
- E. Install gutter drainage grilles and frames in correct position and elevation.
- F. Compact pavement by rolling to specified density. Do not displace or extrude

pavement from position. Hand compact in areas inaccessible to rolling equipment.

- G. Perform rolling with consecutive passes to achieve even and smooth finish, without roller marks.

3.6 TOLERANCES

- A. Flatness: Maximum variation of 1/4 inch measured with 10 foot straight edge.
- B. Compacted Thickness: Within 1/4 inch of specified or indicated thickness.
- C. Variation from True Elevation: Within 1/4 inch.

3.7 FIELD QUALITY CONTROL

- A. See Section 014000 - Quality Requirements, for general requirements for quality control.
- B. Provide field inspection and testing. Take samples and perform tests in accordance with ODOT/APWA Standards.

3.8 PROTECTION

- A. Immediately after placement, protect pavement from mechanical injury for 5 days or until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 321700
PAINTED PAVEMENT MARKINGS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Retain or delete this article in all Sections of Project Manual. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Parking lot markings, including parking bays, crosswalks, arrows, handicapped symbols, and curb markings.
- B. Roadway lane markings and crosswalk markings.
- C. "No Parking" curb painting.

1.3 RELATED REQUIREMENTS

- A. Section 321000 - Concrete Paving.

1.4 REFERENCE STANDARDS

- A. FS TT-P-1952 - Paint, Traffic Black, and Airfield Marking, Waterborne; Rev. E, 2007.
- B. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; current edition, www.paintinfo.com.
- C. FHWA MUTCD - Manual on Uniform Traffic Control Devices for Streets and Highways; U.S. Department of Transportation, Federal Highway Administration; Current Edition.

1.5 SUBMITTALS

- A. See Section 013300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Certificates: Submit for each batch of paint and glass beads stating compliance with specified requirements.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Paint: 2 containers, 1 gallon size, of each type and color.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver paint in containers of at least 5 gallons accompanied by batch certificate.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 FIELD CONDITIONS

- A. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Line and Zone Marking Paint: MPI (APL) No. 97 Latex Traffic Marking Paint; color(s) as indicated.
 1. Roadway Markings: As required by authorities having jurisdiction.
 2. Parking Lots: Yellow.
 3. Handicapped Symbols: Blue.
- B. Paint For Obliterating Existing Markings: FS TT-P-1952; black for bituminous pavements, gray for portland cement pavements.
- C. Temporary Marking Tape: Preformed, reflective, pressure sensitive adhesive tape in color(s) required; Contractor is responsible for selection of material of sufficient durability as to perform satisfactorily during period for which its use is required.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 14 days before application of marking materials.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Obliteration of existing markings using paint is acceptable in lieu of removal on

the private site only (not within the public right-of-way); apply the black paint in as many coats as necessary to completely obliterate the existing markings.

- D. Clean surfaces thoroughly prior to installation.
 - 1. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods.
 - 2. Completely remove rubber deposits, existing paint markings, and other coatings adhering to the pavement, by scraping, wire brushing, sandblasting, mechanical abrasion, or approved chemicals.
- E. Where oil or grease are present, scrub affected areas with several applications of trisodium phosphate solution or other approved detergent or degreaser, and rinse thoroughly after each application; after cleaning, seal oil-soaked areas with cut shellac to prevent bleeding through the new paint.
- F. Establish survey control points to determine locations and dimensions of markings; provide templates to control paint application by type and color at necessary intervals.
- G. Temporary Pavement Markings: When required or directed by Engineer, apply temporary markings of the color(s), width(s) and length(s) as indicated or directed.
 - 1. After temporary marking has served its purpose, remove temporary marking by carefully controlled sandblasting, approved grinding equipment, or other approved method so that surface to which the marking was applied will not be damaged.

3.3 INSTALLATION

- A. Begin pavement marking as soon as practicable after surface has been cleaned and dried.
- B. Apply in accordance with manufacturer's instructions using an experienced technician that is thoroughly familiar with equipment, materials, and marking layouts.
- C. Comply with FHWA MUTCD manual (<http://mutcd.fhwa.dot.gov>) for details not shown.
- D. Apply markings in locations determined by measurement from survey control points; preserve control points until after markings have been accepted.
- E. Apply uniformly painted markings of color(s), lengths, and widths as indicated on the drawings true, sharp edges and ends.
 - 1. Apply paint in two coats.
 - 2. Wet Film Thickness: 0.015 inch, minimum.
 - 3. Width Tolerance: Plus or minus 1/8 inch.
- F. Roadway Traffic Lanes: Use suitable mobile mechanical equipment that provides constant agitation of paint and travels at controlled speeds.
 - 1. Conduct operations in such a manner that necessary traffic can move without hindrance.
 - 2. Place warning signs at the beginning of the wet line, and at points well in

advance of the marking equipment for alerting approaching traffic from both directions. Place small flags or other similarly effective small objects near freshly applied markings at frequent intervals to reduce crossing by traffic.

3. If paint does not dry within expected time, discontinue paint operations until cause of slow drying is determined and corrected.
 4. Skip Markings: Synchronize one or more paint "guns" to automatically begin and cut off paint flow; make length of intervals as indicated.
 5. Use hand application by pneumatic spray for application of paint in areas where a mobile paint applicator cannot be used.
- G. Parking Lots: Apply parking space lines, entrance and exit arrows, painted curbs, and other markings indicated on drawings.
1. Mark the International Handicapped Symbol at indicated parking spaces.
 2. Hand application by pneumatic spray is acceptable.
- H. Symbols: Use a suitable template that will provide a pavement marking with true, sharp edges and ends, of the design and size indicated.

3.4 DRYING, PROTECTION, AND REPLACEMENT

- A. Protect newly painted markings so that paint is not picked up by tires, smeared, or tracked.
- B. Provide barricades, warning signs, and flags as necessary to prevent traffic crossing newly painted markings.
- C. Allow paint to dry at least the minimum time specified by the applicable paint standard and not less than that recommended by the manufacturer.
- D. Remove and replace markings that are applied at less than minimum material rates; deviate from true alignment; exceed length and width tolerances; or show light spots, smears, or other deficiencies or irregularities.
- E. Remove markings in manner to avoid damage to the surface to which the marking was applied, using carefully controlled sand blasting, approved grinding equipment, or other approved method.
- F. Replace removed markings at no additional cost to Owner.

END OF SECTION

SECTION 328000

IRRIGATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of contract, including general and supplementary conditions and Division 01 specifications, apply to work of this section.
- B. References:
 - 1. American Society of Testing Materials (ASTM): cited section numbers.
 - 2. National Sanitation Foundation (NSF): rating system.
 - 3. Irrigation Association: Turf & Landscape Irrigation Best Management Practices

1.2 SUMMARY

- A. Irrigation system required for this work includes but is not limited to the furnishing of all labor, tools, materials, appliances, tests, permits, taxes, etc., necessary for the installation of a landscape irrigation system as herein specified and shown on the drawings, and the removal of all debris from the site.
 - 1. Locate, purchase, deliver and install piping, conduit, sleeves, 120 volt and low voltage electrical and water connections, valves, backflow preventer devices, controllers, rain sensors, spray and bubbler heads, drip irrigation lines, and associated accessories for a fully operational automatic irrigation system.
 - 2. Trenching and water settling of backfill material.
 - 3. Testing and startup of the irrigation system.
 - 4. Prepare an as built record set of drawings.
 - 5. Training of the Owner's maintenance personnel in the operational requirements of the Irrigation system.
 - 6. Clean up and disposal of all excess and surplus material.
 - 7. Maintenance of the irrigation system during the proscribed maintenance period.
- B. The system shall efficiently and evenly irrigate all areas and be complete in every respect and shall be left ready for operation to the satisfaction of the Owner's Representative.
- C. Coordinate with other trades, as needed to complete work, including but not limited to Water Meter, Point of Connection (POC) and Backflow Preventer Device (BFPD) location and electrical hookups.

1.3 CONTRACT DOCUMENTS

- A. Shall consist of specifications and its general conditions and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any part shall be as binding as if called for in all parts.

1.4 VERIFICATION

- A. Scaled dimensions are approximate only. Before proceeding with work, carefully check and verify dimensions and immediately notify the Owner's Representative of discrepancies between the drawings or specifications and the actual conditions. Although sizes and locations of plants are drawn to scale wherever possible, it is not within the scope of the drawings to show all necessary offsets, obstructions, or site conditions. The Contractor shall be responsible to install the work in such a manner that it will be in conformance to site conditions, complete, and in good working order.
- B. Piping and equipment is to be located within the designated planting areas wherever.

1.5 PERMITS AND REGULATIONS

- A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the Owner's Representative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.
- B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.
- C. In case of conflict among any referenced standards or codes or between any referenced standards and codes and the specifications, the more restrictive standard shall apply or Owner's Representative shall determine which shall govern.

1.6 PROTECTION OF WORK, PROPERTY AND PERSON

- A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's actions.

1.7 CHANGES IN THE WORK

- A. The Owner's Representative may order changes in the work, and the contract sum being adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.
- B. All changes in the work, notifications and Contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.8 CORRECTION OF WORK

- A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the

soonest as possible time that can be coordinated with other work, and seasonal weather demands, but not more than 90 (ninety) days after notification.

1.9 DEFINITIONS

- A. Owner's Representative: The person appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.
- B. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun. This date may be different that the date of substantial completion for the other sections of the project.
- C. Final Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of specification. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation work run concurrently.

1.10 SUBMITTALS

- A. See the contract General Conditions for policy and procedures related to submittals.
- B. Product data
 - 1. Submit a minimum of (3) complete lists of all irrigation equipment to be used, manufacturer's brochures, maintenance manuals, warranties and operating instructions, within 15 days after the notice to proceed.
 - a. This submission may be done digitally and all documents shall be submitted in one PDF document.
 - 2. The submittals shall be packaged and presented in an organized manner, in the quantity described in Division 1 of the specifications. Provide a table of contents of all submitted items.
 - 3. Clearly identify on each submitted sheet by underlining or highlighting (on each copy) the specific product being submitted for approval. Failure to clearly identify the specific product being submitted will result in a rejection for the entire submittal. No substitutions of material or procedures shall be made concerning these documents without the written consent of an accepted equivalent by the Owner's Representative.
 - 4. Equipment or materials installed or furnished without prior approval of the Owner's Representative, may be rejected by the Owner's Representative and the Contractor shall be required to remove such materials from the site at their own expense.
 - 5. Approval of substitution of material and/or products, other than those specified shall not relieve the Contractor from complying with the requirements of the contract documents and specifications. The Contractor shall be responsible, at their own expense, for all changes that may result from the approved substitutions, which affect the installation or operations other items of their own work and/or the work of other Contractors.

- C. Samples: Samples of the equipment may be required at the request of the Owner's Representative if the equipment is other than that specified.
- D. Other Submittals: Submit for approval:
 - 1. Documentation of the installer's qualifications.
 - 2. As built record set of drawings.
 - 3. Testing data from all required pressure testing.
 - 4. Backflow prevention device certification: Certification from the manufacturer or their representative that the back flow prevention device has been installed correctly according to the manufactures requirements.
 - 5. Booster pump certification: Certification from the manufacturer or their representative that the booster pump has been installed correctly according to the manufacturer's requirements.
 - 6. Irrigation controller certification: Certification from the manufacturer or an authorized distributor that the Controller has been installed correctly according to the manufactures requirements.

1.11 OBSERVATION OF THE WORK

- A. The Owner's Representative may inspect the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the Contractor.
- B. The Owner's Representative shall be informed of the progress of the work so the work may be observed at the following key times in the construction process. The Owner's Representative shall be afforded sufficient time to schedule visit to the site. Failure of the Owner's Representative to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.
 - 1. Trenching, directional boring, and sleeving review.
 - 2. Hydrostatic pressure testing.
 - 3. Adjustment and coverage test.
 - 4. Pre-maintenance observation.
 - 5. Final acceptance / system malfunction corrections.

1.12 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1.13 QUALITY ASSURANCE

- A. It is the intention of this specification to accomplish the work of installing an automatic irrigation system, which will operate in an efficient and satisfactory manner. The irrigation system shall be installed and made operational according to the workmanlike standards established for landscape installation and sprinkler irrigation operation as set forth by the most recent Best Management Practices (BMP) of the Irrigation Association.

- B. The specification can only indicate the intent of the work to be performed rather than a detailed description of the performance of the work. It shall be the responsibility of the Contractor to install said materials and equipment in such a manner that they shall operate efficiently and evenly and support optimum plant growth and health.
- C. The Owner's Representative shall be the sole judge of the true intent of the drawings and specifications and of the quality of all materials furnished in performance of the contract.
- D. The Contractor shall keep one copy of all drawings and specifications on the work site, in good order. The Contractor shall make these documents available to the Owner's Representative when requested.
- E. In the event of any discrepancies between the drawings and the specification, the final decision as to which shall be followed, shall be made by the Owner's Representative.
- F. In the event the installation is contradictory to the direction of the Owner's Representative, the installation shall be rectified by the Contractor at no additional cost to the Owner. The Contractor shall immediately bring any such discrepancies to the attention of the Owner's Representative.
- G. It shall be distinctly understood that no oral statement of any person shall be allowed in any manner to modify any of the contract provisions. Changes shall be made only on written authorization of the Owner's Representative.
- H. Installer Qualifications: The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the work.
 - 1. Installer Field Supervision: The installer shall maintain on site an experienced full-time supervisor who can communicate in English with the Owner's Representative.
 - 2. Submit the installer's qualifications for approval.

1.14 IRRIGATION SYSTEM WARRANTY:

- A. The Contractor shall Warrantee all workmanship and materials for a period of X year (s) following the acceptance of the work.
 - 1. Any parts of the irrigation work that fails or is defective shall be replaced or reconstructed at no expense to the Owner including but not limited to: restoring grades that have settled in trenches and excavations related to the work. Reconstruction shall include any plantings, soil, mulch or other parts of the constructed landscape that may be damaged during the repair or that results from soil settlement.
- B. The date of acceptance of the work and start of the Guarantee period shall be determined by the Owner's Representative, upon the finding that the entire irrigation system is installed as designed and specified, and found to be operating correctly, supplying water evenly to all planting and/or lawn areas.
- C. Neither the final acceptance nor any provision in the contract documents shall relieve the Contractor of responsibility for faulty materials or workmanship. The Contractor shall remedy any defects within a period of 7 days (s) from the date of notification of a defect.

1.15 SITE CONDITIONS

- A. It is the responsibility of the Contractor to be aware of all surface and sub-surface conditions, and to notify the Owner's Representative, in writing, of any circumstances that would negatively impact the installation of the work. Do not proceed with work until unsatisfactory conditions have been corrected.

1.16 DELIVERY, STORAGE, AND HANDLING

- A. All materials and equipment shall be stored properly and protected as required by the Contractor. The Contractor shall be entirely responsible for damages or loss by weather or other cause to work under the contract. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of the work.
- B. Deliver the products to the job site in their original unopened container with labels intact and legible at time of use.
- C. Store in accordance with the manufacturers' recommendations.

1.17 PROTECTION

- A. The Contractor shall continuously maintain adequate protection of all their work from damage, destruction, or loss, and shall protect the owner's property from damage arising in connection with this contract. Contractor shall make good any such damage, destruction, loss or injury. Contractor shall adequately protect adjacent property as provided by law and the contract documents.
- B. The Contractor shall maintain sufficient safeguards, such as railings, temporary walks, lights, etc., against the occurrence of accidents, injuries or damage to any person or property resulting from their work, and shall alone be responsible for the same if such occurs.
- C. All existing paving, structures, equipment or plant material shall be protected at all times, including the irrigation system related to plants, from damage by workers and equipment. The Contractor shall follow all protection requirements including plant protection provision of the general contract documents. All damages shall be repaired or replaced at the Contractor's expense. Repairs and or replacement shall be to the satisfaction of the Owner's Representative, including the selection of a Contractor to undertake the repair or maintenance. Repairs shall be at no cost to the owner.
 - 1. For trees damaged to the point where they will not be expected to survive or which are severely disfigured and that are too large to replace, the cost of damages shall be as determined by the Owner's arborist using accepted tree value evaluation methods.
- D. The Contractor shall refrain from trenching within the drip line of any existing tree to remain. The Owner's Representative may require the Contractor to relocate proposed irrigation work, bore lines beneath roots or use air spade technology to dig trenches through and under the root system to avoid damage to existing tree root areas.

1.18 EXCAVATING AROUND UTILITIES

- A. Contractor shall carefully examine the civil, record, and survey drawings to

become familiar with the existing underground conditions before digging.

1. Do not begin any excavation until all underground utilities have been located and marked.
2. Determine location of underground utilities and perform work in a manner that will avoid possible damage. Hand excavate, as required. Maintain stakes and or markings set by others until parties concerned mutually agree to their removal.

- B. Notification of *Oregon Utility Notification Center*, (503) 232-1987, is required for all excavation around utilities. The Contractor is responsible for knowing the location and avoiding utilities that are not covered by the *Oregon Utility Notification Center*.

1.19 POINT OF CONNECTION

- A. The point of connection of the irrigation system to its electrical power sources shall be provided by the irrigation installer. All connections shall be made by a licensed electrical Contractor per governing codes.
- B. The point of connection of the irrigation system to its potable and or non-potable water sources, including the main shutoff valve and backflow preventer shall be provided by the irrigation installer. All connections shall be made by a licensed Contractor per governing codes.

1.20 TEMPORARY UTILITIES

- A. All temporary piping, wiring, meters, panels and other related appurtenances required between source of supply and point of use shall be provided by the Contractor and coordinated with the Owner's Representative. Existing utilities may be used with the written permission of the owner.

1.21 CUTTING, PATCHING, TRENCHING AND DIGGING

- A. The Contractor shall do all cutting, fitting, trenching or patching of their work that may be required to make its several parts come together as shown upon, or implied by, the drawings and specifications for the completed project.
- B. Digging and trenching operations shall be suspended when the soil moisture is above field capacity.

1.22 USE OF PREMISES

- A. The Contractor shall confine their apparatus; the storage of materials, and the operations of their workers to limits indicated by the law, ordinances, or permits and shall not unreasonably encumber the premises with their materials.
- B. Contractor parking, and material and equipment storage shall be in areas approved by the Owner's Representative.

1.23 AS BUILT RECORD SET OF DRAWINGS

- A. Immediately upon the installation of any buried pipe or equipment, the Contractor shall indicate on the progress record drawings the locations of said pipe or equipment. The progress record drawings shall be made available at any time for

review by the Owner's Representative.

- B. Before final acceptance of work, the Contractor shall provide an as built record set of drawings showing the irrigation system work as built. The drawings shall be transmitted to the Owner's Representative in paper format and as a pdf file of each document on compact disk or flash drive. The drawings shall include all information shown on the original contract document and revised to reflect all changes in the work. The drawings shall include the following additional information.
 - 1. All valves shall be numbered by station and corresponding numbers shall be shown on the as built record set of drawings.
 - 2. All main line pipe or irrigation equipment including sleeves, valves, controllers, irrigation wire runs which deviate from the mainline location, backflow preventers, remote control valves, grounding rods, shut-off valves, rain sensors, wire splice locations, and quick coupling valves shall be located by two (2) measured dimensions, to the nearest one-half foot. Dimensions shall be given from permanent objects such as buildings, sidewalks, curbs, walls, structures and driveways. All changes in direction and depth of main line pipe shall be noted exactly as installed. Dimensions for pipes shall be shown at no greater than a 50 ft. maximum interval.
 - 3. As built record set of drawings shall be signed and dated by the Contractor attesting to and certifying the accuracy of the as built record set of drawings. As built record set of drawings shall have "As Built Record Set of Drawings", company name, address, phone number and the name of the person who created the drawing and the contact name (if different).
- C. The Owner shall make the original contract drawing files available to the Contractor.

1.24 CONTROLLER CHARTS:

- A. Provide one controller chart for each automatic controller installed.
 - 1. On the inside surface of the cover of each automatic controller, prepare and mount a color-coded chart showing the valves, main line, and systems serviced by that particular controller. All valves shall be numbered to match the operation schedule and the drawings. Only those areas controlled by that controller shall be shown. This chart shall be a plot plan, entire or partial, showing building, walks, roads and walls. The plan, reduced as necessary and legible in all details, shall be made to a size that will fit into the controller cover. This print shall be approved by the Owner's Representative and shall be protected in laminated in a plastic cover and be secured to the inside back of the controller cabinet door.
 - 2. The controller chart shall be completed and approved prior to acceptance of the work.

1.25 TESTING

- A. Provide all required system testing with written reports as described in part 3.

1.26 OPERATION AND MAINTENANCE MANUALS AND GUARANTEES

- A. Prepare and deliver to the Owner's Representative within ten calendar days prior to completion of construction, two 3-ring hard cover binders containing the following information:
 - 1. Index sheet stating Contractor's address and telephone number, list of equipment with name and addresses of local manufacturers' representatives.
 - 2. Catalog and parts sheets on all material and equipment.
 - 3. Guarantee statement. The start of the guarantee period shall be the date the irrigation system is accepted by the Owner.
 - 4. Complete operating and maintenance instruction for all major equipment.
 - 5. Irrigation product manufacturers warranties.
- B. In addition to the above-mentioned maintenance manuals, provide the Owner's maintenance personnel with instructions for maintaining major equipment and show evidence in writing to the Owner's Representative at the conclusion of the project that this has been rendered.

PART 2 – PRODUCTS

2.1 MATERIALS GENERAL

- A. All materials shall be of standard, approved and first grade quality and shall be new and in perfect condition when installed and accepted.

2.2 RECLAIMED WATER SYSTEM DESIGNATION

- A. Where irrigation systems use reclaimed water, all products including valve boxes, lateral and main line pipe, etc. where applicable and/or required by local code shall have the reclaimed water purple color designation.

2.3 PIPING MATERIAL

- A. Individual types of pipe and fittings supplied are to be of compatible manufacturer unless otherwise approved. Pipe sizes shown are nominal inside diameter unless otherwise noted.
- B. Plastic pipe:
 - 1. All pipe shall be free of blisters, internal striations, cracks, or any other defects or imperfections. The pipe shall be continuously and permanently marked with the following information: manufacturer's name or trade mark, size, class and type of pipe pressure rating, quality control identifications, date of extrusion, and National Sanitation Foundation (NSF) rating.
 - 2. Pressure main line for piping upstream of remote control valves and quick coupling valves:
 - a. Pipe smaller than 2 inch diameter shall be plastic pipe for use with solvent weld or threaded fittings. Shall be manufactured rigid virgin polyvinyl chloride (PVC) 1220, Type 1, Grade 2 conforming to ASTM D 1785, designated as Schedule 40.
 - b. Pipe 2 - 3 inch diameter shall be manufactured rigid virgin polyvinyl chloride (PVC), Type 1, Grade 2 conforming to ASTM D 1785, designated as bell gasket Class 315.
 - c. Pipe larger than 3 inch diameter shall be manufactured rigid virgin polyvinyl chloride (PVC), Type 1, Grade 2 conforming to

ASTM D 1785, designated as bell gasket Class 200 PVC.

3. Non-pressure lateral line for piping downstream of remote control valves: plastic pipe for use with solvent weld or threaded fittings. Shall be manufactured rigid virgin polyvinyl chloride PVC 1220 (type 1, grade 2) conforming to ASTM d 1785, designated as Class 200, 3/4" minimum size.
- C. Galvanized pipe shall be used for above ground connections to, backflow prevention device assemblies, hose bibs, and booster pumps and as shown on the plans and details.
 1. Pipe shall be hot dip galvanized continuous welded, seamless, Schedule 40 conforming to applicable current ASTM standards.

2.4 FITTINGS AND CONNECTIONS:

- A. Polyvinyl chloride pipe fittings and connections: Type II, Grade 1, Schedule 40, high impact molded fittings, manufactured from virgin compounds as specified for piping tapered socket or molded thread type, suitable for either solvent weld or screwed connections. Machine threaded fittings and plastic saddle and flange fittings are not acceptable. Furnish fittings permanently marked with following information: nominal pipe size, type and schedule of material, and National Sanitation Foundation (NSF) seal of approval. PVC fittings shall conform to ASTM D2464 and D2466.
- B. Brass pipe fittings, unions and connections: standard 125 pound class 85% red brass fittings and connections, IPS threaded.
- C. PVC Schedule 80 threaded risers and nipples: Type I, grade 1, Schedule 80, high impact molded, manufactured from virgin compounds as specified for piping and conforming to ASTM D-2464. Threaded ends shall be molded threads only. Machined threads are not acceptable.
- D. Galvanized pipe fittings shall be galvanized malleable iron ground joint Schedule 40 conforming to applicable current ASTM standards.

2.5 SOLVENT CEMENTS AND THREAD LUBRICANT

- A. Solvent cements shall comply with ASTM D2564. Socket joints shall be made per recommended procedures for joining PVC plastic pipe and fittings with PVC solvent cement and primer by the pipe and fitting manufacturer and procedures outlined in the appendix of ASTM D2564.
- B. Thread lubricant shall be Teflon ribbon-type, or approved equal, suitable for threaded installations as per manufacturer's recommendations.
- C. C. Pipe Joint Compound (Pipe dope) shall be used on all galvanized threaded connections. Pipe Joint Compound is a white colored, non-separating thread sealant compound designed to seal threaded connections against leakage due to internal pressure. It shall contain PTFE (Polytetrafluoroethylene) to permit a tighter assembly with lower torque, secure permanent sealing of all threaded connections and allow for easy disassembly without stripping or damaging threads.

2.6 BACKFLOW PREVENTION DEVICES

- A. The backflow prevention device shall be certified to NSF/ANSI 372 shall be ASSE Listed 1013, rated to 180 degree F, and supplied with full port ball valves.
- B. The main body and access covers shall be low lead bronze (ASTM B 584)
- C. The seat ring and all internal polymers shall be NSF Listed Noryl and the seat disc elastomers shall be silicone.

2.7 PRESSURE REGULATOR

- A. Pressure regulator shall certified to NSF/ANSI 372, consisting of low lead bronze body bell housing, a separate access cap shall be threaded to the body and shall not require the use of ferrous screws.
- B. The main valve body shall be cast bronze (ASTM B 584).
- C. The access covers shall be bronze (ASTM B 584 or Brass ASTM B 16)
- D. The assembly shall be of the balanced piston design and shall reduce the pressure in both flow and no flow conditions.

2.7. Wye Strainer

- A. Strainer shall conform to MIL -S-16293, and be ANSI 3rd party certified to comply with the states lead plumbing law 0.25% maximum weighted average lead content.
- B. The main body shall be low lead bronze (ASTM B 584)
- C. The access covers shall be yellow brass or cast bronze (ASTM B 16 or ASTM B 584)
- D. Strainer screen shall be 300 series stainless steel available in 20, 40, 60, 80, or 100 mesh.

2.8 BACKFLOW PREVENTER CAGE

- A. A heavy-duty steel mesh cage with rust proof finish. The caging shall be sized to allow space for the entire piping assembly associated with the Backflow Preventer unit, and all associated equipment.
- B. The cage shall include the manufacturers' standard tamper proof locking mechanism.

2.9 BOOSTER PUMP

- A. Booster pump, if required, shall be housed in a sturdy, locking, weather-resistant case, furnished for maximum exterior protection.

2.10 BALL VALVES

- A. Ball valves for 3/4 inch through 2-1/2 inch shall be of PVC, block, tru-union design with EDPDM seals and o-ring.
- B. Ball valves for 3 inch and larger shall be gate design and shall be iron body, brass or bronze mounted AWWA gate valves, and shall have a clear waterway equal to the full nominal diameter of the valve, and shall be rubber gasket, flanged or mechanical joint only, and shall be able to withstand a continuous working pressure of 150 PSI. Valve shall be equipped with a square-operating nut.
- C. All ball valves located in a valve manifold shall be the same size as the main line (1-1/2 inch size minimum). Provide pipe-reducing adapters down stream of valves, as required. All ball valves in line shall be the same size as the pipe.

2.11 CHECK VALVES

- A. Swing check valves 2 inch and smaller shall be 200 lbs., W.O.G., bronze construction with replaceable composition, neoprene or rubber disc and shall meet or exceed federal specification WW-V- 5ld, class a, type iv.
- B. Anti-drain valves shall be of heavy-duty virgin PVC construction with female iron pipe thread inlet and outlet. Internal parts shall be stainless steel and neoprene. Anti-drain valves shall be field adjustable against draw out from 5 to 40 feet of head.

2.12 REMOTE CONTROL VALVES

- A. Remote control valves shall be electrically operated, single seat, normally closed configuration, equipped with flow control adjustment and capability for manual operation.
- B. Valves shall be actuated by a normally closed low wattage solenoid using 24 volts, 50/60 cycle solenoid power requirement. Solenoid shall be epoxy encased. A union shall be installed on the discharge end.

2.13 MASTER CONTROL VALVES

- A. Master Control Valve shall be compatible with the irrigation controller.

2.14 FLOW SENSOR

- A. Flow sensor shall be compatible with the irrigation controller.

2.15 HYDROMETER

- A. Hydrometer shall be compatible with the irrigation controller.

2.16 QUICK COUPLER VALVES

- A. Quick coupler valves shall be a one or two piece, heavy-duty brass construction with a working pressure of 150 PSI with a built in flow control and a self-closing valve.
- B. Quick coupler shall be equipped with locking red brass cap covered with durable

yellow thermo-plastic rubber cover. Key size shall be compatible with quick coupler and of same manufacturer.

- C. Quick coupler valves shall be as indicated on the drawings.

2.17 SPRINKLER HEADS

- A. All sprinkler heads shall have check valves installed.
- B. Riser nipples for all sprinkler heads shall be the same size as the riser opening in the sprinkler body.

2.18 AUTOMATIC CONTROLLER

- A. Controller shall be housed in a sturdy, locking, weather-resistant case, furnished for maximum exterior protection.
- B. Controller shall be equipped with evapo-transpiration (ET) sensor, which adjusts the controller programming based on local climatic conditions. The sensor shall also have a rain sensing shut-off switch, wind sensing shut off switch, and freeze sensing shut-off of switch.
 - 1. If a moisture sensor is used in lieu of an evapo-transpiration sensor an additional sensor, which has a rain-sensing shut-off switch, wind sensing shut-off switch, and freeze sensing shut-off switch shall be provided.

2.19 CONTROLLER DECODERS

- A. All decoders shall be per the controller manufacturer's specifications.

2.20 ELECTRICAL CONTROL WIRING

- A. Low voltage
 - 1. The electrical control wire shall be direct burial type UF, no. 14 AWG, solid, single conductor, copper wire UL approved or larger, if required to operate system as designed.
 - 2. For 2-Wire controllers all irrigation wire for the controller, flow sensor, master valve, hydrometer, remote control valves and moisture sensors shall be per the controller manufacturer's specifications and recommendations.
 - 3. Color code wires to each valve. Common wire shall be white.
 - 4. If multiple controllers are being utilized, and wire paths of different controllers cross each other, both common and control wires from each controller to be of different colors.
 - 5. Control wire splices: Splices are when required shall be placed in splice boxes.
 - 6. Wire connections shall be per the controller manufacturer's specifications and recommendations.
- B. High voltage
 - 1. Shall be of type as required by local codes and ordinances.
 - 2. Shall be of proper size to accommodate needs of equipment it is to serve.

2.21 VALVE BOXES AND MATERIALS

- A. Valve boxes: valve boxes shall be constructed of ABS (acrylonitrile butadiene styrene) plastic, **green** in color, with rigid base and sides and shall be supplied with bolt lock cover secured with stainless steel bolts. Provide box extensions as required.
Master valves, flow sensors, remote control irrigation valves, gate valves, and ball valves 3 inch or less in size shall use a 14 inch x 19 inch x 12 inch rectangular box.
 - 1. Quick coupler valves, wire splices, and grounding rods shall use a 10 inch circular box.

2.22 CONCRETE THRUST BLOCKS

- A. Concrete thrust blocks shall be sized per the pipe manufactures requirement.

2.23 VALVE IDENTIFICATION TAGS

- A. Valve Identification Tags shall be 2.25 inch x 2.65 inch polyurethane. Color: potable water; yellow / Non-potable water; purple. Tags shall be permanently attached to each remote control valve with tamper proof seals as indicated on the drawings.

2.24 EQUIPMENT TO BE FURNISHED TO OWNER

- A. Two (2) sets of keys for each automatic controller.
- B. Two (2) 48 inch tee wrenches for operating the gate valves.
- C. Three (3) sets of special tools required for removing, disassembling and adjusting each type of sprinkler and valve supplied on this project.
- D. Five (5) Extra sprinkler heads, nozzles, shrub adapters, nozzle filter screens, for each type used on the project.
- E. Two (2) quick coupler keys to match manufacturer type of quick coupler.

2.25 INCIDENTAL MATERIALS AND EQUIPMENT

- A. Furnish all materials and equipment not specified above, but which are necessary for completion of the work as intended.

2.26 MAIN LINE LOCATOR TAPE

- A. 3 - inch wide plastic detectable locator tape.

2.27 MAIN LINE AND LATERAL LINE BEDDING SAND

- A. Sand shall consist of natural or manufactured granular material, free of organic material, mica, loam, clay or other substances not suitable for the intended purpose.
- B. Sand shall be masonry sand ASTM C 144 or coarse concrete sand, ASTM C 33.

PART 3 – EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Code requirements shall be those of state and municipal codes and regulations locally governing this work, providing that any requirements of the specifications, not conflicting therewith, but exceeding the code requirements, shall govern unless written permission to the contrary is granted by the Owner's Representative.
- B. Extreme care shall be exercised at all times by the Contractor in excavating and working in the project area due to existing utilities and irrigation systems to remain. Contractor shall be fully responsible for expenses incurred in the repair of damages caused by their operation.
 - 1. The Contractor is responsible for identifying and maintaining existing irrigation main lines that supply water to areas on the site and outside of the proposed limit of work. The Contractor shall relocate or replace existing irrigation main line piping as required to provide a continuous supply of water to all areas of existing irrigation on site.
 - a. Providing continuous water supply shall include hand watering and or the use of watering trucks to provide adequate water.
- C. Final site conditions and existing and proposed plantings shall determine final locations of backflow preventers, valves, controllers, irrigation lines, sleeves, spray heads and other equipment and adjusted as necessary and as directed to meet existing and proposed conditions and obtain complete water coverage.
- D. Stub out main line at all end runs.
- E. Connect new underground piping and valves and provide all flanges, adapters or other necessary fittings for connection.
- F. Permission to shut off any existing in-use water line must be obtained 48 hours in advance, in writing from the Owner. The Contractor shall receive instructions from the Owner's Representative as to the exact length of time of each shut-off.
- G. No fittings shall be installed on pipe underneath pavement or walls.
- H. Prior to starting any work, Contractor shall obtain a reading of existing static water pressure (no flow condition) at the designated point of connection and immediately submit written verification of pressure with date and time of recording to Owner's Representative.

3.2 TRENCHING, DIRECTIONAL BORING AND SLEEVING

- A. Perform all trenching, directional boring, sleeving and excavations as required for the installation of the work included under this section, including shoring of earth banks to prevent cave-ins.
- B. The Contractor may directional bore lines where it is practical or where required on the plans.
 - 1. Extend the bore 1' past the edge of pavement unless noted differently on the plans
 - 2. Cap ends of each bore and locate ends at finished grade using metal stakes.
 - 3. All boring and sleeving shall have detectable locator tape placed at the

ends of the pipe.

- C. Make trenches for mains, laterals and control wiring straight and true to grade and free of protruding stones, roots or other material that would prevent proper bedding of pipe or wire.
- D. Excavate trenches wide enough to allow a minimum of 4 - inch between parallel pipelines and 8 inch from lines of other trades. Maintain 3 - inch vertical clearance between irrigation lines. Minimum transverse angle is 45 degrees. All pipes shall be able to be serviced or replaced without disturbing the other pipes.
- E. Trenches for pipelines shall be made of sufficient depth to provide the minimum cover from finished grade as follows:
Pressure main line: 18 inches below finish grade and 24-30 inches below paved areas in Schedule 40 PVC sleeves.
Reclaimed water constant pressure main lines shall cross at least twelve (12) inches below potable water lines.
 - a. If a constant pressure reclaimed water main line must be installed above a potable water line or less than twelve (12) inches below a potable water line, then reclaimed water line shall be installed within an approved protective sleeve. The sleeve shall extend ten (10) feet from each side of the center of the potable line, for a total of twenty (20) feet. The sleeve shall be color-coded (purple) for use with reclaimed water.Lateral lines: 12 inches below finish grade and 18 inches below paved areas in Schedule 40 PVC sleeves.
Control wiring: to the side of pressure main line and 24 inches below paved areas in Schedule 40 PVC sleeves.
- F. On new on-site systems (post-meter), the required horizontal separation between potable water lines, reclaimed water constant pressure main lines and sewer lines shall be a minimum of four (4) feet apart as directed by the project engineer and/ or regulatory agency. Measurements shall be between facing surfaces, not pipe centerlines.
- G. When trenching through areas of imported or modified soil, deposit imported or modified soils on one side of trench and subsoil on opposite side.
- H. Backfill the trench per the requirements in paragraphs "Backfilling and Compacting" below.

3.3 PIPE INSTALLATION

- A. General Pipe Installation
Exercise caution in handling, loading and storing, of plastic pipe and fittings to avoid damage.
 - a. The pipe and fittings shall be stored under cover until using, and shall be transported in a vehicle with a bed long enough to allow the length of pipe to lay flat so as not to be subjected to undue bending or concentrated external load at any point.
 - b. All pipe that has been dented or damaged shall be discarded unless such dent or damaged section is cut out and pipe rejoined with a coupling.Trench depth shall be as specified above from the finish grade to the top of the

pipe.

Install a detectable pipe locator tape 6 to 8 inches above all main line pipes.

B. Polyvinyl Chloride Pipe (PVC) Installation

Under no circumstance is pipe to rest on concrete, rock, wood blocks, construction debris or similar items.

No water shall be permitted in the pipe until a period of at least 24 hours has elapsed for solvent weld setting and curing.

Install assemblies and pipe using first class workmanship and best standard practices as approved. All fittings that are necessary for proper connections such as swing joints, offsets, and reducing bushings shall be installed as necessary and directed as part of the work.

Dielectric bushings shall be used in any connections of dissimilar metals.

Gasketed plastic pipe: pipe-to-pipe joints or pipe to fittings shall be made in accordance with manufacturer's specifications.

Solvent weld or threaded plastic pipe:

- a. Installation of all pipe and fittings shall be in strict accordance with manufacturer's specifications.
- b. Pipe shall be cut using approved PVC pipe cutters only. Sawed joints are disallowed. All field cuts shall be beveled to remove burrs and excess before gluing.
- c. Welded joints shall be given a minimum of 15 minutes to set before moving or handling. Excess solvent on the exterior of the joint shall be wiped clean immediately after assembly.
- d. Plastic to metal connections shall be made with plastic adapters and if necessary, short (not close) brass threaded-nipples. Connection shall be made with two (2) wraps of Teflon tape and hand tightened plus one turn with a strap wrench.
- e. Snake pipe horizontally in trench to allow one (1) foot of expansion and contraction per 100 feet of straight run.
- f. Threaded pipe joints shall be made using Teflon tape. Solvent shall not be used with threaded joints. Pipe shall be protected from tool damage during assembly. All damaged pipe shall be removed and replaced. Take up threaded joints with light wrench pressure.
- g. No close nipples or risers are allowed. Cross connections in piping is disallowed.
- h. Center load pipe at 10 feet on center intervals with small amount of backfill to prevent arching and slipping under pressure. Other than this preliminary backfill all pipe joints, fittings and connections are to remain uncovered until successful completion of hydrostatic testing and written approval of the testing report.
- i. Concrete thrust blocks shall be constructed behind all pipe fittings 1-1/2 inch diameter and larger at all changes of direction of 45 degrees or more.

C. Galvanized Pipe Installation

All joints shall be threaded with pipe joint compound used on all threads.

Dielectric bushings shall be used in any connections of dissimilar metals.

3.4 TRENCHING, DIRECTIONAL BORING, AND SLEEVING REVIEW:

- A. Upon completion and installation of all trenching, directional boring, and sleeving, all installed irrigation control wiring, lines and fittings shall be visually observed by

the Owner's Representative unless otherwise authorized. Do not cover any wires, lines or fittings until they have been tested and observed by the Owner's Representative.

3.5 FLUSHING

- A. Openings in piping system during installation are to be capped or plugged to prevent dirt and debris from entering pipe and equipment. Remove plugs when necessary to flush or complete system.
- B. After completion and prior to the installation of any terminal fittings, the entire pipeline system shall be thoroughly flushed to remove dirt, debris or other material.

3.6 HYDROSTATIC PRESSURE TESTING

- A. After flushing, and the installation of valves the following tests shall be conducted in the sequence listed below. The Contractor shall furnish all equipment; materials and labor necessary to perform the tests and all tests shall be conducted in the presence of the Owner's Representative.
- B. Water pressure tests shall be performed on all pressure main lines before any couplings, fittings, valves and the like are concealed.
- C. Immediately prior to testing, all irrigation lines shall be purged of all entrapped air or debris by adjusting control valves and installing temporary caps forcing water and debris to be discharged from a single outlet.
- D. Test all pressure main line at 150 PSI. For a minimum of four (4) hours with an allowable loss of 5 PSI. Pressure and gauges shall be read in PSI, and calibrated such that accurate determination of potential pressure loss can be ascertained.
- E. Re-test as required until the system meets the requirements. Any leaks, which occur during test period, will be repaired immediately following the test. All pipe shall be re-tested until final written acceptance.
- F. The Contractor is responsible for proving documentation stating the weather conditions, date, the start time and initial water pressure readings, the finish time and final water pressure readings and the type of equipment used to perform the test. The documentation must be signed by a witness acceptable to the Owner, verifying all of the above-mentioned conditions.
- G. Submit a written report of the pressure testing results with the other above required information to the Owner's Representative for approval.

3.7 BACKFLOW PREVENTER TESTING

- A. The backflow preventer shall be tested according to procedures and results per the requirements of the Foundation for Cross-Connection Control and Hydraulic Research, University of Southern California or American Water Works Association whichever is more stringent.

3.8 BACKFILLING AND COMPACTING

- A. Irrigation trenches shall be carefully backfilled with material approved for backfilling and free of rocks and debris one (1) inch in diameter and larger. When back filling trenches in areas of imported or modified planting soil, replace any excavated subsoil at the bottom and the imported soil or modified planting soil at the top of the trench.
- B. Backfill shall be compacted with approved equipment to the following densities
Backfill under pavement and within 2 feet of the edge of pavement: Compact to 95% or greater of maximum dry density standard proctor.
Backfill of subsoil under imported planting mixes or modified existing planting soil: Between 85 and 90% of maximum dry density standard proctor.
Backfill of imported planting mixes or modified existing planting soil: Compact to the requirements of the adjacent planting mix or planting soil as specified in section "Planting Soil".
- C. Finish grade of all trenches shall conform to adjacent grades without dips or other irregularities. Dispose of excess soil or debris off site at Contractor's expense.
- D. Any settling of backfill material during the maintenance or warranty period shall be repaired at the Contractor's expense, including any replacement or repair of soil, lawn, and plant material or paving surface.

3.9 RESURFACING PAVING OVER TRENCHES

- A. Restore all surfaces and repair existing underground installations damaged or cut as a result of the excavation to their original condition, satisfactory to the Owner's Representative.
- B. Trenches through paved areas shall be resurfaced with same materials quality and thickness as existing material. Paving restoration shall be performed by the project paving Sub-contractor or an approved Contractor skilled in paving work.
- C. The cost of all paving restoration work shall be the responsibility of the irrigation Contractor unless the trenching thru the paving was, by previous agreement, part of the general project related construction.

3.10 INSTALLATION OF EQUIPMENT

- A. General:
All equipment shall be installed to meet all installation requirements of the product manufacturer. In the event that the manufactures requirements cannot be implemented due to particular condition at the site or with other parts of the design, obtain the Owner's Representative's written authorization and approval for any modifications.
Install all valves within a valve box of sufficient size to accommodate the installation and servicing of the equipment. Group valves together where practical and locate in shrub planting areas.
All sprinkler irrigation systems that are using water from potable water systems shall require backflow prevention. All backflow prevention devices shall meet and be installed in accordance with requirements set forth by local codes and the health department.
- B. Pressure regulator:

Set regulator for required PSI per manufacturer's specifications.

- C. Check Valve:
Install check valves approximately at the locations necessary to prevent low head run off.
- D. Remote control valves:
Install one remote control valve per valve box.
Remote control valve manifolds and quick coupler valves shall be separate allowing use of a quick coupler with all remote control valves shut off.
Install boxes no farther than 12 inches from edge of paving and perpendicular to edge of paving and parallel to each other. Allow 12 inches clearance between adjacent valve boxes.
- E. Quick coupler valve:
Install each quick coupler valve in its own valve box.
Install thrust blocks on quick couplers.
Place no closer than 12 inches to adjacent paving.
Install 18 inches off set from main line.
- F. Sprinkler heads:
All main lines and lateral lines, including risers, shall be flushed and pressure tested before installing sprinkler heads.
Sprinkler shall be installed and laid out to achieve for full coverage, spacing of heads shall not exceed the maximum spacing recommended by the manufacturer.
All sprinkler heads shall be set perpendicular to finish.
- G. Irrigation controllers:
Remote control valves shall be connected to controller in numerical sequence as shown on the drawings.
Controller shall be tested with complete electrical connections. The Contractor shall be responsible for temporary power to the controller for operation and testing purposes.
Connections to control wiring shall be made within the pedestal of the controller.
All wire shall follow the pressure main insofar as possible.
Electrical wiring shall be in a rigid gray PVC plastic conduit from controller to electrical outlet. The electrical Contractor shall be responsible for installing all wiring to the controller, in order to complete this installation.
A disconnect switch shall be included.
- H. Wiring:

Low Voltage
 - a. Control wiring between controller and electrical valves shall be installed in the same trench as the main line where practical. The wire shall be bundled and secured to the lower quadrant of the trench at 10 foot intervals with plastic electrical tape.
 - b. When the control wiring cannot be installed in the same main line trench it shall be installed a minimum of 18 inches below finish grade and a bright colored plastic ribbon with suitable markings shall be installed in the trench 6 inches below grade directly over the wire.
 - c. An expansion loop shall be provided every 500 feet in a box and

inside each valve box. Expansion loop shall be formed by wrapping wire at least eight (8) times around a ¾ inch pipe and withdrawing pipe.

- d. Provide one control wire to service each valve in system.
- e. Run two (2) spare #14-1 wires from controller along entire main line to last electric remote control valve on each and every leg of main line. Label spare wires at controller and wire stub to be located in a box.
- f. All control wire splices not occurring at control valve shall be installed in a separate splice valve box.
- g. Wire markers (sealed, 1 inch to 3 inch square) are to identify control wires at valves and at terminal strips of controller. At the terminal strip mark each wire clearly indicating valve circuit number.

High Voltage

- h. All electrical work shall conform to local codes, ordinances and any authorities having jurisdiction. All high voltage electrical work to be performed by licensed electrician.
- i. The Contractor shall provide 120-volt power connection to the automatic controller unless noted otherwise on drawings.

I. Valve boxes:

Install one valve box for each type of valve installed.

Gravel sump shall be installed after compaction of all trenches. Final portion of gravel shall be placed inside valve box after valve is backfilled and compacted.

Permanently label valve number and or controller letter on top of valve box lid using a method approved by the Owners Representative.

J. Tracer wire:

Tracer wire shall be installed with non-metallic plastic irrigation main lines where controller wires are not buried in the same trench as the main line.

The tracer wire shall be placed on the bottom of the trench under the vertical projection of the pipe with spliced joints soldered and covered with insulation type tape.

Tracer wire shall be of a color not used for valve wiring. Terminate wire in a valve box. Provide enough length of wire to make a loop and attach wire marker with the designation "tracer wire".

K. Drip Installation:

Clamp fittings with Oetiker clamps or approved equal when operating pressure exceeds specific drip tubing fitting requirements.

When installing drip tubing, install soil staples as listed below:

- a. Sandy Soil - One staple every three (3') feet and two (2) staples on each change of direction (tee, elbow, or cross).
- b. Loam Soil - One staple every four (4') feet and two (2) staples on each change of direction (tee, elbow, or cross).
- c. Clay Soil - One staple every five (5') feet and two (2) staples on each change of direction (tee, elbow, or cross).

Cap or plug all openings as soon as lines have been installed to prevent the intrusion of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation.

Thoroughly flush all water lines before installing valves and other hydrants.

3.11 ADJUSTMENT AND COVERAGE TEST

- A. Adjustment:
The Contractor shall flush and adjust all sprinkler heads, valves and all other equipment to ascertain that they function according to the manufacturer's data.
Adjust all sprinkler heads not to overspray onto walks, roadways and buildings when under maximum operating pressure and during times of normal prevailing winds.
- B. Coverage test:
The Contractor shall perform the coverage test in the presence of the Owner's Representative after all sprinkler heads have been installed, flushed and adjusted. Each section is tested to demonstrate uniform and adequate coverage of the planting areas serviced.
Any systems that require adjustments for full and even coverage shall be done by the Contractor prior to final acceptance at the direction of the Owner's Representative at no additional cost. Adjustments may also include realignment of pipes, addition of extra heads, and changes in nozzle type or size.
The Contractor at no additional cost shall immediately correct all unauthorized changes or improper installation practices.
The entire irrigation system shall be operating properly with written approval of the installation by the Owner's representative prior to beginning any planting operations.

3.12 REPAIR OF PLANTING SOIL

- A. Any areas of planting soil including imported or existing soils or modified planting soil which become compacted or disturbed or degraded as a result of the installation of the irrigation system shall be restored to the specified quality and compaction prior to beginning planting operations at no additional expense to the Owner. Restoration methods and depth of compaction remediation shall be approved by the Owner's Representative.

3.13 CLEAN-UP

- A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on public right of ways and neighboring property.
- B. Once installation is complete, wash all soil from pavements and other structures. Make all repairs to grades ruts, and damage to the work or other work at the site. Remove and dispose of all excess soil, packaging, and other material brought to the site by the Contractor.

3.14 PROTECTION

- A. The Contractor shall protect installed irrigation work from damage due to operations by other Contractors or trespassers.
Maintain protection during installation until Acceptance. Treat, repair or replace damaged work immediately. The Owner's Representative shall determine when such treatment, replacement or repair is satisfactory.

3.15 PRE-MAINTENANCE OBSERVATION:

- A. Once the entire system shall be completely installed and operational and all planting is installed, the Owner's Representative shall observe the system and prepare a written punch list indicating all items to be corrected and the beginning date of the maintenance period.
- B. This is not final acceptance and does not relieve the Contractor from any of the responsibilities in the contract documents.

3.16 GENERAL MAINTENANCE AND THE MAINTENANCE PERIOD

- A. General maintenance shall begin immediately after installation of irrigation system. The general maintenance and the maintenance period shall include the following:
 - On a bi-weekly basis the Contractor shall keep the irrigation system in good running order and make observations on the entire system for proper operation and coverage. Repair and cleaning shall be done to keep the system in full operation.
 - Records of all timing changes to control valves from initial installation to time of final acceptance shall be kept and turned over to the Owner's Representative at the time of final acceptance.
 - During the last week of the maintenance period, provide equipment familiarization and instruction on the total operations of the system to the personnel who will assume responsibility for running the irrigation system.
 - At the end of the maintenance period, turn over all operations logs, manuals, instructions, schedules, keys and any other equipment necessary for operation of the irrigation system to the Owner's Representative who will assume responsibility for the operations and maintenance of the irrigation system.
- B. The maintenance period for the irrigation system shall coincide with the maintenance period for the Planting. (See specification section "Planting")

3.17 SUBSTANTIAL COMPLETION ACCEPTANCE

- A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the work is substantially complete.
- B. The date of substantial completion of the irrigation shall be the date when the Owner's Representative accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.

3.18 FINAL ACCEPTANCE / SYSTEM MALFUNCTION CORRECTIONS

- A. At the end of the Plant Warranty and Maintenance period, (See specification section "Planting") the Owner's Representative shall inspect the irrigation work and establish that all provisions of the irrigation system are complete and the system is working correctly.
 - Restore any soil settlement over trenches and other parts of the irrigation system.
 - Replace, repair or reset any malfunctioning parts of the irrigation system.
- B. The Contractor shall show all corrections made from punch list. Any items deemed not acceptable shall be reworked and the maintenance period will be

extended.

- C. The Contractor shall show evidence that the Owner's Representative has received all charts, records, drawings, and extra equipment as required before final acceptance.
- D. Failure to pass review: If the work fails to pass final review, any subsequent observations must be rescheduled as per above. The cost to the Owner for additional observations will be charged to the Contractor at the prevailing hourly rate of the reviewer.

END OF SECTION

SECTION 329000

PLANTING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Retain or delete this article in all Sections of Project Manual. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. The scope of work includes all labor, materials, tools, supplies, equipment, facilities, transportation and services necessary for, and incidental to performing all operations in connection with furnishing, delivery, and installation of Planting Soil and /or the modification of existing site soil for use as Planting Soil and plant (also known as "landscaping") complete as shown on the drawings and as specified herein.
- B. The scope of work in this section includes, but is not limited to, the following:
 - 1. Locate, purchase, deliver and install Imported Planting Soil, soil amendments and plants.
 - 2. Harvest and stockpile existing site soils suitable for Planting Soil.
 - 3. Modify existing stockpiled site soil.
 - a. Modify existing site soil in place for use as Planting Soil.
 - b. Install existing or modified existing soil for use as Planting Soil.
 - 4. Fine grade Planting Soil.
 - 5. Install Compost into Planting Soil.
 - 6. Clean up and disposal of all excess and surplus material.
 - 7. Water all specified plants.
 - 8. Mulch, fertilize, stake, and prune all specified plants.
 - 9. Maintenance of all specified plants until the beginning of the warranty period.
 - 10. Plant warranty.
 - 11. Clean up and disposal of all excess and surplus material.
 - 12. Maintenance of all specified plants during the warranty period.

1.3 CONTRACT DOCUMENTS

- A. Shall consist of specifications, general conditions, and the drawings. The intent of these documents is to include all labor, materials, and services necessary for the proper execution of the work. The documents are to be considered as one. Whatever is called for by any parts shall be as binding as if called for in all parts.

1.4 REFERENCES

- A. References: The following specifications and standards of the organizations and documents listed in this paragraph form a part of the Specification to the extent required by the references thereto. In the event that the requirements of the following referenced standards and specification conflict with this specification section the requirements of this specification shall prevail. In the event that the

requirements of any of the following referenced standards and specifications conflict with each other the more stringent requirement shall prevail.

1. ASTM: American Society of Testing Materials cited section numbers.
2. U.S. Department of Agriculture, Natural Resources Conservation Service, 2003. National Soil Survey Handbook, title 430-VI. Available Online.
3. US Composting Council www.compostingcouncil.org and http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf.
4. *Methods of Soil Analysis*, as published by the Soil Science Society of America (<http://www.soils.org/>).
5. Up by Roots: healthy soils and trees in the built environment. 2008. J. Urban. International Society of Arboriculture, Champaign, IL.
6. ANSI Z60.1 American Standard for Nursery Stock, most current edition.
7. ANSI A 300 – Standard Practices for Tree, Shrub and other Woody Plant Maintenance, most current edition and parts.
8. Interpretation of plant names and descriptions shall reference the following documents. Where the names or plant descriptions disagree between the several documents, the most current document shall prevail.
9. USDA - The Germplasm Resources Information Network ([GRIN](http://www.ars-grin.gov/npgs/searchgrin.html)) <http://www.ars-grin.gov/npgs/searchgrin.html>
10. Manual of Woody Landscape Plants; Michael Dirr; Stipes Publishing, Champaign, Illinois; Most Current Edition.
11. The New Sunset Western Garden Book, Oxmoor House, most current edition.
12. Pruning practices shall conform to recommendations “Structural Pruning: A Guide For The Green Industry” most current edition; published by Urban Tree Foundation, Visalia, California.
13. Glossary of Arboricultural Terms, International Society of Arboriculture, Champaign IL, most current edition.

1.5 VERIFICATION

- A. All scaled dimensions on the drawings are approximate. Before proceeding with any work, the Contractor shall carefully check and verify all dimensions and quantities, and shall immediately inform the Owner's Representative of any discrepancies between the information on the drawings and the actual conditions, refraining from doing any work in said areas until given approval to do so by the Owner's Representative.
- B. In the case of a discrepancy in the plant quantities between the plan drawings and the plant call outs, list or plant schedule, the number of plants or square footage of the planting bed actually drawn on the plan drawings shall be deemed correct and prevail.

1.6 PERMITS AND REGULATIONS

- A. The Contractor shall obtain and pay for all permits related to this section of the work unless previously excluded under provision of the contract or general conditions. The Contractor shall comply with all laws and ordinances bearing on the operation or conduct of the work as drawn and specified. If the Contractor observes that a conflict exists between permit requirements and the work outlined in the contract documents, the Contractor shall promptly notify the

Owner's Representative in writing including a description of any necessary changes and changes to the contract price resulting from changes in the work.

- B. Wherever references are made to standards or codes in accordance with which work is to be performed or tested, the edition or revision of the standards and codes current on the effective date of this contract shall apply, unless otherwise expressly set forth.
- C. In case of conflict among any referenced standards or codes or among any referenced standards and codes and the specifications, the more restrictive standard shall apply or Owner's Representative shall determine which shall govern.
- D. Planting shall comply with the requirements in the Oregon City Municipal Code, Chapters 17.62.050.A.1 and 17.62.052.060.

1.7 PROTECTION OF WORK, PROPERTY AND PERSON

- A. The Contractor shall adequately protect the work, adjacent property, and the public, and shall be responsible for any damages or injury due to the Contractor's actions.

1.8 CHANGES IN WORK

- A. The Owner's Representative may order changes in the work, and the contract sum adjusted accordingly. All such orders and adjustments plus claims by the Contractor for extra compensation must be made and approved in writing before executing the work involved.
- B. All changes in the work, notifications and contractor's request for information (RFI) shall conform to the contract general condition requirements.

1.9 CORRECTION OF WORK

- A. The Contractor shall re-execute any work that fails to conform to the requirements of the contract and shall remedy defects due to faulty materials or workmanship upon written notice from the Owner's Representative, at the soonest possible time that can be coordinated with other work and seasonal weather demands but not more than 180 (one hundred and eighty) days after notification.

1.10 DEFINITIONS

- A. Planting Soil
 - 1. Acceptable drainage: Drainage rate is sufficient for the plants to be grown. Not too fast and not too slow. Typical rates for installed Planting Soil are between 1 - 5 inches per hour. Turf soils are often higher, but drainage rates above 2 - 3 inches per hour will dry out very fast. In natural undisturbed soil a much lower drainage rate, as low as 1/8th inch per hour can still support good plant growth. Wetland plants can grow on top of perched water layers or even within seasonal perched water layers, but could become unstable in high wind events.
 - 2. Amendment: material added to Topsoil to produce Planting Soil Mix. Amendments are classified as general soil amendments, fertilizers,

- biological, and pH amendments.
3. Biological Amendment: Amendments such as Mycorrhizal additives, compost tea or other products intended to change the soil biology.
 4. Compacted soil: soil where the density of the soil is greater than the threshold for root limiting, and further defined in this specification.
 5. Compost: well decomposed stable organic material as defined by the US Composting Council and further defined in this specification.
 6. Drainage: The rate at which soil water moves through the soil transitioning the soil from saturated condition to field capacity. Most often expressed as saturated hydraulic conductivity (Ksat; units are inches per hour).
 7. End of Warranty Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of the warranty. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation (if applicable) work run concurrent with each other, and further defined in this specification.
 8. Existing Soil: Mineral soil existing at the locations of proposed planting after the majority of the construction within and around the planting site is completed and just prior to the start of work to prepare the planting area for soil modification and/or planting, and further defined in this specification.
 9. Fertilizer: amendment used for the purpose of adjusting soil nutrient composition and balance.
 10. Fine grading: The final grading of the soil to achieve exact contours and positive drainage, often accomplished by hand rakes or drag rakes or other suitable devices, and further defined in this specification, and further defined in this specification.
 11. Finished grade: surface or elevation of Planting Soil after final grading and 12 months of settlement of the soil, and further defined in this specification.
 12. Graded soil: Soil where the A horizon has been stripped and relocated or re-spread; cuts and fills deeper than 12 inches, and further defined in this specification.
 13. Installed soil: Planting soil and existing site soil that is spread and or graded to form a planting soil, and further defined in this specification.
 14. Minor disturbance: Minor grading as part of agricultural work that only adjusts the A horizon soil, minor surface compaction in the top 6 inches of the soil, applications of fertilizers, installation of utility pipes smaller than 18 inches in diameter thru the soil zone.
 15. Owner's Representative: The person or entity, appointed by the Owner to represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.
 16. Ped: a clump or clod of soil held together by a combination of clay, organic matter, and fungal hyphae, retaining the original structure of the harvested soil.
 17. Planting Soil: Topsoil, or Planting Soil Mixes which are imported or existing at the site, or made from components that exist at the site, or are imported to the site; and further defined in this specification.
 18. Poor drainage: Soil drainage that is slower than that to which the plants can adapt. This is a wide range of metrics, but generally if the soil is turning grey in color it is reasonable preferable to either to plant moisture

- adaptive plants at smaller sizes that are young in age with shallow root balls or look at options to improve the drainage
19. Scarify: Loosening and roughening the surface of soil and sub soil prior to adding additional soil on top, and further defined in this specification.
 20. Soil Fracturing: Deep loosening the soil to the depths specified by using a back hoe, and further defined in this specification.
 21. Soil Horizons: as defined in the USDA National Soil Survey Handbook
 22. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242.
 23. Soil Tilling: Loosening the surface of the soil to the depths specified with a rotary tine tilling machine, roto tiller, (or spade tiller), and further defined in this specification.
 24. Soil trenching: Cutting narrow trenches thru the soil at the depths and spacing specified to loosen the soil profile, and further defined in this specification.
 25. Subgrade: surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing Planting Soil.
 26. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation (if applicable) where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun. This date may be different than the date of substantial completion for the other sections of the project, and further defined in this specification.

B. Planting

1. Topsoil: naturally produced and harvested soil from the A horizon or upper layers or the soil as further defined in this specification.
2. Undisturbed soil: Soils with the original A horizon intact that have not been graded or compacted. Soils that have been farmed, subjected to fire or logged but not graded, and natural forested land will be considered as undisturbed.
3. Container plant: Plants that are grown in and/or are currently in a container including boxed trees.
4. Defective plant: Any plant that fails to meet the plant quality requirement of this specification.
5. End of Warranty Final Acceptance: The date when the Owner's Representative accepts that the plants and work in this section meet all the requirements of the warranty. It is intended that the materials and workmanship warranty for Planting, Planting Soil, and Irrigation work run concurrent with each other.
6. Field grown trees (B&B): Trees growing in field soil for at least 12 months prior to harvest.
7. Healthy: Plants that are growing in a condition that expresses leaf size, crown density, color; and with annual growth rates typical of the species and cultivar's horticultural description, adjusted for the planting site soil, drainage and weather conditions.
8. Kinked root: A root within the root package that bends more than 90 degrees.
9. Maintenance: Actions that preserve the health of plants after installation and as defined in this specification.
10. Maintenance period: The time period, as defined in this specification, which the Contractor is to provide maintenance.
11. Normal: the prevailing protocol of industry standard(s).
12. Owner's Representative: The person appointed by the Owner to

represent their interest in the review and approval of the work and to serve as the contracting authority with the Contractor. The Owner's Representative may appoint other persons to review and approve any aspects of the work.

13. Reasonable and reasonably: When used in this specification relative to plant quality, it is intended to mean that the conditions cited will not affect the establishment or long term stability, health or growth of the plant. This specification recognizes that it is not possible to produce plants free of all defects, but that some accepted industry protocols and standards result in plants unacceptable to this project. When reasonable or reasonably is used in relation to other issues such as weeds, diseased, insects, it shall mean at levels low enough that no treatment would be required when applying recognized Integrated Plant Management practices. This specification recognizes that some decisions cannot be totally based on measured findings and that professional judgment is required. In cases of differing opinion, the Owner's Representative's expert shall determine when conditions are judged as reasonable.
14. Root ball: The mass of roots including any soil or substrate that is shipped with the tree within the root ball package.
15. Root ball package: The material that surrounds the root ball during shipping. The root package may include the material in which the plant was grown, or new packaging placed around the root ball for shipping.
16. Root collar (root crown, root flare, trunk flare, flare): The region at the base of the trunk where the majority of the structural roots join the plant stem, usually at or near ground level.
17. Shrub: Woody plants with mature height approximately less than 15 feet.
18. Spade harvested and transplanted: Field grown trees that are mechanically harvested and immediately transplanted to the final growing site without being removed from the digging machine.
19. Stem: The trunk of the tree.
20. Substantial Completion Acceptance: The date at the end of the Planting, Planting Soil, and Irrigation installation where the Owner's Representative accepts that all work in these sections is complete and the Warranty period has begun. This date may be different than the date of substantial completion for the other sections of the project.
21. Stem girdling root: Any root more than ¼ inch diameter currently touching the trunk, or with the potential to touch the trunk, above the root collar approximately tangent to the trunk circumference or circling the trunk. Roots shall be considered as Stem Girdling that have, or are likely to have in the future, root to trunk bark contact.
22. Structural root: One of the largest roots emerging from the root collar.
23. Tree: Single and multi-stemmed plants with mature height approximately greater than 15 feet.

1.11 OBSERVATION OF THE WORK

- A. The Owner's Representative may observe the work at any time. They may remove samples of materials for conformity to specifications. Rejected materials shall be immediately removed from the site and replaced at the Contractor's expense. The cost of testing materials not meeting specifications shall be paid by the Contractor.
 1. The Owner's Representative may utilize the Contractor's penetrometer and moisture meter at any time to check soil compaction and moisture.

- B. The Owner's Representative shall be informed of the progress of the work so the work may be observed at the following key times in the construction process. The Owner's Representative shall be afforded sufficient time to schedule visit to the site. Failure of the Owner's Representative to make field observations shall not relieve the Contractor from meeting all the requirements of this specification.
1. EXISTING SOIL CONDITIONS REVIEW: Prior to the start of any soil modification that will utilize or modify the existing soil.
 2. EXCAVATION REVIEW: Observe each area of excavation prior to the installation of any Planting Soil.
 3. COMPLETION of SOIL MODIFICATIONS REVIEW: Upon completion of all soil modification and installation of planting soil.
 4. COMPLETION OF FINE GRADING AND SURFACE SOIL MODIFICATIONS REVIEW: Upon completion of all surface soil modifications and fine grading but prior to the installation of shrubs, ground covers, or lawns.
 5. SITE CONDITIONS PRIOR TO THE START OF PLANTING: review the soil and drainage conditions.
 6. COMPLETION OF THE PLANT LAYOUT STAKING: Review of the plant layout.
 7. PLANT QUALITY: Review of plant quality at the time of delivery and prior to installation. Review tree quality prior to unloading where possible, but in all cases prior to planting.
 8. COMPLETION OF THE PLANTING: Review the completed planting.

1.12 PRE-CONSTRUCTION CONFERENCE

- A. Schedule a pre-construction meeting with the Owner's Representative at least seven (7) days before beginning work to review any questions the Contractor may have regarding the work, administrative procedures during construction and project work schedule.

1.13 QUALITY ASSURANCE

- A. Installer Qualifications: The installer shall be a firm having at least 5 years of experience of a scope similar to that required for the work, including the preparation, mixing and installation of soil mixes to support planting. The installer of the work in Section: Planting, shall be the same firm installing the work in this section.
1. The bidders list for work under this section shall be approved by the Owner's Representative.
 2. Installer Field Supervision: When any Planting Soil work is in progress, installer shall maintain, on site, an experienced full-time supervisor who can communicate in English with the Owner's Representative.
 3. Installer's field supervisor shall have a minimum of five years experience as a field supervisor installing soil, shall be trained and proficient in the use of field surveying equipment to establish grades and can communicate in English with the Owner's Representative.
 4. The installer's crew shall be experienced in the installation of Planting Soil, plantings, and irrigation (where applicable) and interpretation of planting plans, soil installation plans, and irrigation plans (where applicable).
 5. Submit references of past projects and employee training certifications that support that the Contractors meet all of the above installer qualifications and applicable licensures.

- B. Soil compaction testing: following installation or modification of soil, test soil compaction with a penetrometer.
- C. Substantial Completion Acceptance - Acceptance of the work prior to the start of the warranty period:
 - 1. Once the Contractor completes the installation of all items in this section, the Owner's Representative will observe all work for Substantial Completion Acceptance upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date of the observation.
 - 2. Substantial Completion Acceptance by the Owner's Representative shall be for general conformance to specified size, character and quality and not relieve the Contractor of responsibility for full conformance to the contract documents, including correct species.
 - 3. Any plants that are deemed defective as defined under the provisions below shall not be accepted.
- D. The Owner's Representative will provide the Contractor with written acknowledgment of the date of Substantial Completion Acceptance and the beginning of the warranty period and plant maintenance period (if plant maintenance is included).
- E. Contractor's Quality Assurance Responsibilities: The Contractor is solely responsible for quality control of the work.
- F. Installer Qualifications: The installer shall be a firm having at least 5 years of successful experience of a scope similar to that required for the work, including the handling and planting of large specimen trees in urban areas. The same firm shall install planting soil (where applicable) and plant material.
 - 1. The bidders list for work under this section shall be approved by the Owner's Representative.
 - 2. Installer Field Supervision: When any planting work is in progress, installer shall maintain, on site, a full-time supervisor who can communicate in English with the Owner's Representative.
 - 3. Installer's field supervisor shall have a minimum of five years experience as a field supervisor installing plants and trees of the quality and scale of the proposed project, and can communicate in English with the Owner's Representative.
 - 4. The installer's crew shall have a minimum of 3 years experienced in the installation of Planting Soil, Plantings, and Irrigation (where applicable) and interpretation of soil plans, planting plans and irrigation plans.
 - 5. Submit references of past projects, employee training certifications that support that the Contractors meets all of the above installer qualifications and applicable licensures.

1.14 PLANT WARRANTY

- A. Plant Warranty:
 - 1. The Contractor agrees to replace defective work and defective plants. The Owner's Representative shall make the final determination if plants meet these specifications or that plants are defective.

Plants warranty shall begin on the date of Substantial Completion Acceptance and continue for the following periods, classed by plant type:
 - a. Trees – 2 Year(s).

- b. Shrubs – 1 Year(s).
 - c. Ground cover and perennial flower plants – 1 Year(s).
 - d. Bulbs, annual flower and seasonal color plants – for the period of expected bloom or primary display.
 - 2. When the work is accepted in parts, the warranty periods shall extend from each of the partial Substantial Completion Acceptances to the terminal date of the last warranty period. Thus, all warranty periods for each class of plant warranty, shall terminate at one time.
 - 3. All plants shall be warrantied to meet all the requirements for plant quality at installation in this specification. Defective plants shall be defined as plants not meeting these requirements. The Owner's representative shall make the final determination that plants are defective.
 - 4. Plants determined to be defective shall be removed immediately upon notification by the Owner's Representative and replaced without cost to the Owner, as soon as weather conditions permit and within the specified planting period.
 - 5. Any work required by this specification or the Owner's Representative during the progress of the work, to correct plant defects including the removal of roots or branches, or planting plants that have been bare rooted during installation to observe for or correct root defects shall not be considered as grounds to void any conditions of the warranty. In the event that the Contractor decides that such remediation work may compromise the future health of the plant, the plant or plants in question shall be rejected and replaced with plants that do not contain defects that require remediation or correction.
 - 6. The Contractor is exempt from replacing plants, after Substantial Completion Acceptance and during the warranty period, that are removed by others, lost or damaged due to occupancy of project, lost or damaged by a third party, vandalism, or any natural disaster.
 - 7. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in this specification. Make all necessary repairs due to plant replacements. Such repairs shall be done at no extra cost to the Owner.
 - 8. The warranty of all replacement plants shall extend for an additional one-year period from the date of their acceptance after replacement. In the event that a replacement plant is not acceptable during or at the end of the said extended warranty period, the Owner's Representative may elect one more replacement items or credit for each item. These tertiary replacement items are not protected under a warranty period.
 - 9. During and by the end of the warranty period, remove all tree wrap, ties, and guying unless agreed to by the Owner's Representative to remain in place. All trees that do not have sufficient caliper to remain upright, or those requiring additional anchorage in windy locations, shall be staked or remain staked, if required by the Owner's Representative.
- B. End of Warranty Final Acceptance - Acceptance of plants at the end of the warranty period.
- 1. At the end of the warranty period, the Owner's Representative shall observe all warranted work, upon written request of the Contractor. The request shall be received at least ten calendar days before the anticipated date for final observation.
 - 2. End of Warranty Final Acceptance will be given only when all the requirements of the work under this specification and in specification

sections Planting Soil and Irrigation have been met.

1.15 SELECTION AND OBSERVATION OF PLANTS

- A. The Owner's Representative may review all plants subject to approval of size, health, quality, character, etc. Review or approval of any plant during the process of selection, delivery, installation and establishment period shall not prevent that plant from later rejection in the event that the plant quality changes or previously existing defects become apparent that were not observed.
- B. Plant Selection: The Owner's Representative reserves the right to select and observe all plants at the nursery prior to delivery and to reject plants that do not meet specifications as set forth in this specification. If a particular defect or substandard element can be corrected at the nursery, as determined by the Owner's Representative, the agreed upon remedy may be applied by the nursery or the Contractor provided that the correction allows the plant to meet the requirements set forth in this specification. Any work to correct plant defects shall be at the contractor's expense.
 - 1. The Owner's Representative may make invasive observation of the plant's root system in the area of the root collar and the top of the root ball in general in order to determine that the plant meets the quality requirements for depth of the root collar and presence of roots above the root collar. Such observations will not harm the plant.
 - 2. Corrections are to be undertaken at the nursery prior to shipping.
- C. The Contractor shall bear all cost related to plant corrections.
- D. All plants that are rejected shall be immediately removed from the site and acceptable replacement plants provided at no cost to the Owner.
- E. Trees shall be purchased from the growing nursery. Re-wholesale plant suppliers shall not be used as sources unless the Contractor can certify that the required trees are not directly available from a growing nursery. When Re-wholesale suppliers are utilized, the Contractor shall submit the name and location of the growing nursery from where the trees were obtained by the re-wholesale seller. The re-wholesale nursery shall be responsible for any required plant quality certifications.
- F. The Contractor shall require the grower or re-wholesale supplier to permit the Owner's Representative to observe the root system of all plants at the nursery or job site prior to planting including random removal of soil or substrate around the base of the plant. Observation may be as frequent and as extensive as needed to verify that the plants meet the requirements of the specifications and conform to requirements.

1.16 PLANT SUBSTITUTIONS FOR PLANTS NOT AVAILABLE

- A. Submit all requests for substitutions of plant species, or size to the Owner's Representative, for approval, prior to purchasing the proposed substitution. Request for substitution shall be accompanied with a list of nurseries contacted in the search for the required plant and a record of other attempts to locate the required material. Requests shall also include sources of plants found that may be of a smaller or larger size, or a different shape or habit than specified, or plants of the same genus and species but different cultivar origin, or which may otherwise not meet the requirements of the specifications, but which may be

available for substitution.

1.17 SITE CONDITIONS

- A. It is the responsibility of the Contractor to be aware of all surface and subsurface conditions, and to notify the Owner's Representative, in writing, of any circumstances that would negatively impact the health of plantings. Do not proceed with work until unsatisfactory conditions have been corrected.
 - 1. Should subsurface drainage or soil conditions be encountered which would be detrimental to growth or survival of plant material, the Contractor shall notify the Owner's Representative in writing, stating the conditions and submit a proposal covering cost of corrections. If the Contractor fails to notify the Owner's Representative of such conditions, they shall remain responsible for plant material under the warrantee clause of the specifications.
 - 2. This specification requires that all Planting Soil and Irrigation (if applicable) work be completed and accepted prior to the installation of any plants.
- B. It is the responsibility of the Contractor to be familiar with the local growing conditions, and if any specified plants will be in conflict with these conditions. Report any potential conflicts, in writing, to the Owner's Representative.
- C. This specification requires that all Planting Soil and Irrigation (if applicable) work be completed and accepted prior to the installation of any plants.
 - 1. Planting operations shall not begin until such time that the irrigation system is completely operational for the area(s) to be planted, and the irrigation system for that area has been preliminarily observed and approved by the Owner's Representative.
- D. Actual planting shall be performed during those periods when weather and soil conditions are suitable in accordance with locally accepted horticultural practices.
 - 1. Do not install plants into saturated or frozen soils. Do not install plants during inclement weather, such as rain or snow or during extremely hot, cold or windy conditions.

1.18 SOIL COMPACTION – GENERAL REQUIREMENTS

- A. Except where more stringent requirements are defined in this specification. The following parameters shall define the general description of the threshold points of soil compaction in existing, modified or installed soil and subsoil.
- B. The following are threshold levels of compaction as determined by each method.
 - 1. Acceptable Compaction: Good rooting anticipated, but increasing settlement expected as compaction is reduced and/or in soil with a high organic matter content.
 - a. Bulk Density Method – Varies by soil type see Chart on page 32 in Up By Roots.
 - b. Standard Proctor Method – 75-85%; soil below 75% is unstable and will settle excessively.
 - c. Penetration Resistance Method – about 75-250 psi, below 75 psi soil becomes increasingly unstable and will settle excessively.
 - 2. Root limiting Compaction: Root growth is limited with fewer, shorter and slower growing roots.

- a. Bulk Density Method – Varies by soil type see Chart on page 32 in Up By Roots.
 - b. Standard Proctor Method – above approximately 85%.
 - c. Penetration Resistance Method – about 300 psi.
- 3. Excessive Compaction: Roots not likely to grow but can penetrate soil when soil is above field capacity.
 - a. Bulk Density Method – Varies by soil type see Chart on page 32 in Up By Roots.
 - b. Standard Proctor Method – Above 90%.
 - c. Penetration Resistance Method – Approximately above 400 psi

1.19 DELIVERY, STORAGE, AND HANDLING

- A. Weather: Do not mix, deliver, place or grade soils when frozen or with moisture above field capacity.
- B. Protect soil and soil stockpiles, including the stockpiles at the soil blender's yard, from wind, rain and washing that can erode soil or separate fines and coarse material, and contamination by chemicals, dust and debris that may be detrimental to plants or soil drainage. Cover stockpiles with plastic sheeting or fabric at the end of each workday.
- C. All manufactured packaged products and material shall be delivered to the site in unopened containers and stored in a dry enclosed space suitable for the material and meeting all environmental regulations. Biological additives shall be protected from extreme cold and heat. All products shall be freshly manufactured and dated for the year in which the products are to be used.
- D. Deliver all chemical amendments in original, unopened containers with original labels intact and legible, which state the guaranteed chemical analysis. Store all chemicals in a weather protected enclosure.
- E. Bulk material: Coordinate delivery and storage with Owner's Representative and confine materials to neat piles in areas acceptable to Owner's Representative.
- F. Protect materials from deterioration during delivery and storage. Adequately protect plants from drying out, exposure of roots to sun, wind or extremes of heat and cold temperatures. If planting is delayed more than 24 hours after delivery, set plants in a location protected from sun and wind. Provide adequate water to the root ball package during the shipping and storage period.
 - 1. All plant materials must be available for observation prior to planting.
 - 2. Using a soil moisture meter, periodically check the soil moisture in the root balls of all plants to assure that the plants are being adequately watered. Volumetric soil moisture shall be maintained above wilting point and below field capacity for the root ball substrate or soil.
- G. Do not deliver more plants to the site than there is space with adequate storage conditions. Provide a suitable remote staging area for plants and other supplies.
 - 1. The Owner's Representative or Contractor shall approve the duration, method and location of storage of plants.
- H. Provide protective covering over all plants during transporting.

1.20 EXCAVATING, GRADING AND PLANTING AROUND UTILITIES

- A. Contractor shall carefully examine the civil, record, and survey drawings to become familiar with the existing underground conditions before digging.
- B. Determine location of underground utilities and perform work in a manner that will avoid damage. Hand excavate as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.
- C. Notification of the *Oregon Utility Notification Center*, (503) 232-1987, is required for all planting areas. The Contractor is responsible for knowing the location and avoiding utilities that are not covered by the *Oregon Utility Notification Center*.

PART 2 – PRODUCTS

2.1 IMPORTED TOPSOIL

- A. Imported Topsoil definition: Fertile, friable soil containing less than 5% total volume of the combination of subsoil, refuse, roots larger than 1 inch diameter, heavy, sticky or stiff clay, stones larger than 2 inches in diameter, noxious seeds, sticks, brush, litter, or any substances deleterious to plant growth. The percent (%) of the above objects shall be controlled by source selection not by screening the soil. Topsoil shall be suitable for the germination of seeds and the support of vegetative growth. Imported Topsoil shall not contain weed seeds in quantities that cause noticeable weed infestations in the final planting beds. Imported Topsoil shall meet the following physical and chemical criteria:
 - 1. Soil texture: USDA loam, sandy clay loam or sandy loam with clay content between 15 and 25%. And a combined clay/silt content of no more than 55%.
 - 2. pH value shall be between 5.5 and 7.0.
 - 3. Percent organic matter (OM): 2.0-5.0%, by dry weight.
 - 4. Soluble salt level: Less than 2 mmho/cm.
 - 5. Soil chemistry suitable for growing the plants specified.
- B. Imported Topsoil for Planting Soil shall NOT have been screened and shall retain soil peds or clods larger than 2 inches in diameter throughout the stockpile after harvesting.
- C. Stockpiled Existing Topsoil at the site meeting the above criteria may be acceptable.

2.2 COMPOST

- A. Compost: Blended and ground leaf, wood and other plant based material, composted for a minimum of 9 months and at temperatures sufficient to break down all woody fibers, seeds and leaf structures, free of toxic material at levels that are harmful to plants or humans. Source material shall be yard waste trimmings blended with other plant or manure based material designed to produce Compost high in fungal material.
 - 1. Compost shall be commercially prepared Compost and meet US Compost Council STA/TMECC criteria or as modified in this section for "Compost as a Landscape Backfill Mix Component".
 - 2. http://compostingcouncil.org/admin/wp-content/plugins/wp-pdfupload/pdf/191/LandscapeArch_Specs.pdf
 - 3. Compost shall comply with the following parameters:
 - a. pH: 5.5 - 8.0.

- b. Soil salt (electrical conductivity): maximum 5 dS/m (mmhos/cm).
- c. Moisture content %, wet weight basis: 30 – 60.
- d. Particle size, dry weight basis: 98% pass through 3/4 inch screen or smear.
- e. Stability carbon dioxide evolution rate: mg CO₂-C/ g OM/ day < 2.
- f. Solvita maturity test: > 6.
- g. Physical contaminants (inerts), %, dry weight basis: <1%.
- h. Chemical contaminants, mg/kg (ppm): meet or exceed US EPA Class A standard, 40CFR § 503.13, Tables 1 and 3 levels.
- i. Biological contaminants select pathogens fecal coliform bacteria, or salmonella, meet or exceed US EPA Class A standard, 40 CFR § 503.32(a) level requirements.

2.3 COARSE SAND

- A. Clean, washed, sand, free of toxic materials
 - 1. Coarse concrete sand, ASTM C-33 Fine Aggregate, with a Fines Modulus Index of 2.8 and 3.2.
 - 2. Coarse Sands shall be clean, sharp, natural Coarse Sands free of limestone, shale and slate particles. Manufactured Coarse Sand shall not be permitted.
 - 3. pH shall be lower than 7.0.
 - 4. Provide Coarse Sand with the following particle size distribution:

Sieve	Percent passing
3/8 inch (9.5 mm)	100
No 4 (4.75 mm)	95-100
No 8 (2.36 mm)	80-100
No 16 (1.18 mm)	50-85
No 30 (.60 mm)	25-60
No 50 (.30 mm)	10-30
No 100 (.15 mm)	2-10
No 200 (0.75 mm)	2-5

2.4 LIME

- A. ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:
 - 1. Class: Class T, with a minimum 99 percent passing through No. 8 (2.36-mm) sieve and a minimum 75 percent passing through No. 60 (0.25-mm) sieve.
 - 2. Provide lime in form of dolomitic limestone.

2.5 EXISTING SOIL (Acceptable for planting with minimum modifications)

- A. General definition of existing soil: Surface soil that is not altered, compacted to root limiting density, graded or contaminated before or during the construction process and considered acceptable for planting and long term health of the plants specified either as it exists or with only minor modification.
- B. Protect existing soil from compaction, contamination, and degradation during the construction process.
- C. Unless otherwise instructed, remove all existing plants, root thatch, and non-soil

debris from the surface of the soil using equipment that does not increase compaction of soil to root limiting levels.

- D. Modifications:
1. When results of soil tests recommend chemical adjustments, till surface soil to six inches or greater after chemical adjustments have been applied.
 2. Remove existing turf thatch, ground cover plants and weeds.
 3. Provide pre-emergent weed control if indicated.
 4. Make chemical adjustment as recommended by the soil test.

2.6 MODIFIED EXISTING SOIL (SOIL Suitable for planting with indicated modification).

- A. General definition: Surface soil that has been altered and or graded before or during the construction process but is still considered acceptable for planting and long term health of the plants specified with the proposed modifications. Modifications respond to the soil problems expected or encountered. The Owner's Representative shall verify that the soil in the designated areas is suitable for modification at the beginning of planting bed preparation work in that area.
1. The Owner's Representative shall verify that the soil in the designated areas is suitable for the specified modification at the beginning of planting bed preparation work in that area. In the event that the work of this project construction has damaged the existing soil in areas designated for modification to the point where the soil is no longer suitable to support the plants specified with the specified modification, the Owner's Representative may require further modification of the damaged soil up to an including removal and replacement with soil of equal quality to the soil that would have resulted from the modification. Damage may include further compaction, contamination, grading, creation of hard pan or drainage problem, and loss of the O, and or A horizon.
 2. General requirements for all soil modifications:
 - a. Take soil samples, test for chemical properties, and make appropriate adjustments.
 - b. Unless otherwise instructed, remove all existing plants, root thatch, and non-soil debris from the surface of the soil using equipment that does not add to the compaction in the soil.
 - c. All soil grading, tilling and loosening must be completed at times when the soil moisture is below field capacity. Allow soil to drain for at least two days after any rain event more than 1 inch in 24 hours, or long enough so that the soil does not make the hand muddy when squeezed.
 - d. Provide pre-emergent weed control after the soil work is complete and plants planted but prior to adding mulch to the surface, if indicated by weed type and degree of threat.

2.7 MODIFIED EXISTING SOIL – COMPACTED SURFACE SOIL (Tilling Option)

- A. Description of condition to be modified: Surface soil compaction to a maximum of 6 inches deep from traffic or light grading. Original A horizon may be previously removed or graded but lower profile intact with acceptable compaction levels and limited grading. The soil organic matter, pH and chemistry in the A horizon may

not be suitable for the proposed plants and may need to be modified as required.

B. Modifications:

1. Till top 6 inches or deeper of the soil surface, with a *roto tiller*, *spade tiller*, ripper or agricultural plow. Spread 2 - 3 inches of Compost on the surface of the tilled soil and make any chemical adjustment as recommended by the soil test.
2. Till or disk the Compost into the loosened soil. Smooth out grades with a drag rake or drag slip.

C. Modified existing soil – compacted subsoil

1. Description of condition to be modified: Deep soil compaction the result of previous grading, filling and dynamic or static compaction forces. Original A horizon likely removed or buried. The soil organic matter, pH and chemistry in the A horizon is likely not suitable for the proposed plants and should be modified as required.
2. Soil Fracturing:
 - a. Step one: After grading and removing all plants and debris from the surface, spread 2 – 3 inches of Compost over the surface of the soil. Loosen the soil to depth of 18 - 24 inches, using a backhoe to dig into the soil through the Compost. Lift and then drop the loosened soil immediately back into the hole. The bucket then moves to the adjacent soil and repeats the process until the entire area indicated has been loosened.
 - b. Step 2: Spread 3-4 inches of Compost over the ripped area and till into the top 6 inches of the soil surface.
3. Following soil fracturing the average penetration resistance should be less than 250 psi to the depth of the ripping or fracturing.
4. Do not start planting into ripped or fractured soil until soil has been settled or leave grades sufficiently high to anticipate settlement of 10 – 15% of ripped soil depth.

D. Modified existing soil – low organic matter

1. Description of condition to be modified: Low soil organic matter and/or missing A horizon but soil is not compacted except for some minor surface compaction. The soil organic matter, pH and/or chemistry are likely not suitable for the proposed plants and should be modified as required.
2. Modifications:
 - a. Spread 3 - 4 inches of Compost over the surface of the soil and make chemical adjustment as recommended by the soil test.
 - b. Till Compost into the top 6 inches of the soil.

2.8 PLANTING SOIL MIXES

- A. General definition: Mixes of Existing Soil or Imported Topsoil, Coarse Sand, and or Compost to make a new soil that meets the project goals for the indicated planting area. These may be mixed off site or onsite, and will vary in Mix components and proportions as indicated.
- B. Planting Mix - moderately slow draining soil for trees and shrub beds
1. A Mix of Imported Topsoil, Coarse Sand and Compost. The approximate Mix ratio shall be:

Mix component % by moist volume

Imported Topsoil unscreened 45-50%

Coarse sand 40-45%

Compost 10%

2. Final tested organic matter between 2.75 and 4% (by dry weight).
3. Mix the Coarse Sand and Compost together first and then add to the Topsoil. Mix with a loader bucket to loosely incorporate the Topsoil into the Coarse Sand/Compost Mix. DO NOT OVER MIX! Do not mix with a soil blending machine. Do not screen the soil. Clumps of Soil, Compost and Coarse Sand will be permitted in the overall Mix.
4. At the time of final grading, add fertilizer if required to the Planting Soil at rates recommended by the testing results for the plants to be grown.

2.9 PLANTS: GENERAL

- A. Standards and measurement: Provide plants of quantity, size, genus, species, and variety or cultivars as shown and scheduled in contract documents.
 1. All plants including the root ball dimensions or container size to trunk caliper ratio shall conform to ANSI Z60.1 "American Standard for Nursery Stock" latest edition, unless modified by provisions in this specification. When there is a conflict between this specification and ANSI Z60.1, this specification section shall be considered correct.
 2. Plants larger than specified may be used if acceptable to the Owner's Representative. Use of such plants shall not increase the contract price. If larger plants are accepted the root ball size shall be in accordance with ANSI Z-60.1. Larger plants may not be acceptable if the resulting root ball cannot be fit into the required planting space.
 3. If a range of size is given, no plant shall be less than the minimum size and not less than 50 percent of the plants shall be as large as the maximum size specified. The measurements specified are the minimum and maximum size acceptable and are the measurements after pruning, where pruning is required.
- B. Proper Identification: All trees shall be true to name as ordered or shown on planting plans and shall be labeled individually or in groups by genus, species, variety and cultivar.
- C. Compliance: All trees shall comply with federal and state laws and regulations requiring observation for plant disease, pests, and weeds. Observation certificates required by law shall accompany each shipment of plants.
- D. Plant Quality:
 1. **General:** Provide healthy stock, grown in a nursery and reasonably free of die-back, disease, insects, eggs, bores, and larvae. At the time of planting all plants shall have a root system, stem, and branch form that will not restrict normal growth, stability and health for the expected life of the plant
 2. Plant quality above the soil line:
 - a. Plants shall be healthy with the color, shape, size and distribution of trunk, stems, branches, buds and leaves normal to the plant type specified.
 - 1.) Crown: The form and density of the crown shall be typical for a young specimen of the species or cultivar pruned to a central and dominant leader.
 - a.) Crown specifications do not apply to plants that

have been specifically trained in the nursery as topiary, espalier, multi-stem, clump, or unique selections such as contorted or weeping cultivars.

- 2.) Leaves: The size, color, and appearance of leaves shall be typical for the time of year and stage of growth of the species or cultivar. Trees shall not show signs of prolonged moisture stress or over watering as indicated by wilted, shriveled, or dead leaves.
 - 3.) Branches: Shoot growth (length and diameter) throughout the crown should be appropriate for the age and size of the species or cultivar. Trees shall not have dead, diseased, broken, distorted, or otherwise injured branches.
 - 4.) Trunk: The tree trunk shall be relatively straight, vertical, and free of wounds that penetrate to the wood (properly made pruning cuts, closed or not, are acceptable and are not considered wounds), sunburned areas, conks (fungal fruiting bodies), wood cracks, sap leakage, signs of boring insects, galls, cankers, girdling ties, or lesions (mechanical injury).
 - 5.) Temporary branches, unless otherwise specified, can be present along the lower trunk below the lowest main (scaffold) branch, particularly for trees less than 1 inch in caliper. These branches should be no greater than 3/8-inch diameter. Clear trunk should be no more than 40% of the total height of the tree.
- b. Trees shall have one central leader. If the leader was headed, a new leader (with a live terminal bud) at least one-half the diameter of the pruning cut shall be present.
 - 1.) All trees are assumed to have one central leader trees unless a different form is specified in the plant list or drawings.
 - c. All graft unions, where applicable, shall be completely closed without visible sign of graft rejection. All grafts shall be visible above the soil line.
 - d. Trunk caliper and taper shall be sufficient so that the lower five feet of the trunk remains vertical without a stake. Auxiliary stake may be used to maintain a straight leader in the upper half of the tree.
3. Plant quality at or below the soil line:
 - a. Plant roots shall be normal to the plant type specified. Root observations shall take place without impacting tree health. Root quality at or below the soil line shall comply with the the following:
 - 1.) The roots shall be reasonably free of scrapes, broken or split wood.
 - 2.) The root system shall be reasonably free of injury from biotic (e.g., insects and pathogens) and abiotic (e.g., herbicide toxicity and salt injury) agents. Wounds resulting from root pruning used to produce a high quality root system are not considered injuries.

- 3.) A minimum of three structural roots reasonably distributed around the trunk (not clustered on one side) shall be found in each plant. Root distribution shall be uniform throughout the root ball, and growth shall be appropriate for the species.
 - a.) Plants with structural roots on only one side of the trunk (J roots) shall be rejected.
- 4.) The root collar shall be within the upper 2 inches of the substrate/soil. Two structural roots shall reach the side of the root ball near the top surface of the root ball.
- 5.) The root system shall be reasonably free of stem girdling roots over the root collar or kinked roots from nursery production practices.
- 6.) At time of observations and delivery, the root ball shall be moist throughout. Roots shall not show signs of excess soil moisture conditions as indicated by stunted, discolored, distorted, or dead roots.

2.10 ROOT BALL PACKAGE OPTIONS: The following root ball packages are permitted. Specific root ball packages shall be required where indicated on the plant list or in this specification. Any type of root ball packages that is not specifically defined in this specification shall not be permitted.

A. BALLED AND BURLAPPED PLANTS

1. All Balled and Burlapped Plants shall be field grown, and the root ball packaged in a burlap and twine and/or burlap and wire basket package.
2. Plants shall be harvested with the following modifications to standard nursery practices.
 - a. Prior to digging any tree that fails to meet the requirement for maximum soil and roots above the root collar, carefully removed the soil from the top of the root ball of each plant, using hand tools, water or an air spade, to locate the root collar and attain the soil depth over the structural roots requirements. Remove all stem girdling roots above the root collar. Care must be exercised not to damage the surface of the root collar and the top of the structural roots.
 - b. Trees shall be dug for a minimum of 4 weeks and a maximum of 52 weeks prior to shipping. Trees dug 4 to 52 weeks prior to shipping are defined as hardened-off. Digging is defined as cutting all roots and lifting the tree out of the ground and either moving it to a new location in the nursery or placing it back into the same hole. Trees that are stored out of the ground shall be placed in a holding area protected from extremes of wind and sun with the root ball protected by covering with mulch or straw and irrigated sufficiently to keep moisture in the root ball above wilt point and below saturation
 - c. If wire baskets are used to support the root ball, a "low profile" basket shall be used. A low profile basket is defined as having the top of the highest loops on the basket no less than 4 inches and no greater than 8 inches below the shoulder of the root ball package.
 - 1.) At nurseries where sandy soils prevent the use of "low profile baskets", baskets that support the entire root ball, including the top, are allowable.

- d. Twine and burlap used for wrapping the root ball package shall be natural, biodegradable material. If the burlap decomposes after digging the tree then the root ball shall be re-wrapped prior to shipping if roots have not yet grown to keep root ball intact during shipping.

B. SPADE HARVESTED AND TRANSPLANTED

1. Spade Harvested and Transplanted Plants shall meet all the requirements for field grown trees. Root ball diameters shall be of similar size as the ANSI Z60.1 requirements for Balled and Burlapped plants.
2. Trees shall be harvested prior to leafing out (bud break) in the spring or during the fall planting period except for plants known to be considered as fall planting hazards. Plants that are fall planting hazards shall only be harvested prior to leafing out in the spring.

C. CONTAINER (INCLUDING ABOVE-GROUND FABRIC CONTAINERS AND BOXES) PLANTS

1. Container plants may be permitted only when indicated on the drawing, in this specification, or approved by the Owner's Representative.
2. Provide plants shall be established and well rooted in removable containers.
3. Container class size shall conform to ANSI Z60.1 for container plants for each size and type of plant.

D. BARE ROOT PLANTS

1. Harvest bare root plants while the plant is dormant and a minimum of 4 weeks prior to leaf out (bud break).
2. The root spread dimensions of the harvested plants shall conform to ANSI Z60.1 for nursery grown bare root plants for each size and type of plant. Just prior to shipping to the job site, dip the root system into a slurry of hydrogel (cross linked polyacrylamide) and water mixed at a rate of 15 oz. of hydrogel in 25 gallons of water. Do not shake off the excess hydrogel. Place the root system in a pleated black plastic bag and tie the bag snugly around the trunk. Bundle and tie the upper branches together.
3. Keep the trees in a cool dark space for storage and delivery.
4. Where possible, plan time of planting to be before bud break

2.11 ANNUAL FLOWERING AND SEASONAL COLOR PLANTS

- A. Container or flat-grown plants should be sized as noted in the planting plan. Plants shall be well-rooted and healthy.

2.12 PLANTING SOIL

- A. Planting Soil as used in this specification means the soil at the planting site, or imported as modified and defined in specification Section Planting Soil. If there is no Planting Soil specification, the term Planting Soil shall mean the soil at the planting site within the planting hole.

2.13 MULCH

- A. Mulch shall be "Walk on" grade, coarse, ground, from tree and woody brush sources. The size range shall be a minimum (less than 25% or less of volume)

fine particles 3/8 inch or less in size, and a maximum size of individual pieces (largest 20% or less of volume) shall be approximately 1 to 1-1/2 inch in diameter and maximum length approximately 4 to 8". Pieces larger than 8 inch long that are visible on the surface of the mulch after installation shall be removed.

1. It is understood that mulch quality will vary significantly from supplier to supplier and region to region. The above requirements may be modified to conform to the source material from locally reliable suppliers as approved by the Owner's Representative.

B. Submit supplier's product specification data sheet and a one gallon sample for approval.

2.14 TREE STAKING AND GUYING MATERIAL

A. Tree guying to be flat woven polypropylene material, 3/4 inch wide, and 900 lb. break strength. Color to be Green. Product to be ArborTie manufactured by Deep Root Partners, L.P. or approved equal.

B. Stakes shall be lodge pole stakes free of knots and of diameters and lengths appropriate to the size of plant as required to adequately support the plant.

C. Below ground anchorage systems to be constructed of 2 x 2 dimensional untreated wood securing (using 3 inch long screws) horizontal portions to 4 feet long vertical stakes driven straight into the ground outside the root ball.

PART 3 – EXECUTION

3.1 SITE EXAMINATION

A. Prior to installation of Planting Soil, examine site to confirm that existing conditions are satisfactory for the work of this section to proceed.

1. Confirm that the subgrade is at the proper elevation and compacted as required.
2. Confirm that surface all areas to be filled with Planting Soil are free of construction debris, refuse, compressible or biodegradable materials, stones greater than 2 inches diameter, soil crusting films of silt or clay that reduces or stops drainage from the Planting Soil into the subsoil; and/or standing water. Remove unsuitable material from the site.
3. Confirm that no adverse drainage conditions are present.
4. Confirm that no conditions are present which are detrimental to plant growth.
5. Confirm that utility work has been completed per the drawings.
6. Confirm that irrigation work, which is to be installed below prepared soil levels, has been completed.

B. If unsatisfactory conditions are encountered, notify the Owner's Representative immediately to determine corrective action before proceeding.

3.2 PLANTING SEASON

A. Planting shall only be performed when weather and soil conditions are suitable for planting the materials specified in accordance with locally accepted practice.

1. Deciduous material, container stock, all times of year. No planting over 90 degrees or wind over 30 mph. No planting in frozen material or

2. excessively wet.
Evergreen material, container stock, all times of year. No planting over 90 degrees or wind over 30 mph. No planting in frozen material or excessively wet.

3.3 ADVERSE WEATHER CONDITIONS

- A. No planting shall take place during extremely hot, dry, windy or freezing weather.

3.4 COORDINATION WITH PROJECT WORK

- A. The Contractor shall coordinate with all other work that may impact the completion of the work.
- B. Prior to the start of work, prepare a detailed schedule of the work for coordination with other trades.
- C. Coordinate the relocation of any irrigation lines, heads or the conduits of other utility lines that are in conflict with tree locations. Root balls shall not be altered to fit around lines. Notify the Owner's Representative of any conflicts encountered.

3.5 GRADE AND ELEVATION CONTROL

- A. Provide grade and elevation control during installation of Planting Soil. Utilize grade stakes, surveying equipment, and other means and methods to assure that grades and contours conform to the grades indicated on the plans.

3.6 SITE PREPARATION

- A. Excavate to the proposed subgrade. Maintain all required angles of repose of the adjacent materials as shown on the drawings or as required by this specification. Do not over excavate compacted subgrades of adjacent pavement or structures. Maintain a supporting 1:1 side slope of compacted subgrade material along the edges of all paving and structures where the bottom of the paving or structure is above the bottom elevation of the excavated planting area.
- B. Remove all construction debris and material including any construction materials from the subgrade.
- C. Confirm that the subgrade is at the proper elevation and compacted as required. Subgrade elevations shall slope approximately parallel to the finished grade and/or toward the subsurface drain lines as shown on the drawings.
- D. In areas where Planting Soil is to be spread, confirm subgrade has been scarified.
- E. Protect adjacent walls, walks and utilities from damage or staining by the soil. Use 1/2 inch plywood and or plastic sheeting as directed to cover existing concrete, metal and masonry work and other items as directed during the progress of the work.
 1. At the end of each working day, clean up any soil or dirt spilled on any paved surface.
 2. Any damage to the paving or site features or work shall be repaired at the Contractor's expense.

3.7 SOIL MOISTURE

- A. Volumetric soil moisture level, in both the Planting Soil and the root balls of all plants, prior to, during and after planting shall be above permanent wilt point and below field capacity for each type of soil texture within the following ranges.

Soil texture	Permanent wilting point	Field capacity
Sand, Loamy sand, Sandy loam	5-8%	12-18%
Loam, Sandy clay, Sandy clay loam	14-25%	27-36%
Clay loam, Silt loam	11-22%	31-36%
Silty clay, Silty clay loam	22-27%	38-41%

- B. The Contractor shall confirm the soil moisture levels with a moisture meter (Digital Soil Moisture Meter, DSMM500 by General Specialty Tools and Instruments, or approved equivalent). If moisture is found to be too low, the planting holes shall be filled with water and allowed to drain before starting any planting operations. If the moisture is too high, suspend planting operations until the soil moisture drains to below field capacity.

3.8 EXISTING SOIL MODIFICATION

- A. Follow the requirements for modifying existing soil as indicated in Part 2 for the different types of soil modifications.

3.9 PLANTING SOIL AND PLANTING SOIL MIX INSTALLATION

- A. In areas of soil installation above existing subsoil, scarify the subgrade material prior to installing Planting Soil.
1. Scarify the subsoil of the subgrade to a depth of 3 – 6 inches with the teeth of the back hoe or loader bucket, tiller or other suitable device.
 2. Immediately install the Planting Soil. Protect the loosened area from traffic. DO NOT allow the loosened subgrade to become compacted.
 3. In the event that the loosened area becomes overly compacted, loosen the area again prior to installing the Planting Soil.
- B. Install the Planting Soil in 12 - 18 inch lifts to the required depths. Apply compacting forces to each lift as required to attain the required compaction. Scarify the top of each lift prior to adding more Planting Soil.
- C. Phase work such that equipment to deliver or grade soil does not have to operate over previously installed Planting Soil.
- D. Where possible place large trees first and fill Planting Soil around the root ball.
- E. Installing soil with soil or mulch blowers or soil slingers shall not be permitted due to the over mixing and soil ped breakdown cause by this type of equipment.
- F. Where travel over installed soil is unavoidable, limit paths of traffic to reduce the

impact of compaction in Planting Soil. Comply with the paragraph "Compaction Reduction" (section 3.9) in the event that soil becomes over compacted.

- G. The grades shown on the drawings are the final grades after settlement and shrinkage of the compost material. The Contractor shall install the Planting Soil at a higher level to anticipate this reduction of Planting Soil volume. A minimum settlement of approximately 10 - 15% of the soil depth is expected. All grade increases are assumed to be as measured prior to addition of surface Compost till layer, mulch, or sod.

3.10 COMPACTION REQUIREMENTS FOR INSTALLED OR MODIFIED PLANTING SOIL

- A. Compact installed Planting Soil to the compaction rates indicated and using the methods approved. Compact each soil lift as the soil is installed.
- B. Existing soil that is modified by tilling or fracturing shall have a density to the depth of the modification, after completion of the loosening, such that the penetrometer reads approximately 75 to 250 psi at soil moisture approximately the mid-point between wilting point and field capacity. This will be approximately between 75 and 82% of maximum dry density standard proctor.
- C. Installed Planting Soil Mix and re-spread existing soil shall have a soil density through the required depth of the installed layers of soil, such that the penetrometer reads approximately 75 to 250 psi at soil moisture approximately the mid-point between wilt point and field capacity. This will be approximately between 75 and 82% of maximum dry density standard proctor.
- D. Planting Soil compaction shall be tested at each lift using a penetrometer.
- E. Maintain moisture conditions within the Planting Soil during installation or modification to allow for satisfactory compaction. Suspend operations if the Planting Soil becomes wet. Apply water if the soil is overly dry.
- F. Provide adequate equipment to achieve consistent and uniform compaction of the Planting Soils. Use the smallest equipment that can reasonably perform the task of spreading and compaction.
- G. Do not pass motorized equipment over previously installed and compacted soil except as authorized below.
 - 1. Light weight equipment such as trenching machines or motorized wheel barrows is permitted to pass over finished soil work.
 - 2. If work after the installation and compaction of soil compacts the soil to levels greater than the above requirements, follow the requirements of the paragraph "Over Compaction Reduction" below.

3.11 OVER COMPACTION REDUCTION

- A. Any soil that becomes compacted to a density greater than the specified density shall be dug up and reinstalled. This requirement includes compaction caused by other sub-contractors after the Planting Soil is installed and approved.
- B. Surface roto tilling shall not be considered adequate to reduce over compaction at levels 6 inches or greater below finished grade.

3.12 INSTALLATION OF CHEMICAL ADDITIVES

- A. Following the installation of each soil and prior to fine grading and installation of the Compost till layer, apply chemical additives as recommended by the soil test, and appropriate to the soil and specific plants to be installed.
- B. Types, application rates and methods of application shall be approved by the Owner's Representative prior to any applications.

3.13 FINE GRADING

- A. The Owner's Representative shall approve all rough grading prior to the installation of Compost, fine grading, planting, and mulching.
- B. Grade the finish surface of all planted areas to meet the grades shown on the drawings, allowing the finished grades to remain higher (10 – 15% of depth of soil modification) than the grades on the grading plan, as defined in paragraph Planting Soil Installation, to anticipate settlement over the first year.
- C. Utilize hand equipment, small garden tractors with rakes, or small garden tractors with buckets with teeth for fine grading to keep surface rough without further compaction. Do not use the flat bottom of a loader bucket to fine grade, as it will cause the finished grade to become overly smooth and or slightly compressed.
- D. Provide for positive drainage from all areas toward the existing inlets, drainage structures and or the edges of planting beds. Adjust grades as directed to reflect actual constructed field conditions of paving, wall and inlet elevations. Notify the Owner's Representative in the event that conditions make it impossible to achieve positive drainage.
- E. Provide smooth, rounded transitions between slopes of different gradients and direction. Modify the grade so that the finish grade before adding mulch and after settlement is one or two inches below all paving surfaces or as directed by the drawings.
- F. Fill all dips and remove any bumps in the overall plane of the slope. The tolerance for dips and bumps in shrub and ground cover planting areas shall be a 2 inch deviation from the plane in 10 feet. The tolerance for dips and bumps in lawn areas shall be a 1 inch deviation from the plane in 10 feet.

3.14 INSTALLATION OF COMPOST TILL LAYER

- A. After Planting Soil Mixes are installed in planting bed areas and just prior to the installation of shrub or groundcover plantings, spread 3 – 4 inches of Compost over the beds and roto till into the top 4 - 6 inches of the Planting Soil. This step will raise grades slightly above the grades required in paragraph "Fine Grading". This specification anticipates that the raise in grade due to this tilling will settle within a few months after installation as Compost breaks down. Additional settlement as defined in paragraph "Planting Soil and Planting Soil Mix installation" must still be accounted for in the setting of final grades.

3.15 LAYOUT AND PLANTING SEQUENCE

- A. Relative positions of all plants and trees are subject to approval of the Owner's

Representative.

- B. Notify the Owner's Representative, one (1) week prior to layout. Layout all individual tree and shrub locations. Place plants above surface at planting location or place a labeled stake at planting location. Layout bed lines with paint for the Owner's Representative's approval. Secure the Owner's Representative's acceptance before digging and start of planting work.
- C. When applicable, plant trees before other plants are installed.
- D. It is understood that plants are not precise objects and that minor adjustments in the layout will be required as the planting plan is constructed. These adjustments may not be apparent until some or all of the plants are installed. Make adjustments as required by the Owner's Representative including relocating previously installed plants.

3.16 SOIL PROTECTION DURING PLANT DELIVERY AND INSTALLATION

- A. Protect soil from compaction during the delivery of plants to the planting locations, digging of planting holes and installing plants.
 - 1. Where possible deliver and plant trees that require the use of heavy mechanized equipment prior to final soil preparation and tilling. Where possible, restrict the driving lanes to one area instead of driving over and compacting a large area of soil.
 - 2. Till to a depth of 6 inches, all soil that has been driven over during the installation of plants.

3.17 INSTALLATION OF PLANTS: GENERAL

- A. Observe each plant after delivery and prior to installation for damage of other characteristics that may cause rejection of the plant. Notify the Owner's Representative of any condition observed.
- B. No more plants shall be distributed about the planting bed area than can be planted and watered on the same day.
- C. The root system of each plant, regardless of root ball package type, shall be observed by the Contractor, at the time of planting to confirm that the roots meet the requirements for plant root quality in Part 2 Products: Plants General: Plant Quality. The Contractor shall undertake at the time of planting, all modifications to the root system required by the Owner's Representative to meet these quality standards.
 - 1. Modifications, at the time of planting, to meet the specifications for the depth of the root collar and removal of stem girdling roots and circling roots may make the plant unstable or stress the plant to the point that the Owner's Representative may choose to reject the plant rather than permitting the modification.
 - 2. Any modifications required by the Owner's Representative to make the root system conform to the plant quality standards outlined in Part 2 Products: Plants General: Quality, or other requirements related to the permitted root ball package, shall not be considered as grounds to modify or void the plant warranty.
 - 3. The resulting root ball may need additional staking and water after planting. The Owner's Representative may reject the plant if the root

modification process makes the tree unstable or if the tree is not healthy at the end of the warranty period. Such plants shall still be covered under the warranty

- D. Container and Boxed Root Ball Shaving: The outer surfaces of ALL plants in containers and boxes, including the top, sides and bottom of the root ball shall be shaved to remove all circling, descending, and matted roots. Shaving shall be performed using saws, knives, sharp shovels or other suitable equipment that is capable of making clean cuts on the roots. Shaving shall remove a minimum of one inch of root mat or up to 2 inches as required to remove all root segments that are not growing reasonably radial to the trunk.
- E. Exposed Stem Tissue after Modification: The required root ball modifications may result in stem tissue that has not formed trunk bark being exposed above the soil line. If such condition occurs, wrap the exposed portion of the stem in a protective wrapping with a white filter fabric. Secure the fabric with biodegradable masking tape. DO NOT USE string, twine, green nursery ties or any other material that may girdle the trunk if not removed.
- F. Excavation of the Planting Space: Using hand tools or tracked mini-excavator, excavate the planting hole into the Planting Soil to the depth of the root ball measured after any root ball modification to correct root problems, and wide enough for working room around the root ball or as noted below.
 - 1. For trees and shrubs planted in soil areas that are NOT tilled or otherwise modified to a depth of at least 12 inches over a distance of more than 10 feet radius from each tree, or 5 feet radius from each shrub, the soil around the root ball shall be loosened as defined below.
 - a. The area of loosening shall be a minimum of 3 times the diameter of the root ball at the surface sloping to 2 times the diameter of the root ball at the depth of the root ball.
 - b. Loosening is defined as digging into the soil and turning the soil to reduce the compaction. The soil does not have to be removed from the hole, just dug, lifted and turned. Lifting and turning may be accomplished with a tracked mini excavator, or hand shovels.
 - 2. If an auger is used to dig the initial planting hole, the soil around the auger hole shall be loosened as defined above for trees and shrubs planted in soil areas that are NOT tilled or otherwise modified.
 - 3. The measuring point for root ball depth shall be the average height of the outer edge of the root ball after any required root ball modification.
 - 4. If motorized equipment is used to deliver plants to the planting area over exposed planting beds, or used to loosen the soil or dig the planting holes, all soil that has been driven over shall be tilled to a depth of 6 inches.
- G. Set top outer edge of the root ball at the average elevation of the proposed finish. Set the plant plumb and upright in the center of the planting hole. The tree graft, if applicable, shall be visible above the grade. Do not place soil on top of the root ball.
- H. The Owner's Representative may request that plants orientation be rotated when planted based on the form of the plant.
- I. Backfill the space around the root ball with the same planting soil or existing soil that was excavated for the planting space. See Specification Section Planting

Soil, for requirements to modify the soil within the planting bed.

- J. Brace root ball by tamping Planting Soil around the lower portion of the root ball. Place additional Planting Soil around base and sides of ball in six-inch (6") lifts. Lightly tamp each lift using foot pressure or hand tools to settle backfill, support the tree and eliminate voids. DO NOT over compact the backfill or use mechanical or pneumatic tamping equipment. Over compaction shall be defined as greater than 85% of maximum dry density, standard proctor or greater than 250 psi as measured by a cone penetrometer when the volumetric soil moisture is lower than field capacity.
 - 1. When the planting hole has been backfilled to three quarters of its depth, water shall be poured around the root ball and allowed to soak into the soil to settle the soil. Do not flood the planting space. If the soil is above field capacity, allow the soil to drain to below field capacity before finishing the planting. Air pockets shall be eliminated and backfill continued until the planting soil is brought to grade level.
- K. Where indicated on the drawings, build a 4 inch high, level berm of Planting Soil around the outside of the root ball to retain water. Tamp the berm to reduce leaking and erosion of the saucer.
- L. Thoroughly water the Planting Soil and root ball immediately after planting.
- M. Remove all nursery plant identification tags and ribbons as per Owner's Representative instructions.
- N. Remove corrugated cardboard trunk protection after planting.
- O. Follow additional requirements for the permitted root ball packages.

3.18 PERMITTED ROOT BALL PACKAGES AND SPECIAL PLANTING REQUIREMENTS

- A. The following are permitted root ball packages and special planting requirements that shall be followed during the planting process in addition to the above General planting requirements.
- B. **BALLED AND BURLAPPED PLANTS**
 - 1. After the root ball has been backfilled, remove all twine and burlap from the top of the root ball. Cut the burlap away; do not fold down onto the Planting Soil.
 - 2. If the plant is shipped with a wire basket that does not meet the requirements of a "Low Rise" basket, remove the top 6 - 8 inches of the basket wires just before the final backfilling of the tree.
 - 3. Earth root balls shall be kept intact except for any modifications required by the Owner's Representative to make root package comply with the requirement in Part 2 Products.
- C. **SPADE HARVESTED AND TRANSPLANTED PLANTS**
 - 1. After installing the tree, loosen the soil along the seam between the root ball and the surrounding soil out to a radius from the root ball edge equal to the diameter of the root ball to a depth of 8 - 10 inches by hand digging to disturb the soil interface.
 - 2. Fill any gaps below this level with loose soil.

- D. CONTAINER (INCLUDES BOXED AND ABOVE-GROUND FABRIC CONTAINERS) PLANTS
1. This specification assumes that most container plants have significant stem girdling and circling roots, and that the root collar is too low in the root ball.
 2. Remove the container.
 3. Perform root ball shaving as defined in Installation of Plants: General above.
 4. Remove all roots and substrate above the root collar and the main structural roots according to root correction details so root system conforms to root observations detail.
 5. Remove all substrate at the bottom of the root ball that does not contain roots.
 6. Using a hose, power washer or air excavation device, wash out the substrate from around the trunk and top of the remaining root ball and find and remove all stem girdling roots within the root ball above the top of the structural roots.
- E. BARE ROOT PLANTS
1. Dig the planting hole to the diameter of the spread of the roots to a depth in the center that maintains the root collar at the elevation of the surrounding finished grade and slightly deeper along the edges of the hole.
 2. Spread all roots out radial to the trunk in the prepared hole making the hole wider where needed to accommodate long roots. Root tips shall be directed away from the trunk. Prune any broken roots removing the least amount of tissue possible.
 3. Maintain the trunk plumb while backfilling soil around the roots.
 4. Lightly tamp the soil around the roots to eliminate voids and reduce settlement.

3.19 GROUND COVER, PERENNIAL AND ANNUAL PLANTS

- A. Assure that soil moisture is within the required levels prior to planting. Irrigation, if required, shall be applied at least 12 hours prior to planting to avoid planting in muddy soils.
- B. Assure that soil grades in the beds are smooth and as shown on the plans.
- C. Ground cover shall cover one hundred percent of the exposed ground within three years. Contractor to evaluate plant coverage after one year in order to determine if additional plantings will be required. No bark mulch shall be allowed under the canopy of shrubs and within two feet of the base of trees.
- D. Plants shall be planted in even, triangularly spaced rows, at the intervals called out for on the drawings, unless otherwise noted. The first row of Annual flower plants shall be 6 inches from the bed edge unless otherwise directed.
- E. Dig planting holes sufficiently large enough to insert the root system without deforming the roots. Set the top of the root system at the grade of the soil.
- F. Schedule the planting to occur prior to application of the mulch. If the bed is already mulched, pull the mulch from around the hole and plant into the soil. Do not plant the root system in the mulch. Pull mulch back so it is not on the root ball

surface.

- G. Press soil to bring the root system in contact with the soil.
- H. Spread any excess soil around in the spaces between plants.
- I. Apply mulch to the bed being sure not to cover the tops of the plants with or the tops of the root ball with mulch.
- J. Water each planting area as soon as the planting is completed. Apply additional water to keep the soil moisture at the required levels. Do not over water.

3.20 STAKING AND GUYING

- A. Do not stake or guy trees unless specifically required by the Contract Documents, or in the event that the Contractor feels that staking is the only alternative way to keep particular trees plumb.
 - 1. The Owner's Representative shall have the authority to require that trees are staked or to reject staking as an alternative way to stabilize the tree.
 - 2. Trees that required heavily modified root balls to meet the root quality standards may become unstable. The Owner's Representative may choose to reject these trees rather than utilize staking to temporarily support the tree.
- B. Trees that are guyed shall have their guys and stakes removed after one full growing season or at other times as required by the Owner's Representative.
- C. Tree guying shall utilize the tree staking and guying materials specified. Guying to be tied in such a manner as to create a minimum 12-inch loop to prevent girdling. Refer to manufacturer's recommendations and the planting detail for installation.
 - 1. Plants shall stand plumb after staking or guying.
 - 2. Stakes shall be driven to sufficient depth to hold the tree rigid.

3.21 STRAIGHTENING PLANTS

- A. Maintain all plants in a plumb position throughout the warranty period. Straighten all trees that move out of plumb including those not staked. Plants to be straightened shall be excavated and the root ball moved to a plumb position, and then re-backfilled.
- B. Do not straighten plants by pulling the trunk with guys.

3.22 INSTALLATION OF FERTILIZER AND OTHER CHEMICAL ADDITIVES

- A. Do not apply any soluble fertilizer to plantings during the first year after transplanting unless soil test determines that fertilizer or other chemical additives is required. Apply chemical additives only upon the approval of the Owner's Representative.
- B. Controlled release fertilizers shall be applied according to the manufacturer's instructions and standard horticultural practices.

3.23 PRUNING OF TREES AND SHRUBS

- A. Pruning trees shall be limited to addressing structural defects; follow recommendations in "Structural Pruning: A Guide For The Green Industry" published by Urban Tree Foundation, Visalia CA.
- B. All pruning shall be performed by a person experienced in structural tree pruning.
- C. Except for plants specified as multi-stemmed or as otherwise instructed by the Owner's Representative, preserve or create a central leader.
- D. Small trees can be structurally pruned by laying them over before planting. Pruning may also be performed at the nursery prior to shipping.
- E. Remove and replace excessively pruned or malformed stock resulting from improper pruning that occurred in the nursery or after.
- F. Pruning shall be done with clean, sharp tools.
- G. No tree paint or sealants shall be used.

3.24 MULCHING OF PLANTS

- A. Apply 2 inches of mulch before settlement, covering the entire planting bed area. Install no more than 1 inch of mulch over the top of the root balls of all plants. No bark mulch shall be allowed except under the canopy of shrubs and within 2 feet of the base of trees
- B. Lift all leaves, low hanging stems and other green portions of small plants out of the mulch if covered.

3.25 PLANTING BED FINISHING

- A. After planting, smooth out all grades between plants before mulching.
- B. Separate the edges of planting beds and lawn areas with a smooth, formed edge cut into the turf.

3.26 WATERING

- A. The Contractor shall be fully responsible to ensure that adequate water is provided to all plants from the point of installation until the date of Substantial Completion Acceptance. The Contractor shall adjust the automatic irrigation system, if available, and apply additional or adjust for less water using hoses as required.
- B. Hand water root balls of all plants to assure that the root balls have moisture above wilt point and below field capacity.

3.27 CLEAN-UP

- A. During installation, keep the site free of trash, pavements reasonably clean and work area in an orderly condition at the end of each day. Remove trash and debris in containers from the site no less than once a week.
 - 1. Immediately clean up any spilled or tracked soil, fuel, oil, trash or debris deposited by the Contractor from all surfaces within the project or on

public right of ways and neighboring property.

- B. Once installation is complete, wash all soil from pavements and other structures. Ensure that mulch is confined to planting beds and that all tags and flagging tape are removed from the site.
 - 1. Make all repairs to grades, ruts, and damage to the work or other work at the site.
 - 2. Remove and dispose of all excess Planting Soil, subsoil, mulch, plants, packaging, and other material brought to the site by the Contractor.

3.28 PLANTING SOIL AND MODIFIED EXISTING SOIL PROTECTION

- A. The Contractor shall protect installed and/or modified Planting Soil from damage including contamination and over compaction due to other soil installation, planting operations, and operations by other Contractors or trespassers. Maintain protection during installation until acceptance. Utilize fencing and matting as required or directed to protect the finished soil work. Treat, repair or replace damaged Planting Soil immediately.
- B. Loosen compacted Planting Soil and replace Planting Soil that has become contaminated as determined by the Owner's Representative. Planting Soil shall be loosened or replaced at no expense to the Owner.
 - 1. Till and restore grades to all soil that has been driven over or compacted during the installation of plants.
 - 2. Where modified existing soil has become contaminated and needs to be replaced, provide imported soil that is of similar composition, depth and density as the soil that was removed.

3.29 PROTECTION DURING CONSTRUCTION

- A. The Contractor shall protect planting and related work and other site work from damage due to planting operations, operations by other Contractors or trespassers.
 - 1. Maintain protection during installation until the date of plant acceptance (see specifications section – Planting). Treat, repair or replace damaged work immediately.
 - 2. Provide temporary erosion control as needed to stop soil erosion until the site is stabilized with mulch, plantings or turf.
- B. Damage done by the Contractor, or any of their sub-contractors to existing or installed plants, or any other parts of the work or existing features to remain, including large existing trees, soil, paving, utilities, lighting, irrigation, other finished work and surfaces including those on adjacent property, shall be cleaned, repaired or replaced by the Contractor at no expense to the Owner. The Owner's Representative shall determine when such cleaning, replacement or repair is satisfactory. Damage to existing trees shall be assessed by a certified arborist.

3.30 SUBSTANTIAL COMPLETION ACCEPTANCE

- A. Upon written notice from the Contractor, the Owners Representative shall review the work and make a determination if the work is substantially complete.
- B. The date of substantial completion of the planting soil and planting shall be the

date when the Owner's Representative accepts that all work in Planting, Planting Soil, and Irrigation installation sections is complete.

- C. The Plant Warranty period begins at date of written notification of substantial completion from the Owner's Representative. The date of substantial completion may be different than the date of substantial completion for the other sections of the project.

3.31 MAINTENANCE DURING THE WARRANTY PERIOD by others

- A. After Substantial Completion Acceptance, the Contractor shall make sufficient site visits to observe the Owner's maintenance and become aware of problems with the maintenance in time to request changes, until the date of End of Warranty Final Acceptance.
 - 1. Notify the Owner's Representative in writing if maintenance, including watering, is not sufficient to maintain plants in a healthy condition. Such notification must be made in a timely period so that the Owner's Representative may take corrective action.
 - a. Notification must define the maintenance needs and describe any corrective action required.
 - 2. In the event that the Contractor fails to visit the site and or notify, in writing, the Owner's Representative of maintenance needs, lack of maintenance shall not be used as grounds for voiding or modifying the provisions of the warranty.

3.32 END OF WARRANTY FINAL ACCEPTANCE / MAINTENANCE OBSERVATION

- A. At the end of the Warranty and Maintenance period the Owner's Representative shall observe the work and establish that all provisions of the contract are complete and the work is satisfactory.
 - 1. If the work is satisfactory, the maintenance period will end on the date of the final observation.
 - 2. If the work is deemed unsatisfactory, the maintenance period will continue at no additional expense to the Owner until the work has been completed, observed, and approved by the Owner's Representative.
- B. FAILURE TO PASS OBSERVATION: If the work fails to pass final observation, any subsequent observations must be rescheduled as per above. The cost to the Owner for additional observations will be charged to the Contractor at the prevailing hourly rate of the Owners Representative.

3.33 FINAL ACCEPTANCE / SOIL SETTLEMENT

- A. At the end of the plant warrantee and maintenance period, (see Specification section - Planting) the Owner's Representative shall observe the soil installation work and establish that all provisions of the contract are complete and the work is satisfactory.
 - 1. Restore any soil settlement and or erosion areas to the grades shown on the drawings. When restoring soil grades remove plants and mulch and add soil before restoring the planting. Do not add soil over the root balls of plants or on top of mulch.
- B. Failure to pass acceptance: If the work fails to pass final acceptance, any subsequent observations must be rescheduled as per above. The cost to the Owner for additional observations will be charged to the Contractor at the

prevailing hourly rate of the Owner's Representative.

END OF SECTION

IF THIS BAR DOES NOT MEASURE
1-INCH IN LENGTH, THEN THE
DRAWING IS NOT TO SCALE



CITY OF OREGON CITY
COMMUNITY DEVELOPMENT DEPARTMENT
1232 LINN AVE OREGON CITY



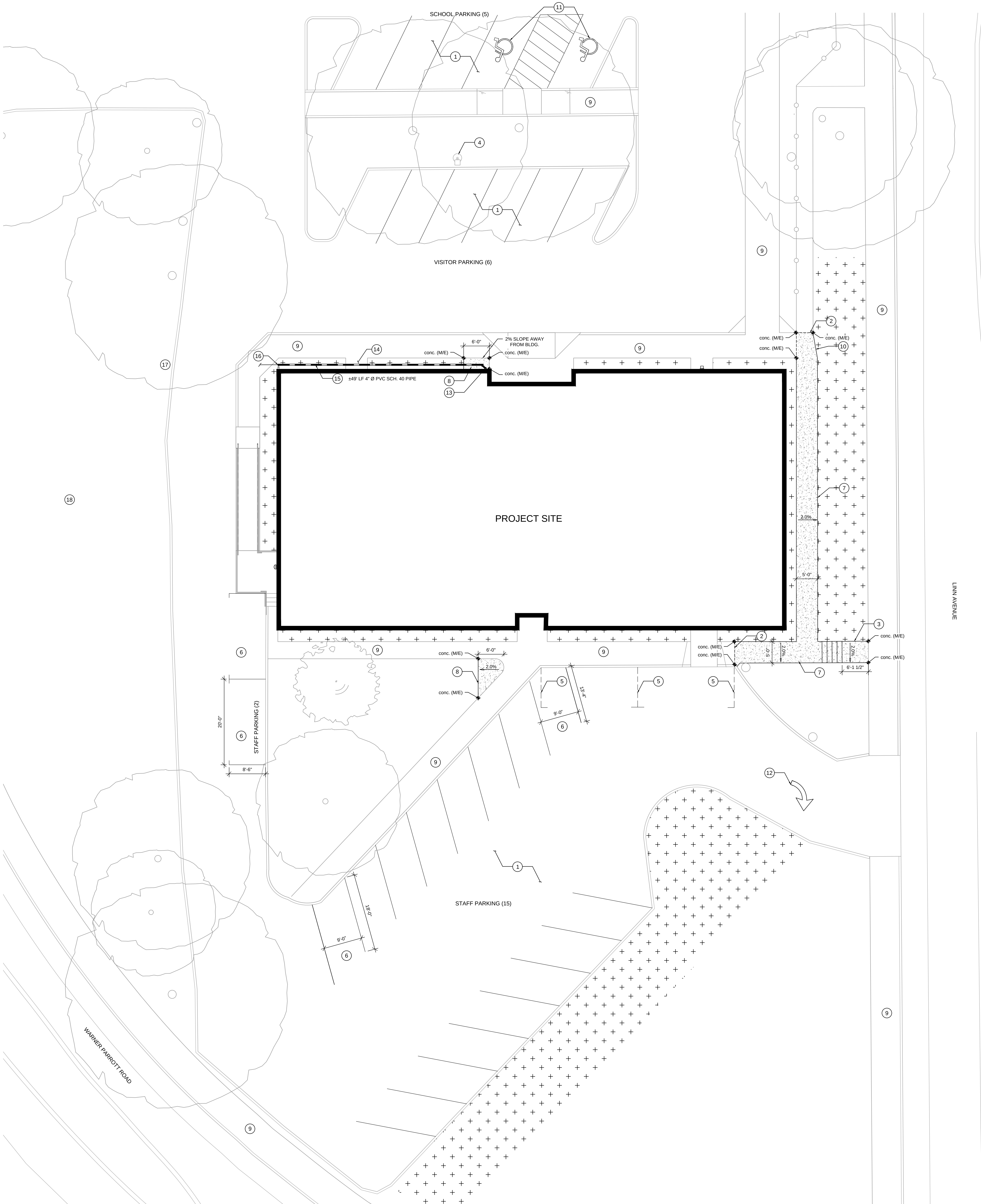
PROJECT NO:	P-2196-17
DRAWN:	MJC
CHECKED:	JCH
DATE:	10-19-17

REGISTERED ARCHITECT
JOËLLE HARRIS
Klamath Falls, OR
6927
STATE OF OREGON
EXPIRES: 12-31-17

COVER SHEET

A0.0

ISSUED FOR PERMIT/BID



1 CIVIL SITE & GRADING PLAN
C0.1 1"=10'

GENERAL CIVIL NOTES:

- ALL WORK AND MATERIALS SHALL CONFORM TO THE 2015 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT OREGON PLUMBING SPECIALTY CODE, AND ALL APPLICABLE STATE, CITY, AND COUNTY REGULATIONS AND STANDARDS.
- ALL WORK WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE COORDINATED WITH THE GOVERNING AGENCY'S INSPECTOR AND SHALL CONFORM TO THAT AGENCY'S CURRENT ENGINEERING STANDARD SPECIFICATIONS AND DETAILS.
- THE GENERAL CONTRACTOR AND ALL THEIR AFFILIATES SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, AND LOCATIONS PRIOR TO CONSTRUCTION. IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES.
- ALL CONSTRUCTION STAKING, GRADE SURVEYING, AND HORIZONTAL LAYOUT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PERFORMED BY A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF OREGON, COORDINATE WITH ENGINEER PRIOR TO CONSTRUCTION.
- ALL EXISTING UTILITIES IDENTIFIED IN THIS PLAN SET ARE NOT INTENDED TO BE EXACT OR COMPLETE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO IDENTIFY ALL UTILITIES AND PROTECT AS REQUIRED DURING THE COURSE OF CONSTRUCTION. CALL THE "OREGON UTILITY NOTIFICATION CENTER" AT 1-800-332-2344 TO LOCATE EXISTING UTILITIES. 48 HOURS BEFORE DIGGING.
- CONTRACTOR SHALL NOTIFY ALL APPLICABLE REGULATORY AGENCIES AND UTILITY COMPANIES 48 HOURS PRIOR TO BEGINNING WORK.
- ALL EXCAVATION, TRENCH BACK FILL, PARKING LOT/ROAD SUB-GRADE, FLAT WORK SUB-GRADE, COMPACTION REQUIREMENTS, ETC., SHALL BE AS NOTED IN THE SITE PREPARATION NOTES AND/OR THE PROJECT GEOTECHNICAL REPORT.
- ALL BASE ROCK PLACED UNDER PAVEMENT AND IN UTILITY TRENCHES SHALL CONFORM TO THE 2015 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- ALL ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE PAVEMENT AND ITS PLACEMENT SHALL CONFORM TO THE 2015 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- ALL SITE CONCRETE SHALL BE $f_c = 3000$ psi @ 28 DAYS. 6% ENTRAINED AIR, 4" SLUMP (UNLESS NOTED OTHERWISE). ALL CONCRETE WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE $f_c = 3300$ psi.
- ALL UTILITY SERVICES SHALL BE INSTALLED PER THE RESPECTIVE UTILITY CODES AND STANDARDS.
- ALL UTILITIES SHALL HAVE A MINIMUM COVER AS IDENTIFIED IN THE PLAN SET OR AS OTHERWISE SPECIFIED BY THE RESPECTIVE UTILITY COMPANY.
- ALL SERVICES SHALL BE ADEQUATELY MARKED AS TO IDENTIFY THE SIZE, TYPE, AND DEPTH OF THE SERVICE. CONTRACTOR TO PROVIDE LOCATE WIRE/TAPE AS REQUIRED BY THE APPLICABLE AGENCIES.
- ALL UNDERGROUND UTILITIES AND SERVICE LATERALS SHALL BE INSTALLED PRIOR TO CONSTRUCTION OF CURBS AND GUTTERS. CONTRACTOR SHALL STAMP CURBS OR SIDEWALKS (AS APPLICABLE) TO MARK THE LOCATIONS OF ALL SERVICE LINES (S - SANITARY, W - WATER, D - STORM DRAIN, G - GAS).
- ALL SERVICES AND SLEEVES SHALL BE PLUGGED AS REQUIRED TO ENSURE THAT NO FOREIGN MATERIALS ENTER THE LINE.
- CONTRACTOR SHALL OBTAIN ALL APPLICABLE PERMITS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. COORDINATE WITH THE ENGINEER PRIOR TO CONSTRUCTION TO IDENTIFY PERMIT REQUIREMENTS.
- ALL ON-SITE DOMESTIC WATER LINES SHALL BE PVC WATER PIPE CONFORMING TO ASTM D 1785 WITH SOLVENT-CEMENTED JOINTS. REFER TO MECHANICAL/PLUMBING PLANS FOR ALL PIPING REQUIREMENTS WITHIN 5' OF STRUCTURES.
- ALL TEMPORARY PROTECTION AND DIRECTION OF TRAFFIC SHALL BE BY THE CONTRACTOR AND CONFORM WITH BOTH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND THE ODOT MANUAL ON SHORT TERM TRAFFIC CONTROL (AS APPLICABLE).
- PREPARATION OF ALL LANDSCAPED AREAS SHALL BE AS NOTED ON THE LANDSCAPE PLANS. THE ENGINEER SHALL INSPECT ALL LANDSCAPE PLANTER GRADES PRIOR TO RECEIVING FINAL SURFACE TREATMENT.
- HOLD SUB-GRADE ELEVATIONS DOWN 6" WITHIN LANDSCAPE AREAS RECEIVING GROUND COVER AND/OR LAWN. REFER TO LANDSCAPE PLANS FOR ADDITIONAL INFORMATION PERTAINING TO TOP SOIL REQUIREMENTS.
- SEE LANDSCAPE PLANS FOR IRRIGATION SLEEVE PLACEMENT LOCATIONS AND REQUIREMENTS.
- ALL PAINTED MARKINGS SHALL BE INSTALLED WITH FAST DRYING TRAFFIC LINE PAINT APPLIED IN TWO SEPARATE APPLICATIONS PER THE OREGON APWA / ODOT STANDARD SPECIFICATIONS FOR CONSTRUCTION.
- SAND SEAL AND TACK ALL CUT ASPHALT EDGES WHEN PLACING NEW ASPHALT ADJACENT TO EXISTING ASPHALT.
- ALL IN LANDSCAPING TO RECEIVE IRRIGATION, TRENCH IRRIGATION ACROSS PARKING LOT AND PATCH ASPHALT WHERE NECESSARY. SEE SPECIFICATIONS.
- SEE PLAN SET FOR ADDITIONAL INFORMATION.

SITE PREPARATION NOTES:

- ALL AREAS BELOW ROADWAYS, PARKING AREAS, AND WALKWAYS SHALL BE CLEARED AND GRUBBED OF ALL PAVEMENT, FOREIGN MATTER, DEBRIS, ORGANIC AND DISTURBED MATERIAL (U.N.O.). STRIPPING DEPTHS WILL VARY DEPENDING ON LOCATION AND PAVEMENT SECTION REQUIREMENTS. ALL EXPOSED MATERIAL SHALL BE MOISTURE CONDITIONED TO WITHIN 2% OF OPTIMUM PRIOR TO PLACEMENT OF FILL MATERIAL DESCRIBED BELOW.
- ALL CLEARED AND GRUBBED MATERIAL NOT UTILIZED FOR THE PROJECT SHALL BE REMOVED FROM THE CONSTRUCTION SITE. CONTRACTOR SHALL COORDINATE APPROVED DISPOSAL LOCATION.
- ALL AREAS WITH ABANDONED UTILITY LINES, STORM DRAINS, UNDERGROUND TANKS, ETC. WHICH PROVIDE VOID SPACE BENEATH THE SURFACE SHALL BE LOCATED AND REMOVED PRIOR TO GRADINGS ACTIVITIES.
- ALL HOLES, DEPRESSIONS, AND UNDISTURBED NATIVE MATERIAL SHALL BE CLEARED OF ALL LOOSE AND ORGANIC MATERIAL PRIOR TO BACKFILLING WITH APPROVED STRUCTURAL FILL.
- AFTER CLEARING THE ABOVE MENTIONED AREAS, ALL EXPOSED SUB-GRADE SHALL BE PROOF ROLLED WITH A LOADED DUMP TRUCK OR HEAVY NON-VIBRATORY ROLLER. SOILS SHALL BE REMOVED AND RECOMPACTED OR REPLACED WITH APPROVED IMPORTED STRUCTURAL FILL IF THEY DO NOT DEMONSTRATE A FIRM, UNYIELDING CONDITION. CIVIL ENGINEER OF RECORD SHALL APPROVE SUB-GRADE SURFACE PRIOR TO STRUCTURAL FILL IMPORT EXPLAINED BELOW.

SITE PREPARATION NOTES (CONT.):

- APPROVED STRUCTURAL FILL SHALL BE IMPORTED AND PLACED BENEATH AREAS RECEIVING ASPHALT AND/OR CONCRETE PAVEMENT.
- STRUCTURAL FILL MATERIALS SHALL BE APPROVED BY THE CIVIL ENGINEER OF RECORD PRIOR TO IMPORTING. ALL FILL SHALL BE FREE OF ORGANIC AND EXPANSIVE CLAY MATERIAL. ALL BASE ROCK SHALL CONFORM TO THE SPECIFICATIONS IDENTIFIED IN THE PLAN SET.
- STRUCTURAL FILL PLACEMENT LIFTS TO BE DETERMINED BY THE CIVIL ENGINEER OF RECORD BASED ON MATERIAL PROPERTIES AND TYPE OF COMPACTION EQUIPMENT USED. BASE ROCK PLACEMENT LIFTS SHALL NOT EXCEED 8". EACH LIFT SHALL BE NEARLY EQUAL IN THICKNESS AND COMPACTED TO A MINIMUM OF 95% OF KASHTO T-99. FILLS SHALL BE PLACED AT OR SLIGHTLY ABOVE THEIR OPTIMUM MOISTURE CONTENT.

GENERAL EROSION CONTROL NOTES:

- G.C. SHALL IMPLEMENT AN EROSION CONTROL PLAN AS REQUIRED TO CONTAIN ALL SEDIMENT ON-SITE AND REMOVE ANY SEDIMENT THAT ENTERS RIGHT-OF-WAY DURING THE COURSE OF CONSTRUCTION. SPECIAL ATTENTION SHALL BE TAKEN AT ALL EXISTING STORM DRAIN INLETS AND STORM DRAIN CHANNELS AS TO ELIMINATE ANY SEDIMENT TRANSFER INTO THE EXISTING STORM DRAIN SYSTEM. ALL CONSTRUCTION SHALL BE MAINTAINED WITHIN THE DEVELOPMENT LIMITS OF THIS PHASE.
- IN ADDITION TO THE NOTES AND DETAILS REFERENCED ON THIS PLAN SET, ALL WORK AND MATERIALS SHALL CONFORM TO CLACKAMAS COUNTY ENGINEERING STANDARDS AND THE CURRENT OREGON/APWA STANDARD SPECIFICATIONS.

LANDSCAPE RESTORATION NOTES:

- CONTRACTOR SHALL RESTORE ANY LANDSCAPED AREA DAMAGED DURING CONSTRUCTION TO EXISTING CONDITIONS U.N.O. BY LANDSCAPE PLANS.

PLAN KEY NOTES

- INSTALL RE-STRIPING OF PARKING LOT AT (E) STALLS AS SHOWN ON PLAN AND PER DETAIL 5/C1.0
- REMOVE (E) CONCRETE SIDEWALK ALONG EAST SIDE OF BUILDING BETWEEN SAWCUTS AND REPLACE WITH (N) 5' WIDE SIDEWALK.
- CONSTRUCT 5' WIDE CONCRETE SIDEWALK WITH STAIRS CONNECTING TO (E) STREET SIDEWALK AS SHOWN ON PLAN AND PER CIVIL DETAILS 1&2/C1.0.
- (N) PARKING SIGN: "OREGON CITY PLANNING AND BUILDING VISITOR PARKING"
- (E) PARKING SPACE TO BE REMOVED. USE BLACK ASPHALT PAINT TO REMOVE (E) STRIPING.
- (N) PARKING SPACE. INSTALL STALL STRIPING AS SHOWN ON PLAN AND PER DETAIL 5/C1.0
- CONSTRUCT 5' WIDE CONCRETE SIDEWALK AT LOCATION SHOWN ON PLAN AND PER DETAIL 2&3/C1.0
- (N) CONCRETE BICYCLE PARKING PAD. CONSTRUCT 4" THICK CONCRETE SIDEWALK PER DETAIL 2/C1.0, OFCI BICYCLE PARKING RACKS
- (E) CONCRETE SIDEWALK TO REMAIN
- TAPER SIDEWALK AS SHOWN ON PLAN TO MATCH (E) SIDEWALK WIDTH.
- RE-PAINT ADA MARKINGS AT EXISTING LOCATION PER DETAIL 4/C1.0.
- INSTALL (N) RIGHT TURN ARROW PAINT AS SHOWN ON PLAN.
- CONNECT NEW BUILDING ROOF DRAIN DOWNSPOUT TO STORM DRAIN PIPE AS ON PLAN AND DETAIL 6/C1.0
- REMOVE AND REPLACE CONCRETE AS REQUIRED TO INSTALL DRAIN PIPE.
- INSTALL PVC SCHEDULE 40 STORM PIPE PER PLAN. CONTRACTOR TO PROVIDE POSITIVE SLOPE AND 12" MINIMUM COVER CONSTRUCT TRENCH SECTION PER DETAIL 7/C1.0.
- APPROXIMATE POINT OF CONNECTION TO EXISTING ROOF DRAIN STORM DISCHARGE PIPE. CONTRACTOR TO DETERMINE PROPER CONNECTION IN FIELD. CONTACT DESIGN ENGINEER IN THE EVENT OF CONFLICT.
- INSTALL NEW EMPLOYEE PARKING SIGN AS SHOWN ON PLAN AND DETAIL 8/C1.0.
- (ALTERNATE) INSTALL NEW FLAG POLE AS SHOWN ON PLAN AND DETAIL 9/C1.0.

LEGEND

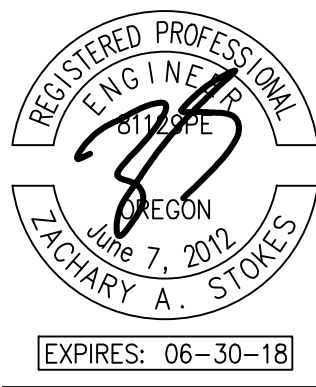
- CHAIN LINK FENCING
- SIDEWALK REPLACEMENT AREA
- LANDSCAPE IMPROVEMENTS, SEE SHEET L1.0 FOR LANDSCAPE PLAN
- TRAFFIC BOLLARD
- (E) TREE
- conc. (M/E)
NEW GRADE POINT TO MATCH EXISTING GRADE AT LOCATIONS SHOWN

ATTENTION:
OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS (503) 232-1987).

CITY OF OREGON CITY
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PROJECT NO: P-2195-17
DRAWN: JML
CHECKED: LGL
DATE: 10-19-17

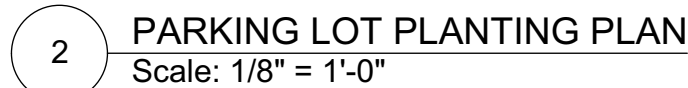
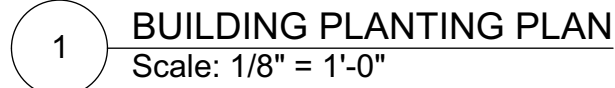


CIVIL SITE & GRADING
PLAN

C0.1

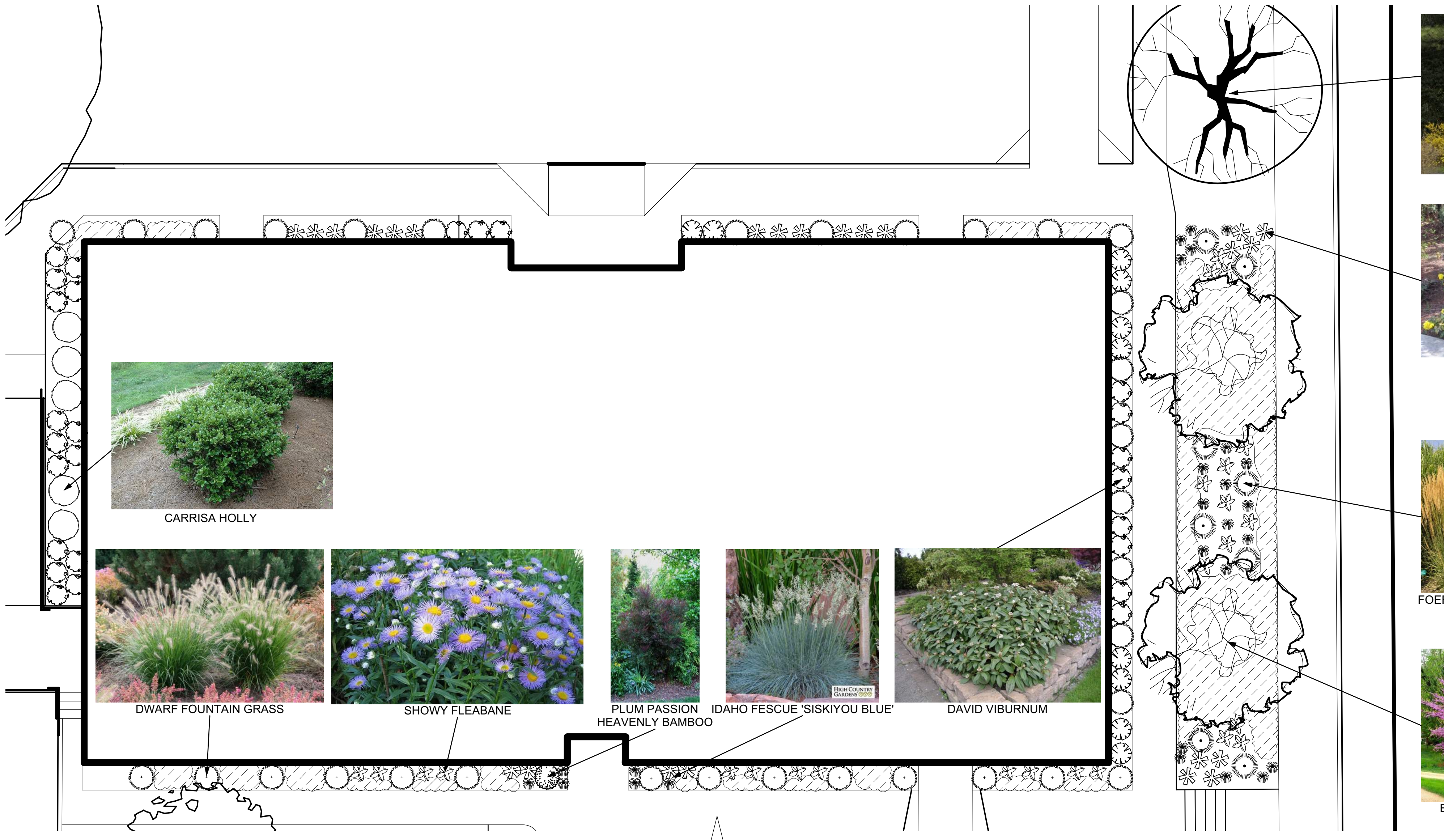
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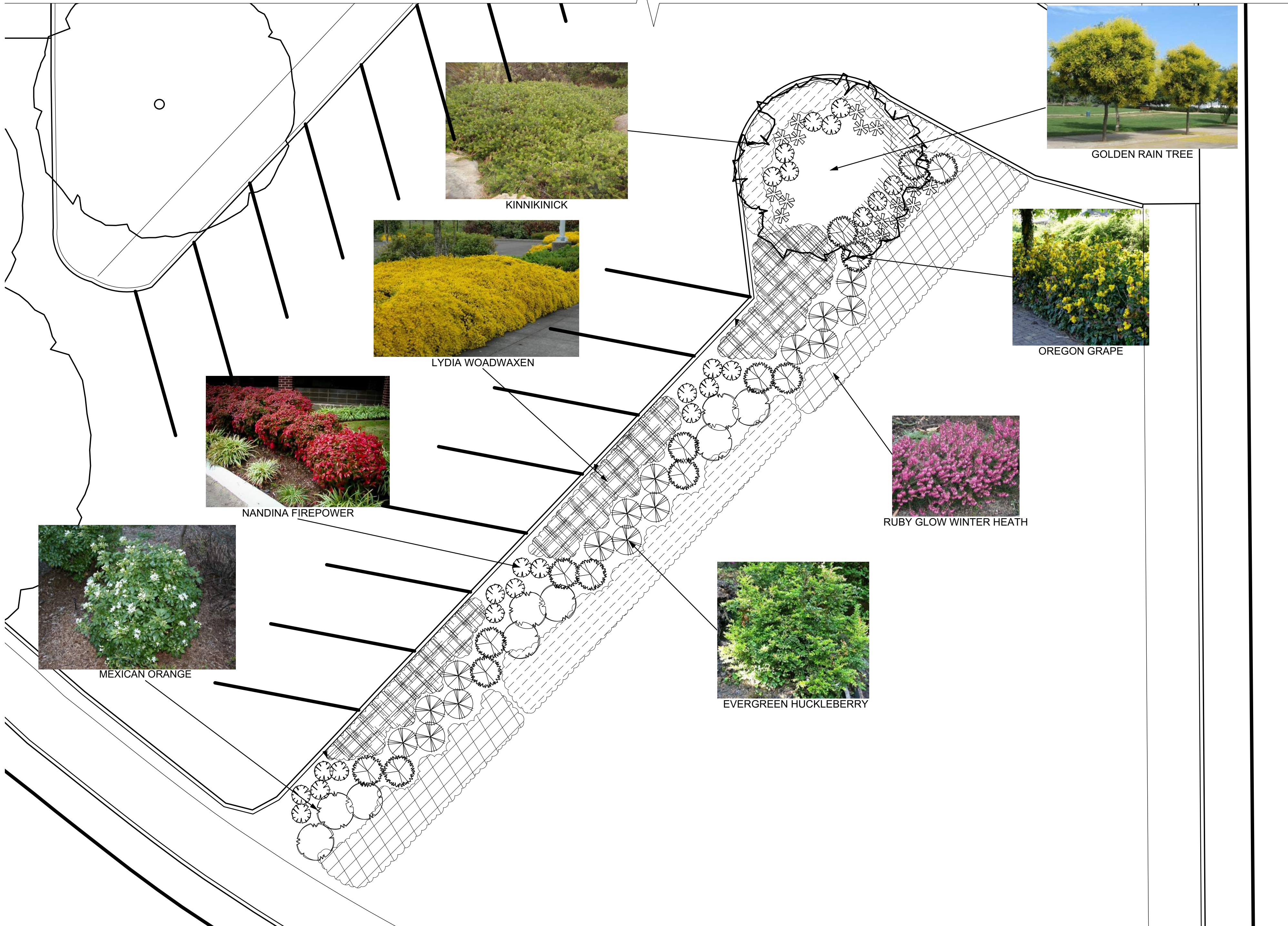


NOTES:

1. GROUND COVER TO ACHIEVE 100% COVERAGE WITHIN 3 YEARS. CONTRACTOR TO EVALUATE PLANT COVERAGE AFTER 1 YEAR IN ORDER TO DETERMINE IF ADDITIONAL PLANTINGS WILL BE REQUIRED.
2. NO BARK MULCH SHALL BE ALLOWED EXCEPT UNDER THE CANOPY OF SHRUBS AND WITHIN 2 FEET OF THE BASE OF TREES.



1 BUILDING PLANTING PLAN
Scale: 1/8" = 1'-0"



2 PARKING LOT PLANTING PLAN
Scale: 1/8" = 1'-0"



KOBUS MAGNOLIA



CREEPING MAHONIA



FOERSTER'S FEATHER REED GRASS



EASTERN REDBUD

Plant List - Types	ID	Qty	Common Name	Botanical Name	Scheduled Size	Comments
Groundcover						
	ARUU	156	Kinnikinnick	Arctostaphylos uva-ursi 'Emerald Carpet'	4" POT	PLANT 36" O.C.
	GELY	40	Lydia Woodwaxen	Genista lydia	4" POT	PLANT 36" O.C.
	ERRG	102	Ruby Glow Winter Heath	Erica carnea 'Ruby Glow'	4" POT	PLANT 24" O.C.
Ornamental Grass						
	PEAL	33	Dwarf Fountain Grass	Pennisetum alopecuroides 'Hameln'	1 GAL.	
	CAAC	8	Foerster's Feather Reed Grass	Calamagrostis x acutiflora 'Karl Foerster'	1 GAL.	
	FEID	26	Idaho Fescue 'Siskiyou Blue'	Festuca idahoensis 'siskiyou blue'	1 GAL.	
Perennials						
	ERSP	25	Showy Fleabane	Erigeron speciosus	1 GAL.	
Shrubs						
	ILCO	5	Carissa Holly	Ilex cornuta 'Carissa' P.P.# 3187	5 Gal.	
	MARE	41	Creeping Mahonia	Mahonia repens	1 GAL.	
	VIDA	26	David Viburnum	Viburnum davidii	1 GAL.	
	VAOV	15	Evergreen Huckleberry	Vaccinium ovatum	5 GAL.	
	NAFI	34	Firepower Heavenly Bamboo	Nandina domestica 'Firepower'	1 GAL.	
	CHTE	9	Mexican Orange Blossom	Choisya ternata	5 GAL.	
	MAAQ	14	Oregon Grape	Mahonia aquifolium	5 GAL.	
	NADO	1	Plum Passion Heavenly Bamboo (TM)	Nandina domestica 'Plum Passion' (TM)	5 GAL.	
Trees						
	CECA	2	Eastern Redbud	Cercis canadensis	2" CALIPER	
	KOPA	1	Golden Rain Tree	Koelreuteria paniculata	2" CALIPER	
	MAKO	1	Kobus Magnolia	Magnolia kobus	2" CALIPER	

NOTES:

- GROUND COVER TO ACHIEVE 100% COVERAGE WITHIN 3 YEARS. CONTRACTOR TO EVALUATE PLANT COVERAGE AFTER 1 YEAR IN ORDER TO DETERMINE IF ADDITIONAL PLANTINGS WILL BE REQUIRED.
- NO BARK MULCH SHALL BE ALLOWED EXCEPT UNDER THE CANOPY OF SHRUBS AND WITHIN 2 FEET OF THE BASE OF TREES.

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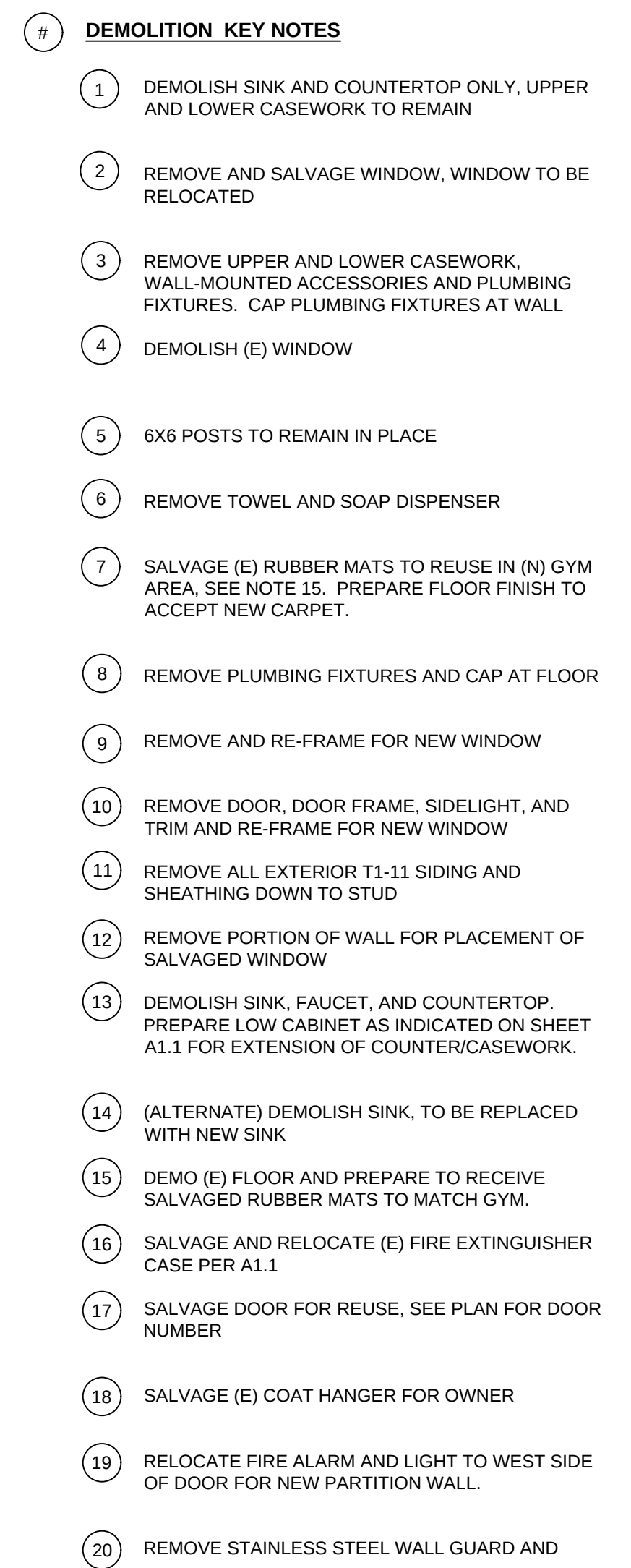


PROJECT NO: P-2195-17
DRAWN: JML
CHECKED: GTC
DATE: 08-08-17



PLANTING
PLAN W/
IMAGES

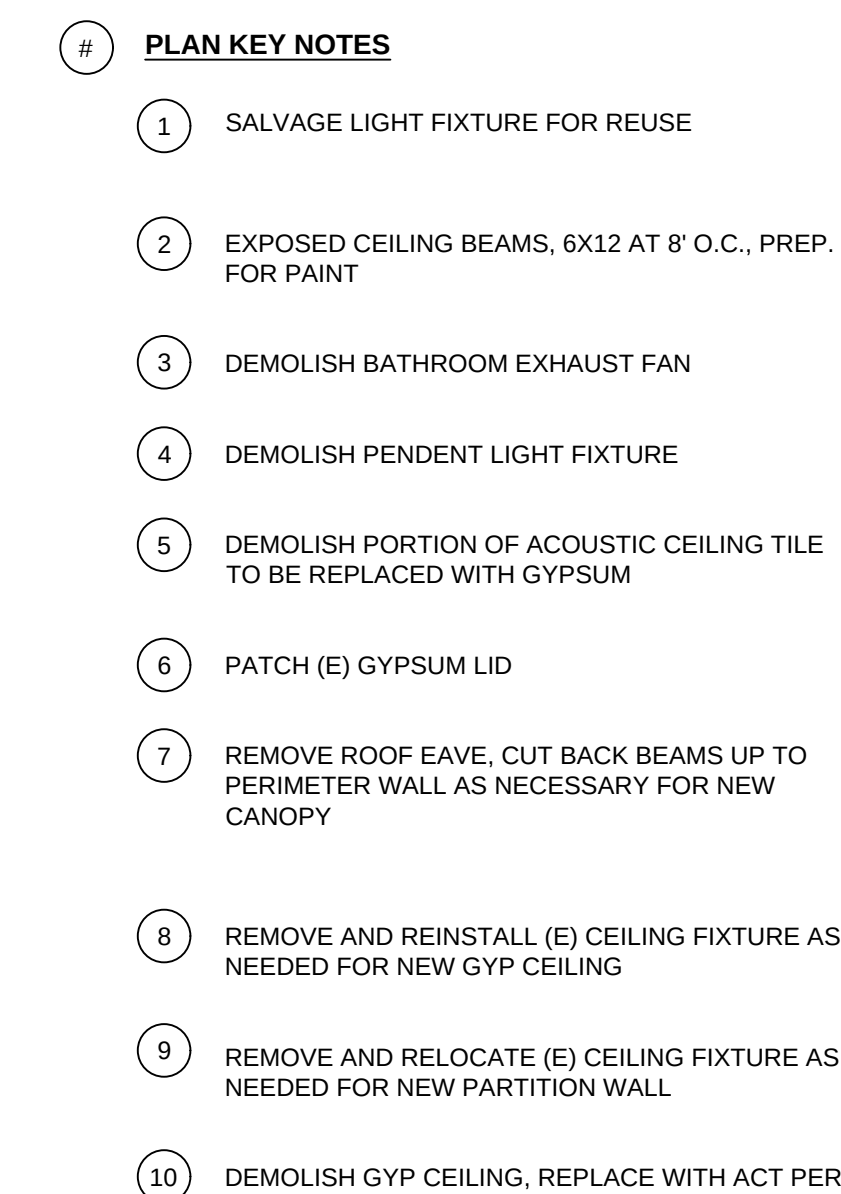
L1.1



	EXISTING WALLS/PARTITIONS TO REMAIN
	PARTITION/ELEMENT TO BE REMOVED
	NO WORK IN THIS AREA
	ROOF OVERHANG

1. REMOVE ALL EXISTING CONSTRUCTION AND FINISHES NECESSARY FOR THE COMPLETION OF THE WORK AS DEPICTED ON THE DRAWINGS, INCLUDING BUT NOT LIMITED TO, ITEMS SHOWN ON THE PLANS WITH DASHED LINES. NECESSARY DISCONNECTS AND ALTERATIONS TO EXISTING MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INCLUDED. PATCH AS REQUIRED ALL CONSTRUCTION TO REMAIN IN ACCORDANCE WITH THE CONTRACT DRAWINGS. WHERE CONTRACTOR IS DESIGNATED TO MAKE REMOVAL, DISPOSITION OF MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR IN CONSULTATION WITH OWNER. THE DISPOSITION AND REMOVAL OF ANY COMPONENTS OF SALVAGEABLE VALUE.

2. ALL REMOVALS AND SALVAGE, UNLESS SPECIFICALLY NOTED OR REQUESTED BY THE OWNER SHALL BECOME THE PROPERTY OF THE CONTRACTOR.
3. REMOVE ONLY NONLOAD BEARING CONSTRUCTION AND PARTITIONS. CONTRACTOR TO VERIFY, PRIOR TO REMOVAL, THE NON STRUCTURAL COMPONENTS, I.E. BEARING WALLS, BEAMS, HEADERS, ETC. SUPPORTING FLOOR, ROOF OR CEILING JOISTS ARE DEGRADED TO THE POINT OF REMOVAL. CONTRACTOR THE ARCHITECT PRIOR TO REMOVAL OF ANY CONSTRUCTION
4. ALL STRUCTURAL SYSTEMS SHALL BE MAINTAINED AND SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT THE DESIGN LOADS AND TO RESIST THE DEFORMATION CAUSED BY THE DESIGN LOADS TO WHICH THEY ARE SUB. PRESSURE INCLUDING SURCHARGE, HYDROSTATIC HEAD AND IMPACT LOADS AS APPLICABLE. MINIMUM DESIGN LOAD VALUES SHALL BE AS FOLLOWS:
40 P.S.F. LIVE LOAD (FIRST FLOOR)
25 P.S.F. LIVE LOAD (SNOW)
15 P.S.F. DEAD LOAD (CEILING/ROOF)
EXCESSIVE ALLOWABLE DEFLECTION AT 1/360 OF SPAN
5. PATCH EXISTING WALLS, GYPSUM DRYWALL OR PLASTER TO MATCH EXISTING WITH SUFFICIENT LAYERS TO MAINTAIN UNIFORM WALL THICKNESS.
6. WHERE APPLICABLE LEVEL ALL EXISTING FLOORS AS REQUIRED TO RECEIVE NEW FLOOR FINISHES.
ALL PATCH REQUIRED TO MATCH EXISTING BETWEEN VARIOUS FLOOR FINISHES SUITABLE FOR CONDITIONS AND ACCEPTABLE TO THE OWNER.
MATCH EXISTING WHEREVER POSSIBLE.
7. REUSE EXISTING DOORS, DOOR FRAMES AND DOOR HARDWARE IN NEW CONFIGURATION WHENEVER POSSIBLE. NEW DOORS AND DOOR FRAMES TO MATCH EXISTING.
8. SALVAGE AND RELOCATE ALL FIRE ALARMS, FIRE ALARM STROBES, MOTION SENSORS, AND SPEAKERS LOCATED ON DEMOLISHED WALLS
9. SALVAGE ALL CORNER GUARDS, BULLETIN BOARDS AND WHITE BOARDS FOR OWNER
10. SALVAGE ALL STAINLESS STEEL SWITCH PLATES AND OUTLETS FOR REUSE



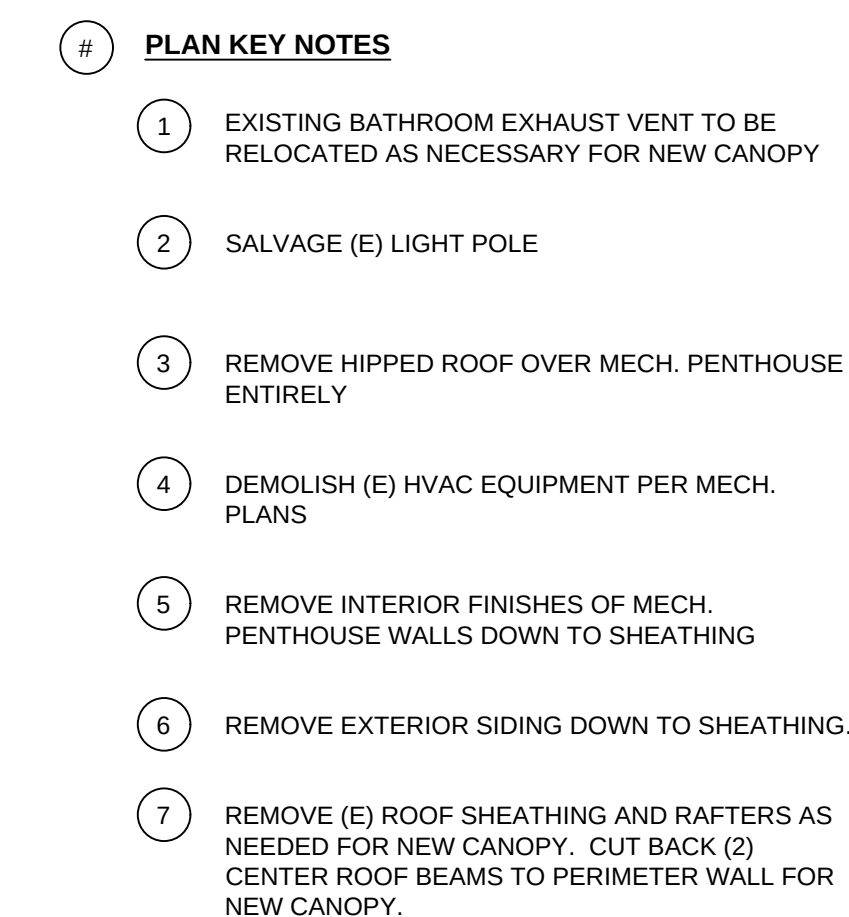
NO WORK IN THIS AREA

GYPSUM BOARD

ACOUSTIC CEILING TILE 2X4

LIGHT FIXTURES TO BE REMOVED

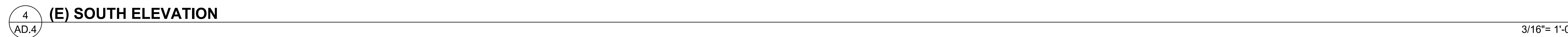
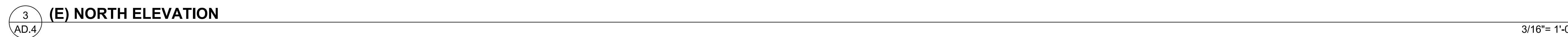
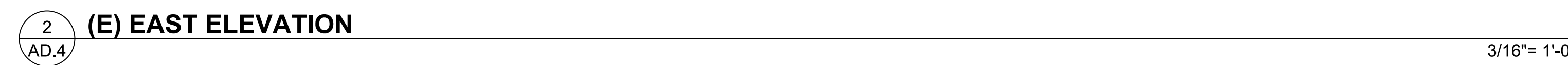
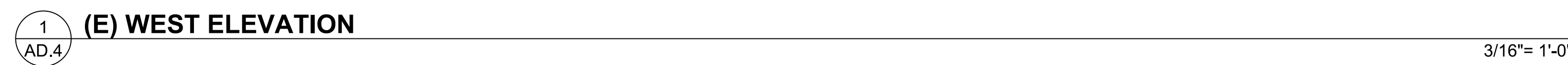
1. ALL CEILING FIXTURES TO REMAIN UNLESS OTHERWISE NOTED
2. SALVAGE DEMOLISHED LIGHTING AND DIFFUSERS AS INDICATED
3. EXIT SIGNS TO REMAIN
4. DEMOLISH EXPOSED DUCTWORK AND AIR INTAKE DUCTING AT WALL, SEE MECHANICAL DEMO. SHEET
5. (E) 2X4 ACT TO REMAIN, DAMAGED TILES TO BE REPLACED BETWEEN (E) ROOF RAFTERS

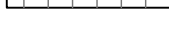


PERIMETER OF EXTERIOR WALL BELOW

DEMOLISH (E) SINGLE-PLY ROOFING

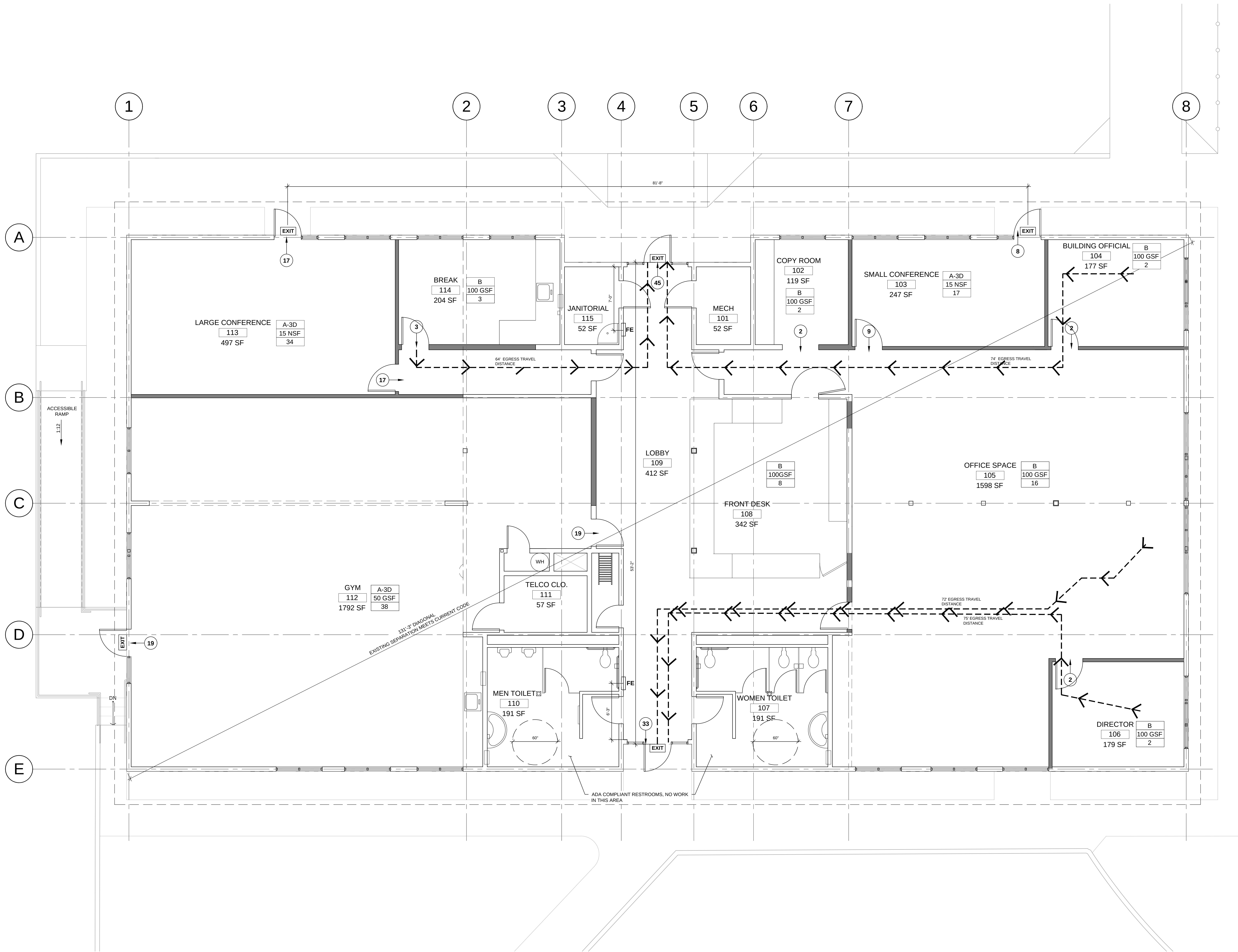
1. REMOVE SINGLE-PLY ROOFING ASSEMBLY THROUGHOUT DOWN TO (E) SHEATHING
2. DEMOLISH ALL EXISTING ROOF VENTS AND PATCH
3. DEMOLISH ALL SOFFITS
4. DEMOLISH ALL GUTTERS AND DOWNSPOUTS



- LEGEND**
-  T1-11 SIDING TO BE DEMOLISHED
-  ROOFING TO BE DEMOLISHED
-  INDICATES ELEMENT TO BE DEMOLISHED

PLAN GENERAL NOTES

1. SALVAGE DEMOLISHED WINDOWS FOR RE-USE, SEE DEMOLITION PLAN



LEGEND

- EMERGENCY EXIT ROUTE
- ILLUMINATED EXIT SIGN PER OSSC SECTION 1011.
- FIRE EXTINGUISHER
- EXISTING WALLS/PARTITIONS TO REMAIN
- NEW WALL/PARTITION
- OCCUPANT LOAD EXITING
- OCC. TYPE
- OCC. LOAD FACTOR PER TABLE 1004.1.2
- OCC. LOAD

CODE REVIEW

OPEN OFFICE/LOBBY/FRONT DESK/BREAK/COPY:
OCCUPANCY/FUNCTION: BUSINESS (100 GSFOCC)
WORK AREA: 2,845 SF
GROSS FLOOR AREA: 3,031 SF
OCCUPANT LOAD: 33

LARGE CONFERENCE:
OCCUPANCY/FUNCTION: A-3/DIASSEMBLY (15 NSF/OCC)
WORK AREA: 498 SF
GROSS FLOOR AREA: 539 SF
OCCUPANT LOAD: 34

SMALL CONFERENCE:
OCCUPANCY/FUNCTION: A-3/DIASSEMBLY (15 NSF/OCC)
WORK AREA: 247 SF
GROSS FLOOR AREA: 276 SF
OCCUPANT LOAD: 17

GYM:
OCCUPANCY/FUNCTION: A-3/DIEXERSIZE (50 GSFOCC)
WORK AREA: 1,763 SF
GROSS FLOOR AREA: 1,893 SF
OCCUPANT LOAD: 38

TOTAL OCCUPANT LOAD= 122

SPRINKLERS: NOT PROVIDED
FIRE ALARM: PROVIDED

PER TABLE 1014.3 COMMON PATH OF EGRESS TRAVEL:
FOR 'A' & 'B' OCCUPANCY WITH MORE THAN 30
OCCUPANTS = 75 FT.

PER SECTION 1015.2.1 TWO EXITS OR EXIT ACCESS
DOORWAYS. WHERE TWO EXITS OR EXIT ACCESS
DOORWAYS ARE REQUIRED FROM ANY PORTION OF THE
EXIT ACCESS, THE EXIT DOORS OR EXIT ACCESS
DOORWAYS SHALL BE PLACED A DISTANCE APART EQUAL
TO NOT LESS THAN ONE-HALF OF THE LENGTH OF THE
MAXIMUM OVERALL DIAGONAL DIMENSION OF THE
BUILDING OR AREA TO BE SERVED MEASURED IN A
STRAIGHT LINE BETWEEN EXIT DOORS OR EXIT ACCESS
DOORWAYS.

PLUMBING FIXTURES

PER TABLE 2002.1 MINIMUM NUMBER OF REQUIRED
PLUMBING FIXTURES:

AREA	OCC TYPE	OCCUP- ANTS		FIXTURES REQUIRED			FIXTURES PROVIDED		
		M	F	M	F	LAV	M	F	LAV
3,031	B	17	17	1	1	1	4/3*	2	1
2,688	A	45	45	1	1	1	1	1	1

*PER TABLE 2002.1 URINALS MAY REPLACE WATER
CLOSETS AT A RATIO OF 1 URINAL PER 2/3 WATER CLOSET

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ZCS
ENGINEERING

254 Main Street - Suite 02, Oregon City, OR 97045
(503) 666-0001

PROJECT NO: P-2195-17

DRAWN: MJC

CHECKED: JCH

DATE: 10-19-17

REGISTERED ARCHITECT

JOELLE HUBBARD

KLAMATH FALLS, OR

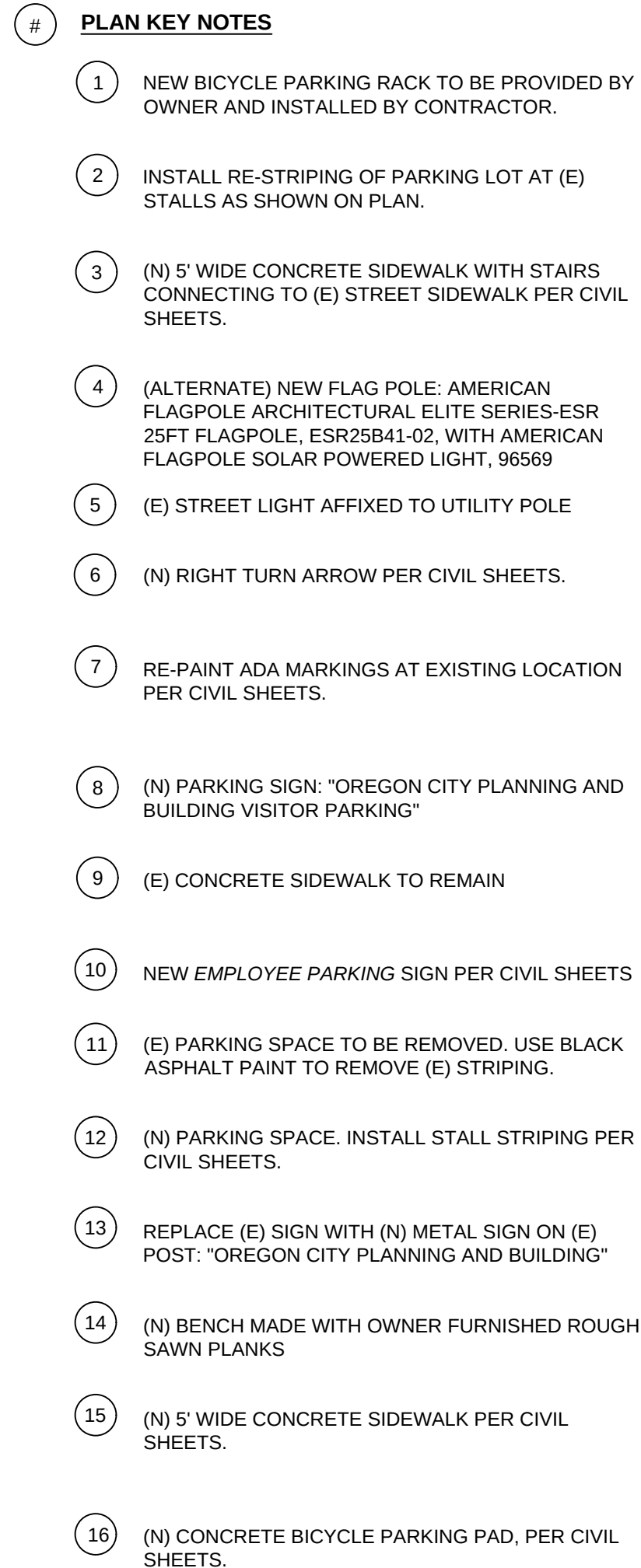
STATE OF OREGON

EXPIRES: 12-31-17

CODE/EGRESS PLAN

A0.1

ISSUED FOR PERMIT/BID



 CHAIN LINK FENCING

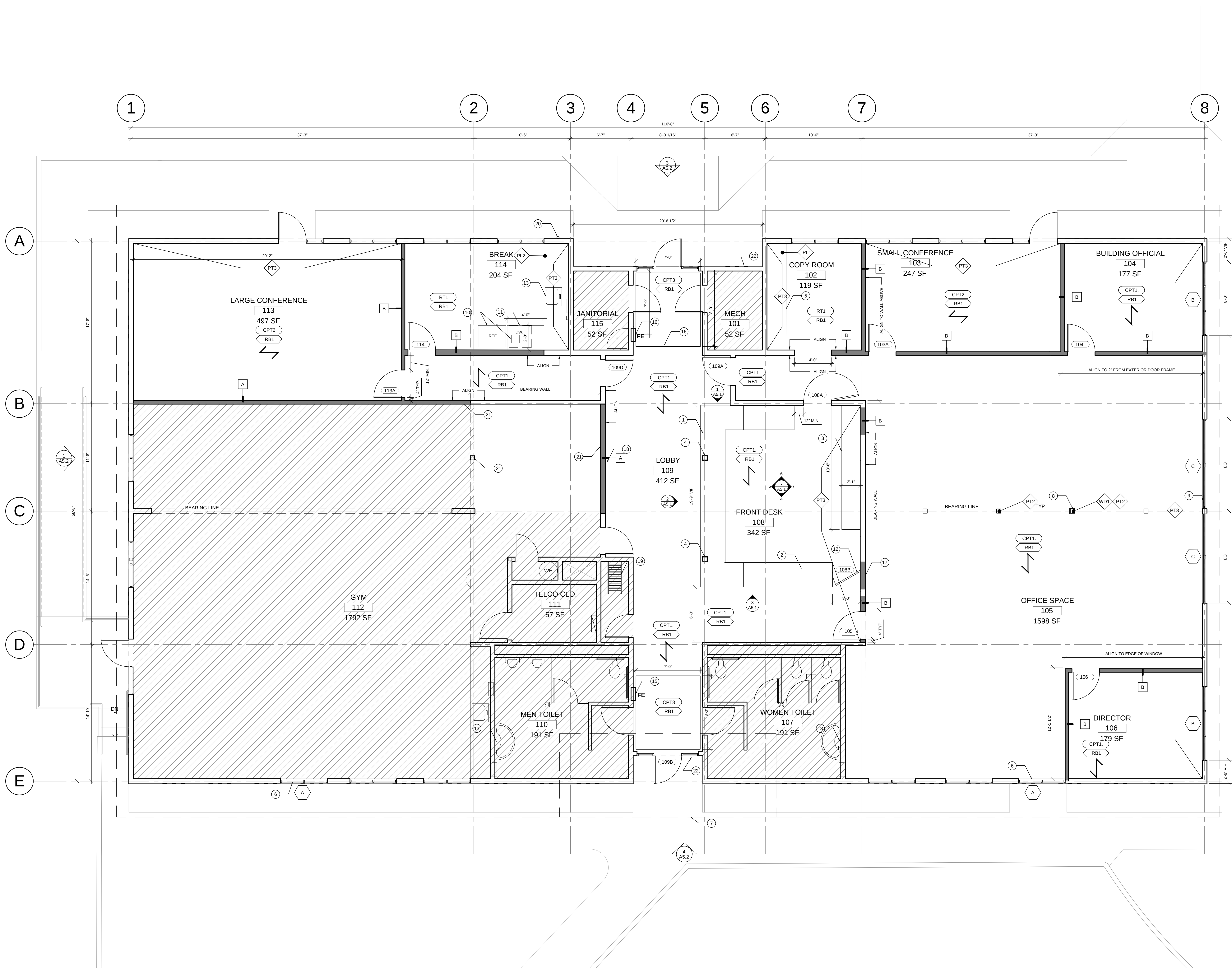
 SIDEWALK REPLACEMENT AREA

 LANDSCAPE IMPROVEMENTS, SEE SHEET L.1.0 FOR LANDSCAPE PLAN

 TRAFFIC BOLLARD

 (E) TREE

1. ALL DIMENSIONS ARE APPROXIMATE.
2. LANDSCAPE IMPROVEMENTS TO BE VERIFIED WITH ARCHITECT.
3. SIDEWALK IMPROVEMENTS TO BE VERIFIED BY ARCHITECT.
3. BICYCLE RACKS WILL BE PROVIDED BY THE CLIENT AND INSTALLED BY THE GENERAL CONTRACTOR.
4. ALL (N) LANDSCAPING TO RECEIVE IRRIGATION, TRENCH IRRIGATION ACROSS PARKING LOT AND PATCH ASPHALT WHERE NECESSARY. SEE SPECIFICATIONS.



- PLAN KEY NOTES**
- NEW CASEWORK: 42" COUNTER WITH P-LAM SURFACE. SEE SHEET A5.1
 - ADA ACCESSIBLE CASEWORK AND COUNTER
 - NEW CASEWORK AND COUNTER, SEE SHEET A5.1
 - (E) POST TO BE TRIMMED OUT ABOVE NEW COUNTER WITH 1X CEDAR WITH MITERED CORNERS. SEE SHEET A5.1
 - (E) CASEWORK WITH PLUMBING FIXTURES REMOVED AND (N) P. LAM. COUNTERTOPS.
 - SALVAGED AND REINSTALLED NAIL FIN ALUMINUM WINDOW
 - NEW ENTRY CANOPY
 - EXISTING POST TRIMMED OUT ABOVE NEW COUNTER WITH 1X CEDAR WITH MITERED CORNERS. TO A HEIGHT OF 67". POST BASE TO BE RB1. SEE FINISH SCHEDULE (POST TO BE PAINTED PT2 ABOVE CEDAR TRIM)
 - NEW WINDOW FRAMING PER STRUCTURAL SHEET
 - NEW WATER LINE FOR OFCI REFRIGERATOR AND COFFEE MAKER
 - NEW CASEWORK AND COUNTERTOPS. NEW PLUMBING FOR OFCI DISHWASHER
 - HALF-DOOR PANEL WITH 180 DEGREE SWING. MATCHING P-LAM FINISH
 - MODIFIED CASEWORK: NEW P-LAM COUNTERTOP WITH 4" BACKSPLASH ON EXISTING CASEWORK WITH NEW SS TOP MOUNT SINK: ELKAY CELEBRITY 28" X 21-1/4" X 5-3/8" DEEP. GEOR2821MR2 & FAUCET. CONCRETE TO THREE-HOLE BASIN MIXER 1/2" L-SIZE. 2021700A AND GARBAGE DISPOSAL.
 - ALTERNATE: REMOVE EXISTING HAND SINK IN BOTH TOILETS AND REPLACE WITH AMERICAN STANDARD DXV LYDON 47 INCH WALL-HUNG TROUGH SINK. INCLUDE TWO FAUCETS (DXV AMERICAN STANDARD LYDON SINGLE HANDLE BATHROOM FAUCET, SANIWRAP AT PIPING, AND SOME ADDITIONAL TILE PATCHING (DAL TILE, 2X2 MATTE MOSAIC)
 - (E) FIRE EXTINGUISHER CASE. CONTRACTOR TO PROVIDE NEW FIRE EXTINGUISHER
 - RELOCATED FIRE EXTINGUISHER CASE WITH NEW FIRE EXTINGUISHER
 - INFILL (E) DOOR
 - (N) OFCI TILE ART WORK, PROVIDE BLOCKING IN WALL FOR ATTACHMENT
 - (E) MECHANICAL ROOM ACCESS LADDER TO REMAIN.
 - (N) 3" PVC DRAIN PIPE TO EXIST ATTIC SPACE AND RUN VERTICALLY TO BELOW GRADE. SEE SHEET A5.2 FOR EXIT LOCATION
 - PAINT TO MATCH (E) GYM. ADD EXTRA LAYER OF 5/8 GWB TO WALLS (3 LAYERS TOTAL)
 - OFCI BOOT SCRUBBER

LEGEND

- EXISTING WALLS/PARTITIONS TO REMAIN
- NEW PARTITION
- ROOF OVERHANG
- NO WORK IN THIS AREA
- WINDOW TYPE
- WALL TYPE
- FIRE EXTINGUISHER

FINISH LEGEND

- ROOM TAG
- ROOM NAME
- ROOM NUMBER
- FLOOR FINISH
- WALL BASE
- DIRECTION OF CARPET PATTERN
- FINISH TAG

PLAN GENERAL NOTES

- ALL DIMENSIONS ARE TO FACE OF FINISH UNLESS NOTED OTHERWISE.
- TRANSITION OF FLOORING MATERIALS TO OCCUR UNDER DOOR SLAB UNLESS OTHERWISE NOTED.
- ALL INTERIOR WALL SURFACES WITHIN AREA OF WORK TO RECEIVE PAINT. SEE FINISH SCHEDULE
- EXISTING CEILING BEAMS AND ACT TO BE PAINTED IN OPEN OFFICE SPACE AND VISIBLE AREAS OF LARGE CONFERENCE ROOM. SEE FINISH SCHEDULE
- ALL DOOR FRAMES WITHIN AREAS OF WORK TO RECEIVE PAINT. MATCH ADJACENT WALL COLORS
- MATCH (E) P-LAM SILL AT NEW WINDOWS.
- REPLACE WALL INSULATION IF EXISTING IS DETERIORATING, SAGGING, NOT FILLING STUD, OR NON-CODE COMPLIANT.

WALL PARTITION SCHEDULE

- FULL HEIGHT NON-RATED PARTITION 2X6 WOOD STUD @ 16" OC, 5/8" GWB ON BOTH SIDES, ACOUSTIC BATT INSULATION ENTIRE CAVITY, CONTINUOUS ACOUSTIC SEALANT AT BASE AND TOP OF WALL.
- FULL HEIGHT NON-RATED 2X4 WOOD STUD STAGGERED TO MATCH (E) WALL THICKNESS WHERE NECESSARY, 5/8" GWB BOTH SIDES, ACOUSTIC BATT INSULATION ENTIRE CAVITY, CONTINUOUS ACOUSTIC SEALANT AT BASE AND TOP OF WALL.

CITY OF OREGON CITY
COMMUNITY DEVELOPMENT DEPT. TI
1232 LINN AVE OREGON CITY 97045

ENGINEERING
254 Main Street - Suite 02, Oregon City, OR 97045
503.656.0000

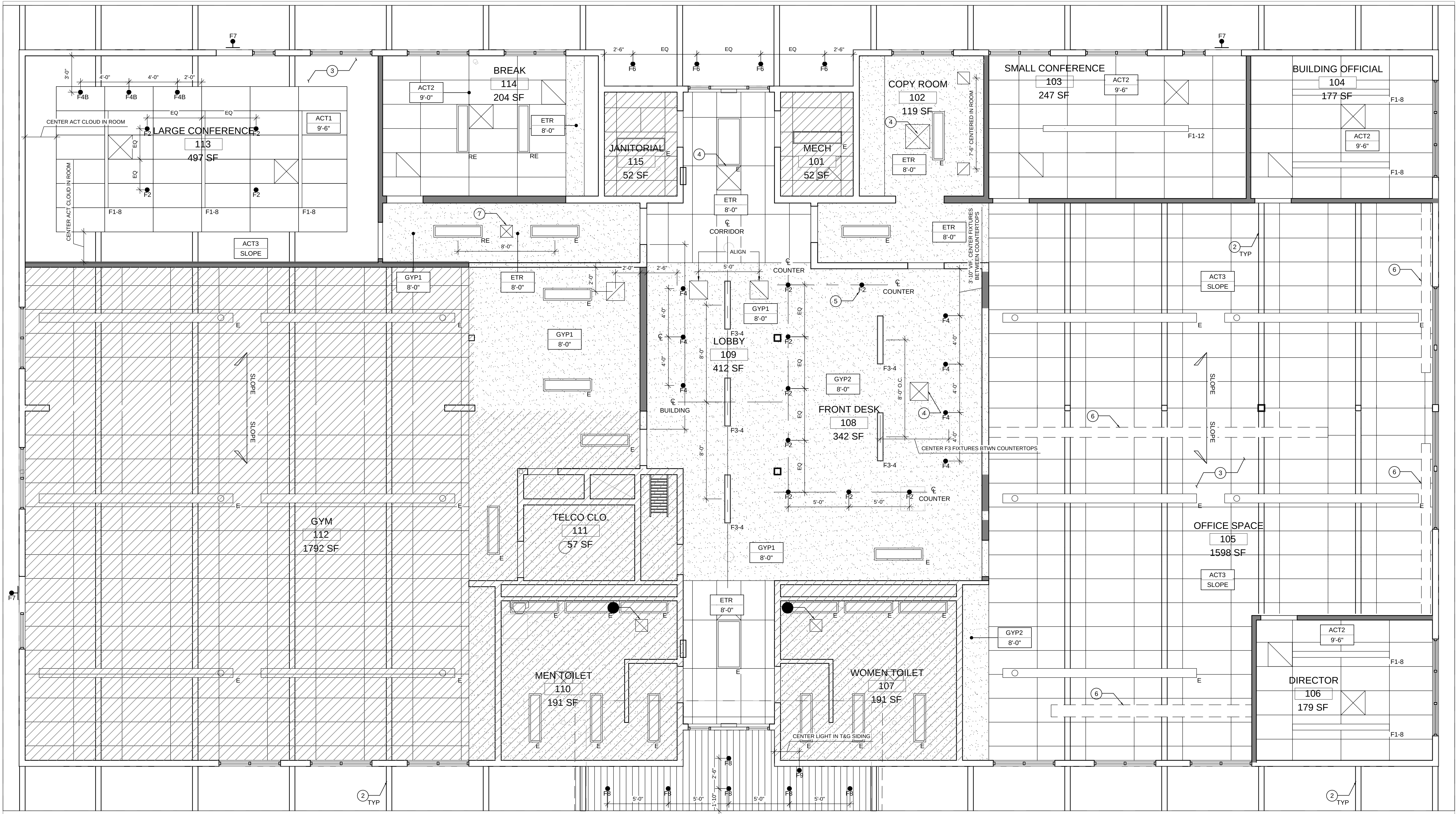
REGISTERED ARCHITECT
JOLLE HUBBARD
KLAMATH FALLS, OR
STATE OF OREGON
EXPIRES: 12-31-17

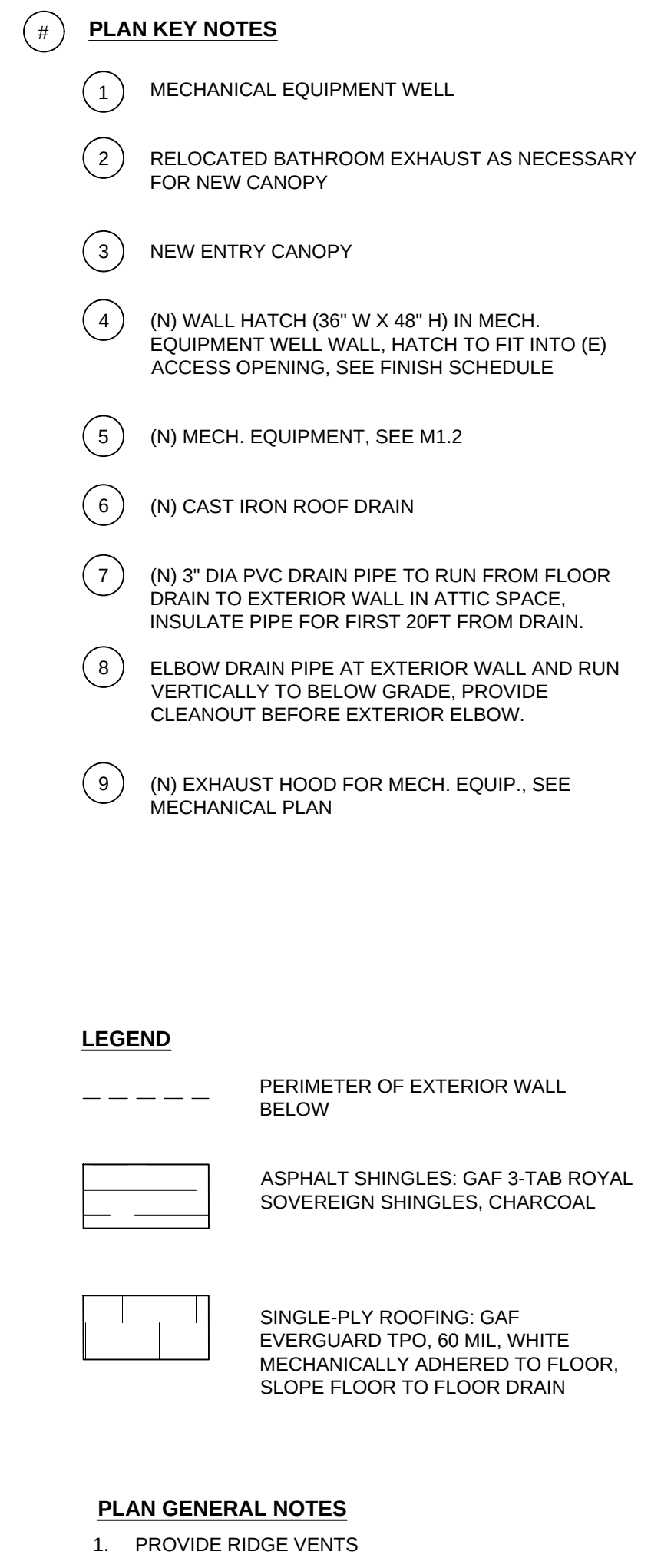
PROJECT NO: P-2195-17
DRAWN: MJC
CHECKED: JCH
DATE: 10-19-17

FLOOR PLAN

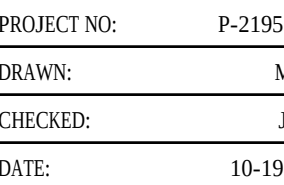
A1.1

ISSUED FOR PERMIT/BID





COMMUNITY DEVELOPMENT DEPT. TI
1232 LINN AVE OREGON CITY 97045



EXPIRES: 12-31-1

A1.3

DOOR NO.	ROOM NAME	ROOM NO.	DOOR HEIGHT	DOOR WIDTH	DOOR TYPE	DOOR MATERIAL	DOOR FINISH	FRAME MATERIAL	FIRE RATING	COMMENTS
103A	SMALL CONFERENCE	103	7'-0"	3'-0"	C	WD/TG	CF	HM	-	PASSAGE FUNCTION LOCKSET, ACOUSTICAL GASKETING
104	BUILDING OFFICIAL	104	7'-0"	3'-0"	C	WD/TG	CF	HM	-	OFFICE FUNCTION LOCKSET, ACOUSTICAL GASKETING
105	FRONT LOBBY	105	7'-0"	3'-0"	A	WD/TG	CF	HM	-	CLASSROOM FUNCTION LOCKSET, CARD READER, DOOR CLOSER, AND KICK PLATE
106	DIRECTOR	106	7'-0"	3'-0"	C	WD/TG	CF	HM	-	OFFICE FUNCTION LOCK SET, ACOUSTICAL GASKETING
108A	FRONT DESK	108	EX	EX	B	EX	EX	HM	-	RELOCATED (E) DOOR AND DOOR FRAME, PROVIDE NEW LEVER LOCKSET, CARD READER, MAGNETIC DOOR HOLDER
108B	FRONT DESK	108	3'-6"	3'-0"	-	WD	CF	WD	-	DOUBLE SWING HALF DOOR TO MATCH NEW CASEWORK, PROVIDE CONTINUOUS HINGE
109A	LOBBY	109				ETR				PROVIDE CARD READER
109B	LOBBY	109				ETR				PROVIDE CARD READER, REPLACE EXISTING SIMPLEX LOCKSET WITH SCHLAGE LEVER LOCKSET, PROVIDE STAINLESS STEEL PLATE TO COVER PRIOR LOCKSET HOLES
109D	LOBBY	109				ETR				PROVIDE CARD READER
113A	LARGE CONFERENCE	113	7'-0"	3'-0"	C	WD/TG	CF	HM	-	PASSAGE FUNCTION, ACOUSTICAL GASKETING
114	BREAK	114	EX	EX	B	EX	EX	HM	-	RELOCATED EXISTING DOOR AND DOOR FRAME, PROVIDE DOOR HOLD OPEN KICK

A
(E) WOOD DOOR WITH GLAZED PANEL

B
(E) WOOD DOOR

C
WOOD DOOR WITH GLAZED PANEL

1. ALL DOORS & HARDWARE NOT LISTED IN SCHEDULE ARE EXISTING TO REMAIN.
2. ALL EXIT DOORS SHALL BE OPENABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.
3. ALL NEW DOORS TO HAVE HALF DOME FLOOR STOPS IN MATCHING FINISH.
4. PROVIDE DOOR SILENCERS ON ALL NEW DOORS.
5. NEW DOOR HARDWARE TO MATCH EXISTING DOORS, SCHLAGE FALCON W SERIES IN BRUSHED NICKEL OR EQUAL.
6. ASSUME ALL EXISTING DOORS TO BE RE-KEYED.

EX	EXISTING
ETR	EXISTING TO REMAIN
AL	ALUMINUM
STL	STEEL
CAA	CLEAR ANODIZED ALUMINUM
BRZ	DARK BRONZE ANODIZED ALUMINUM
CF	CLEAR FINISHED WOOD
HM	HOLLOW METAL
PT	PAINTED FINISH
PG	PAINT GRADE WOOD
SG	TEMPERED GLASS
TC	SOLID CORE
STRFT	ALUMINUM STOREFRONT
WNDW	WINDOW

Architectural drawing of a window unit. The drawing shows a cross-section of a window with two panes. The overall width is labeled as 5'-0" VF. The overall height is labeled as 4'-6" VF. The height of the lower pane is labeled as 1'-3" VF. The height of the lower pane is also labeled as 2'-6" VF. The drawing includes labels for the window panes: EQ, EQ, and EQ. The drawing is labeled T.O. FINISH FLOOR.

8'-0"

1'-11" MATCH EXISTING

EQ EQ EQ

T.O. FINISH FLOOR

Architectural elevation drawing of a window wall. The drawing shows a wall with two large rectangular windows and two smaller triangular windows below them. Dimensions are provided for the overall height (10'-0"), individual window heights (9", 1'-10", 3'-10"), and match lines (2'-6" MATCH EXISTING, 1'-3" MATCH EXISTING). The base is labeled "T.O. FINISH FLOOR" and "EQ" (Equal) for the two triangular windows. A north arrow is located at the bottom right.

FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	STYLE/COLOR	SIZE/TUFTED WEIGHT/BACKING	INSTALLATION NOTES
CPT1	CARPET TILE	OFFICES, OPEN OFFICE, LOBBY, FRONT DESK, CORRIDORS	MILIKEN	ARCADIA, UNDERCURRENT "VERDANT" UNF71-101	25CM X 1M PLANKS, CUSHION BACK	ASHLAR PATTERN, RUN LONG DIRECTION OF ROOM, SEE PLANS FOR MORE INFORMATION
CPT2	CARPET TILE	CONFERENCE ROOMS	MILIKEN	ARCADIA, SHORELINE "VERDANT" SHF71-101	25CM X 1M PLANKS, CUSHION BACK	ASHLAR PATTERN, RUN LONG DIRECTION OF ROOM
CPT3	CARPET TILE	WALK-OFF MAT	MILIKEN		7' X 8'	
RT1	RUBBER TILE	BREAK ROOM/COPY ROOM	MANNINGTON	SPANISH MESA	17.5IN X 17.5IN, RUBBER BASE	

FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	STYLE/COLOR	SIZE/THICKNESS	INSTALLATION NOTES
RB1	RUBBER BASE	THROUGHOUT	ROPPE	TBD	4" X 1/8"	TOELESS BASE AT CARPETED AREAS, COVE BASE AT RESILIENT FLOOR

FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	COLOR	FINISH	INSTALLATION NOTES
PT1	PAINT	INTERIOR WALLS, DOOR & WINDOW FRAMES	SHERWIN WILLIAMS	MUSLIN SW 6133	WALLS: EGGSHELL, DOOR & WINDOW FRAMES: SEMI-GLOSS	PAINT CEILING TILES & GRID IN OPEN OFFICE SPACE.
PT2	PAINT	INTERIOR CEILING RAFTERS & EXPOSED POSTS	SHERWIN WILLIAMS	PORTABELLO SW6102	SATIN	
PT3	PAINT	ACCENT WALL WHERE INDICATED	SHERWIN WILLIAMS	OYSTER BAY SW 6206	EGGSHELL	
PT4	PAINT	EXISTING CEILING TILES BETWEEN ROOF RAFTERS AND GWS CEILINGS	SHERWIN WILLIAMS	IVORY LACE SW 7013	FLAT	
PT5	PAINT	EXTERIOR CEMENT PANELS & SIDING, HOLLOW METAL DOORS AND DOOR FRAMES	SHERWIN WILLIAMS	GRIZZLY GRAY SW 7068	SATIN	
PT6	PAINT	EXTERIOR RAFTER TAILS, FASCIA BOARDS, GUTTERS & DOWNSPOUTS	BENJAMIN MOORE	STONE BROWN 2112-30	SATIN	
PT7	WOOD STAIN	CEDAR TRIM ON INTERIOR POSTS, EXTERIOR CEDAR SIDING	MINWAX	IPSWICH PINE	SEAL WITH POLYURETHANE SEMI-GLOSS	

FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	COLOR	INSTALLATION NOTES
PL1	PLASTIC LAMINATE	BREAK AND COPY ROOM COUNTER TOPS AND BACKSPLASH	WILSONART	CANYON ZEPHYR 4842-60	1 1/2" COUNTERTOP; SQUARE EDGE
PL2	PLASTIC LAMINATE	NEW WINDOW SILLS & BREAK ROOM: VERTICAL SURFACES	WILSONART	SPICED ZEPHYR 4859-60	NEW CASEWORK SURROUND AT DISHWASHER. MATCH EXISTING WINDOW SILL DIMENSIONS
PL3	PLASTIC LAMINATE	FRONT DESK: COUNTERTOP	NEVAMAR	FOUNDRY S2084T	1 1/2" COUNTERTOP; 1/4" TOP-ROUND EDGE
PL4	PLASTIC LAMINATE	FRONT DESK: DRAWER/DOOR FRONTS & DECORATIVE FRONT SURFACE	WILSONART	MONTICELLO MAPLE 7925-38	
WD1	WOOD: CLEAR CEDAR	BASE OF EXPOSED POSTS AT FRONT DESK AND OPEN OFFICE	-	STAIN AND SEAL WITH POLYURETHANE, SEMI-GLOSS	SEE FLOOR PLANS FOR EXTENT

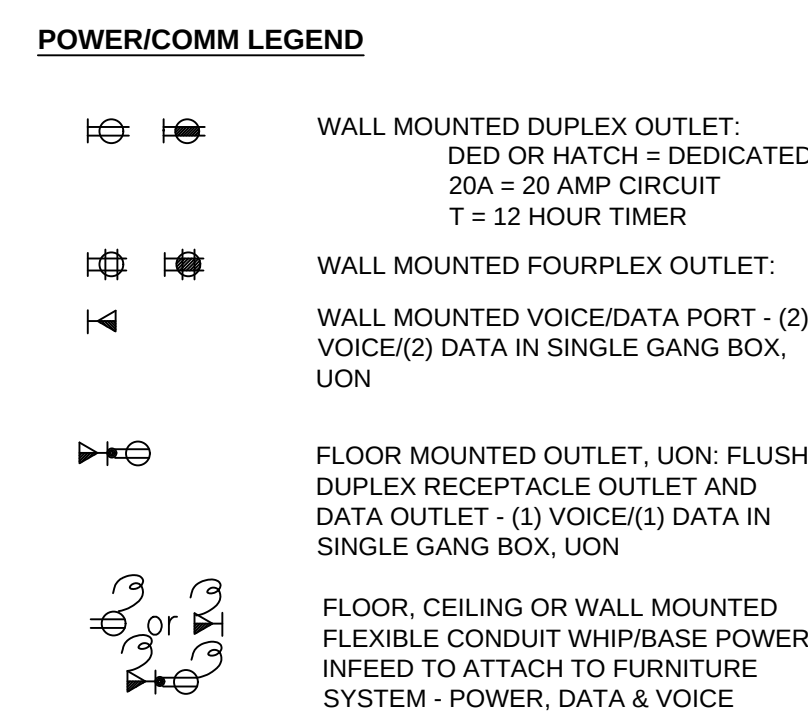
FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	STYLE/COLOR	SIZE/THICKNESS	INSTALLATION NOTES
WC1	SHADE CLOTH	ALL WINDOWS NOT IN DOORS	MECHO SHADES OR EQUAL	MANUAL ROLLER SHADE/8% OPEN BASKET WEAVE PROVIDE STANDARD COLORS FOR ARCH TO SELECT	SLIM:-7/ 3" X 4 1/2"	INSTALL INSIDE OF WINDOW RECESS, DIRECT TO HEADER. PROVIDE FASCIA, ARCH TO SELECT FROM STANDARD COLORS

FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	STYLE/COLOR	SIZE/THICKNESS	INSTALLATION NOTES
WD2	T&G CLEAR CEDAR OR CYPRESS	EXTERIOR ENTRIES	-	CABOTS SEMI-TRANSPARENT/TRANSPARENT STAIN IN NEW CEDAR	4" EXPOSURE, V-GROOVE JOINTS	GC TO PROVIDE SAMPLE OF STAINED & FINISHED WOOD FOR APPROVAL. PROVIDE CLEAR WOOD PROTECTOR.
CP1	CEMENT PANEL	EXTERIOR CLADDING	JAMES HARDIE	SMOOTH, FINISH: PT5	4" X 8" X 5/16"	RAINSCREEN INSTALLATION WITH PAINTABLE VINYL REVEALS AT JOINTS. PANELS ARE TO BE SCREWED NOT NAILED. SCREW HEAD TO BE PAINTED.
CP2	CEMENT PLANK LAP SIDING	EXTERIOR CLADDING	JAMES HARDIE	HORIZONTAL LAP SIDING, SMOOTH FINISH: PT5	6" EXPOSED: 7 1/4" X 12" X 3/8"	DIRECTLY MOUNTED TO SHEATHING, PROVIDE HARDIE TRIM PIECES AT WINDOWS, SEE DETAILS
AL1	ALUMINUM	STOREFRONT WINDOWS	CRL OR EQUAL	7200 SERIES/CLASSIC BRONZE	2" WIDE WITH 1" IGU	SEE WINDOW SCHEDULE FOR DIMENSIONS AND OPERABLE COMPONENTS
RF1	ASPHALT SHINGLES	MAIN ROOF	GAF OR EQUAL	3-TAB ROYAL SOVEREIGN SHINGLES/CHARCOAL	N/A	FLASHING AND WEATHER BARRIER PER MANUF., PROVIDE RIDGE VENT
RF2	SINGLE-PLY ROOFING	MECHANICAL WELL ROOF	GAF OR EQUAL	EVERGUARD TPO, MECHANICALLY FASTENED/WHITE	50 MIL	PROVIDE FLASHING & COPING PER MANUF., PROVIDE 1/4" COVER BOARD AS NEEDED
-	ALUMINUM EXTERIOR WALL ACCESS PANEL	MECHANICAL WELL	ACUDOR	LT-4000	36"W X 48"H	FLASH AND SEAL TO MAKE WATERTIGHT

FINISH CODE	MATERIAL	LOCATION	MANUFACTURER	STYLE	SIZE/NRC RATING	INSTALLATION NOTES
ACT1	ACOUSTIC CEILING TILE	CLOUD IN LARGE CONFERENCE	ARMSTRONG	OPTIMA VECTOR #3908, WHITE	24X48X7/8 / NRC .9	GRID: PRELUDE CONCEALED, 4" AXIOM PERIMETER TRIM AT CLOUD
ACT2	ACOUSTIC CEILING TILE	SMALL CONFERENCE, OFFICES 104 AND 106	ARMSTRONG	CORTEGA BEVELED TEGULAR #2195 WHITE	24X48X5/8 / NRC .55	PRELUDE XL GRID WHITE
ACT3	ACOUSTIC CEILING TILE	OPEN OFFICE	ETR	ETR	ETR	REPLACE DAMAGED OR STAINED CEILING TILES PRIOR TO PAINTING.

FINISH CODE	MATERIAL	LOCATION	FINISH	INSTALLATION NOTES
GPY1	GYPSUM BOARD	BREAK ROOM, COPY ROOM, CORRIDOR	PAINT	RESILIENTLY SUSPENDED. MATCH ADJACENT GWB CEILING WHERE OCCURS
GPY2	GYPSUM BOARD	FRONT DESK AND LOBBY (BENEATH MECHANICAL PENTHOUSE)	PAINT	SCREW TO BOTTOM OF CEILING JOISTS, MATCH ADJACENT GWB CEILING WHERE OCCURS

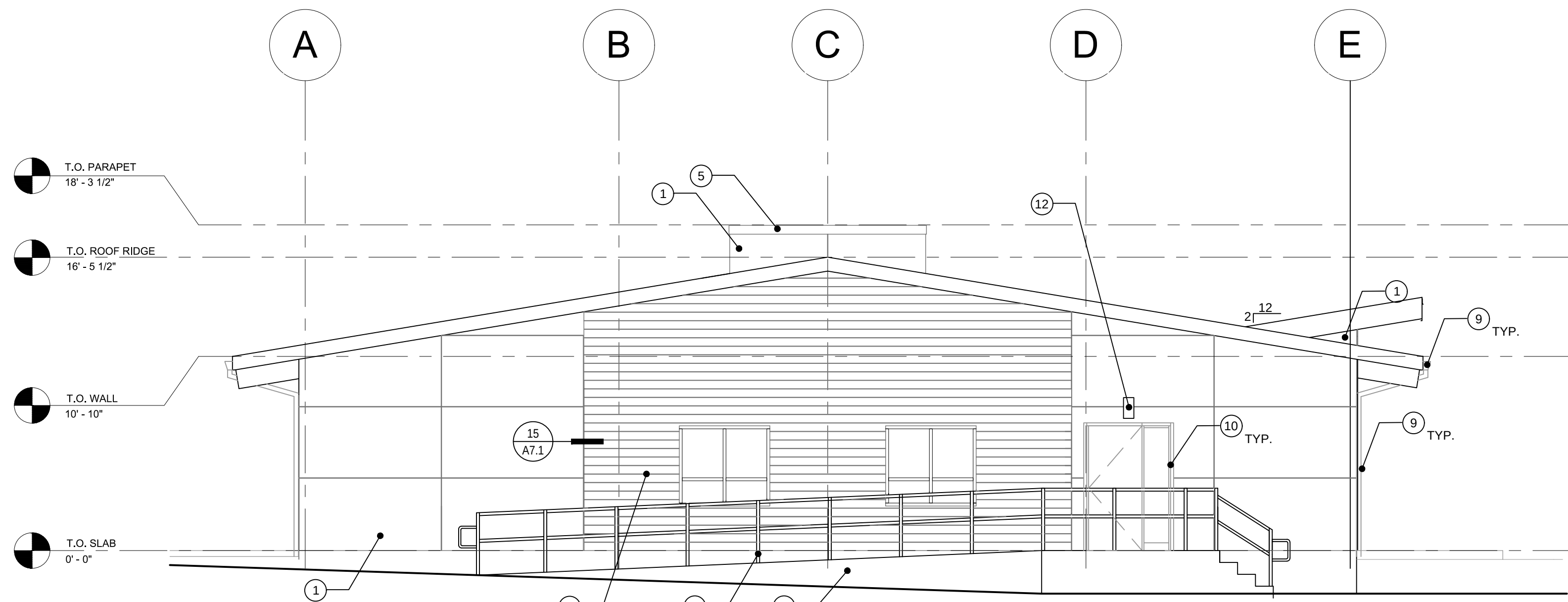
1. EXISTING VCT TILE TO REMAIN AND BE PREPARED TO RECEIVE CARPET TILE. PREPARE ALL WALL AND CEILING SURFACES TO RECEIVE NEW FINISH SCHEDULED.
2. INTERIOR GWB CEILINGS AND SOFFITS TO BE PT-4, LATEX WITH FLAT FINISH, UON.
3. SEE INTERIOR ELEVATIONS FOR LOCATION OF MILLWORK FINISHES.
4. ALL GWB WALL SURFACES TO BE SMOOTH FINISH AND RECEIVE TWO COATS OF LATEX PAINT WITH EGGSHELL FINISH.
5. GWB SURFACES TO RECEIVE LEVEL 4 FINISH PRIOR TO PAINTING. UON, REFER TO FINISH PLAN FOR EXCEPTIONS.
6. ALL MATERIALS, PREPARATION AND WORKMANSHIP SHALL CONFORM TO REQUIREMENTS OF THE LATEST EDITION OF THE ARCHITECTURAL PAINTING SPECIFICATION MANUAL BY THE MASTER PAINTERS INSTITUTE.
7. WHERE INTERIOR DOOR AND DOOR FRAMES ARE TO BE PAINTED, COLOR TO MATCH ADJACENT WALL SURFACE.
8. ALL FLOORING MATERIALS TRANSITION IN MIDDLE OF DOORWAY UNLESS NOTED OTHERWISE.
9. ACCESS PANELS, VISIBLE COVES OR ENCASEMENTS, ETC. TO SHALL BE PAINTED TO MATCH ADJACENT SURFACES.
10. ETR - EXISTING TO REMAIN
11. ALL (N) EXPOSED DUCT WORK TO REMAIN UNPAINTED



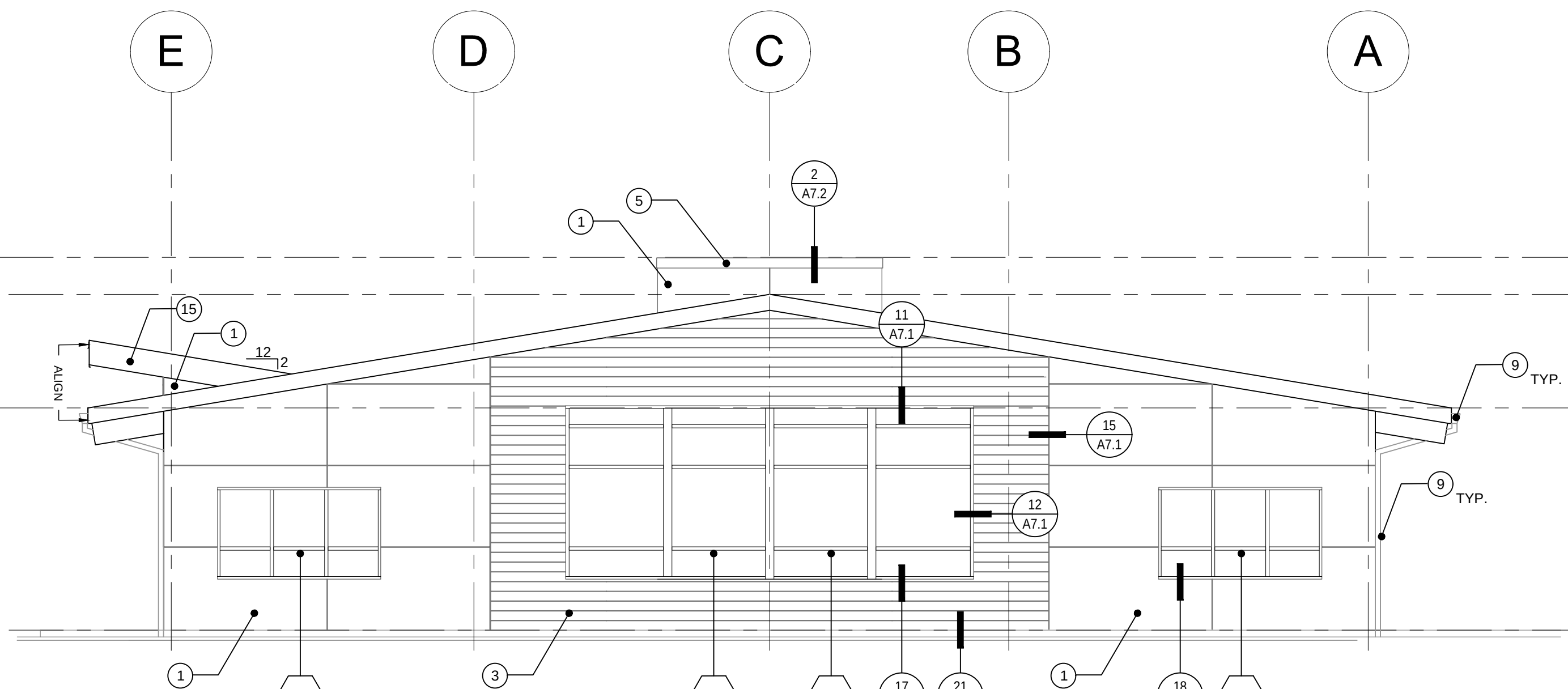


- THIS BAR DOES NOT MEASURE
1-INCH IN LENGTH, THEN THE
DRAWING IS NOT TO SCALE

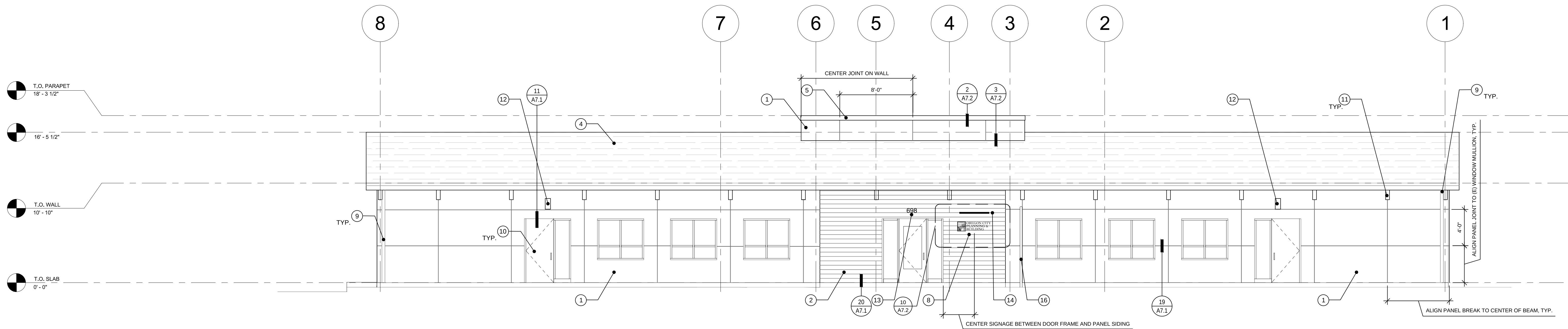




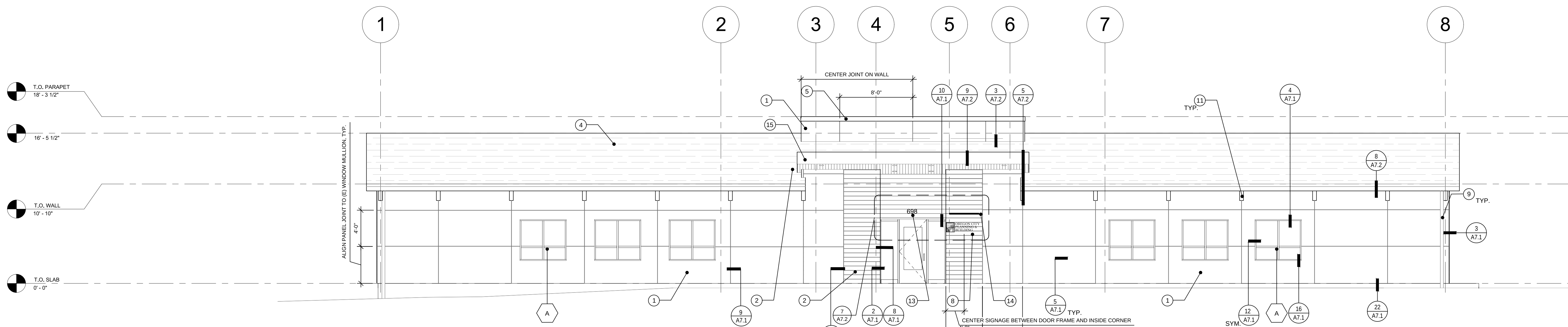
1 WEST ELEVATION



2 EAST ELEVATION



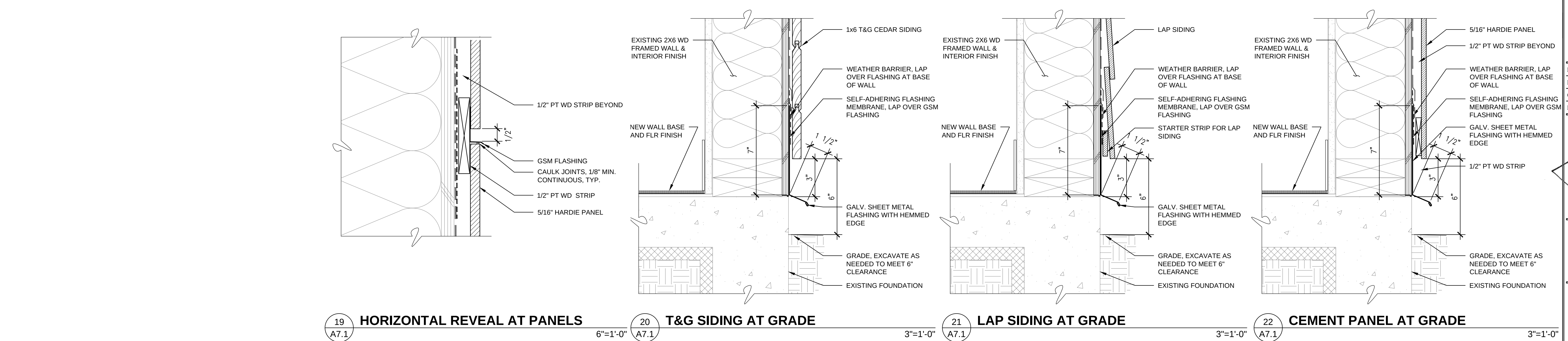
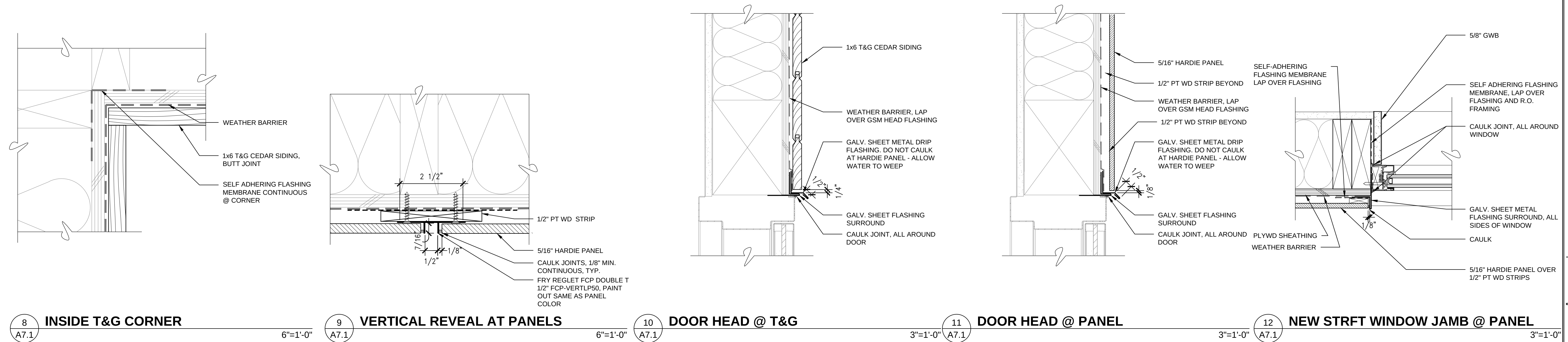
3 NORTH ELEVATION

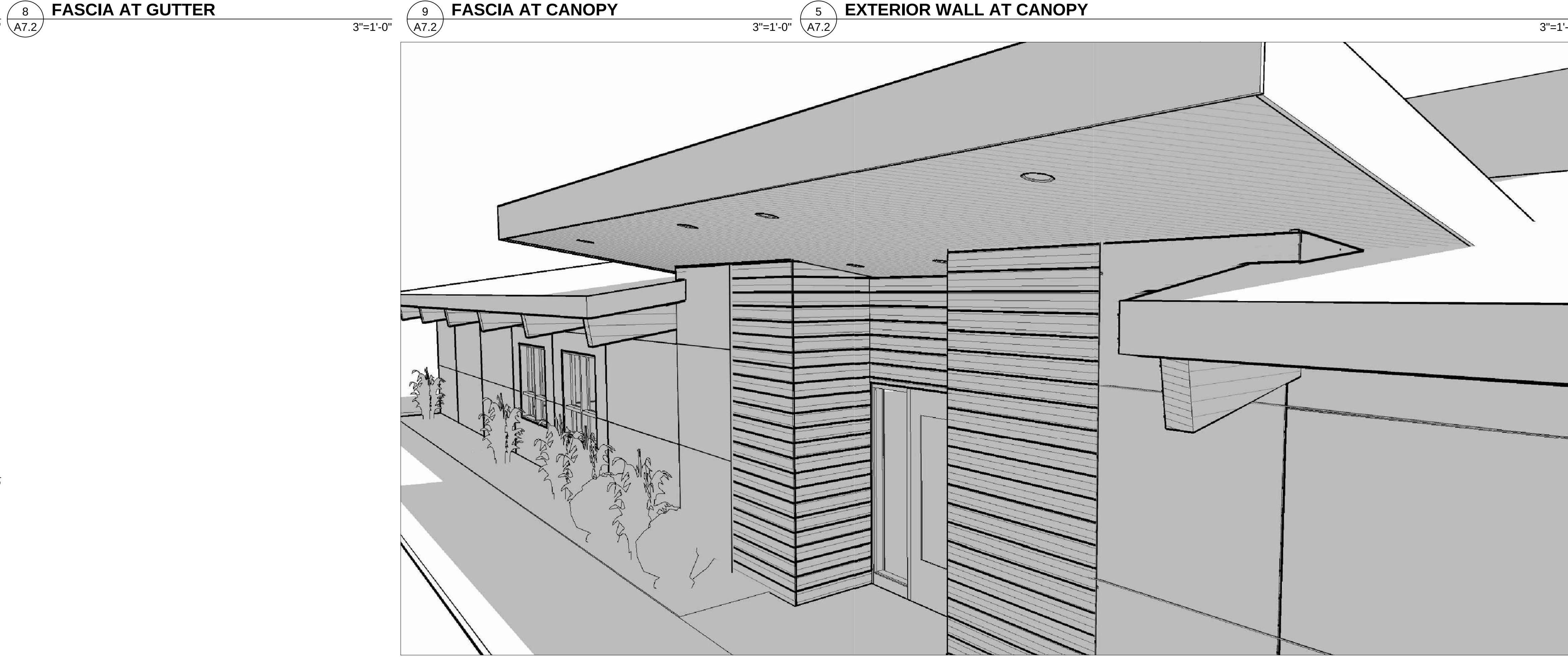
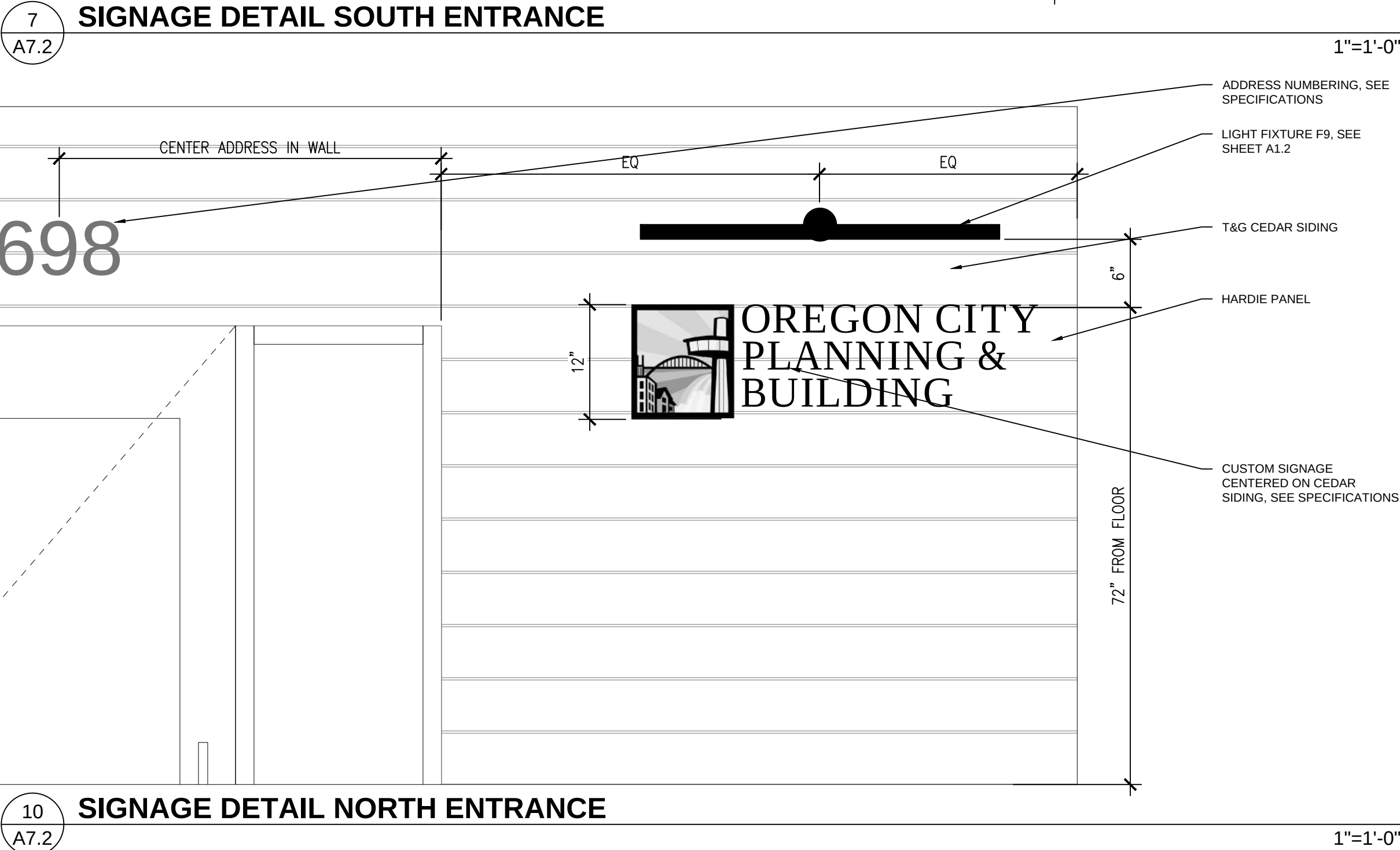
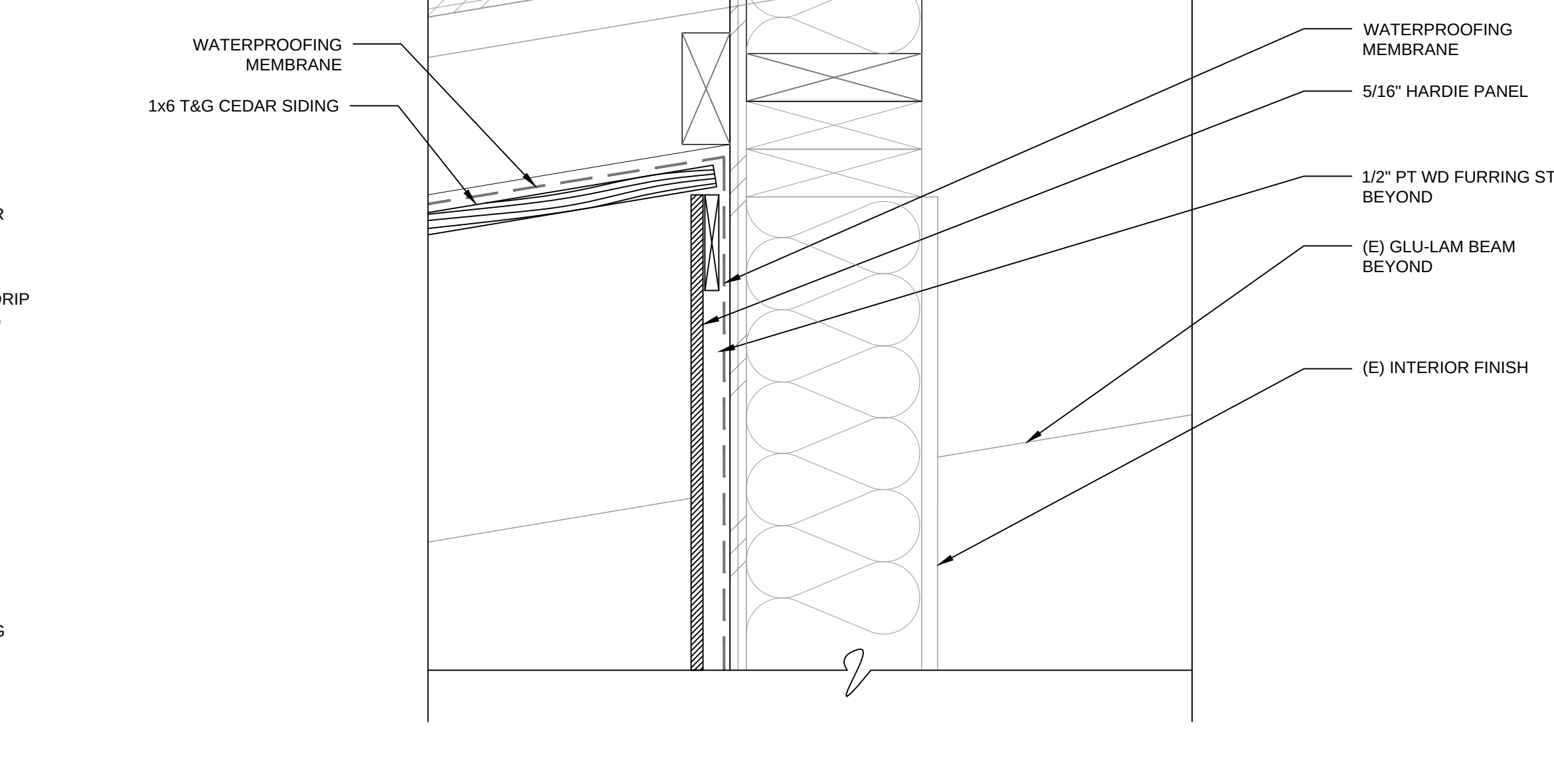
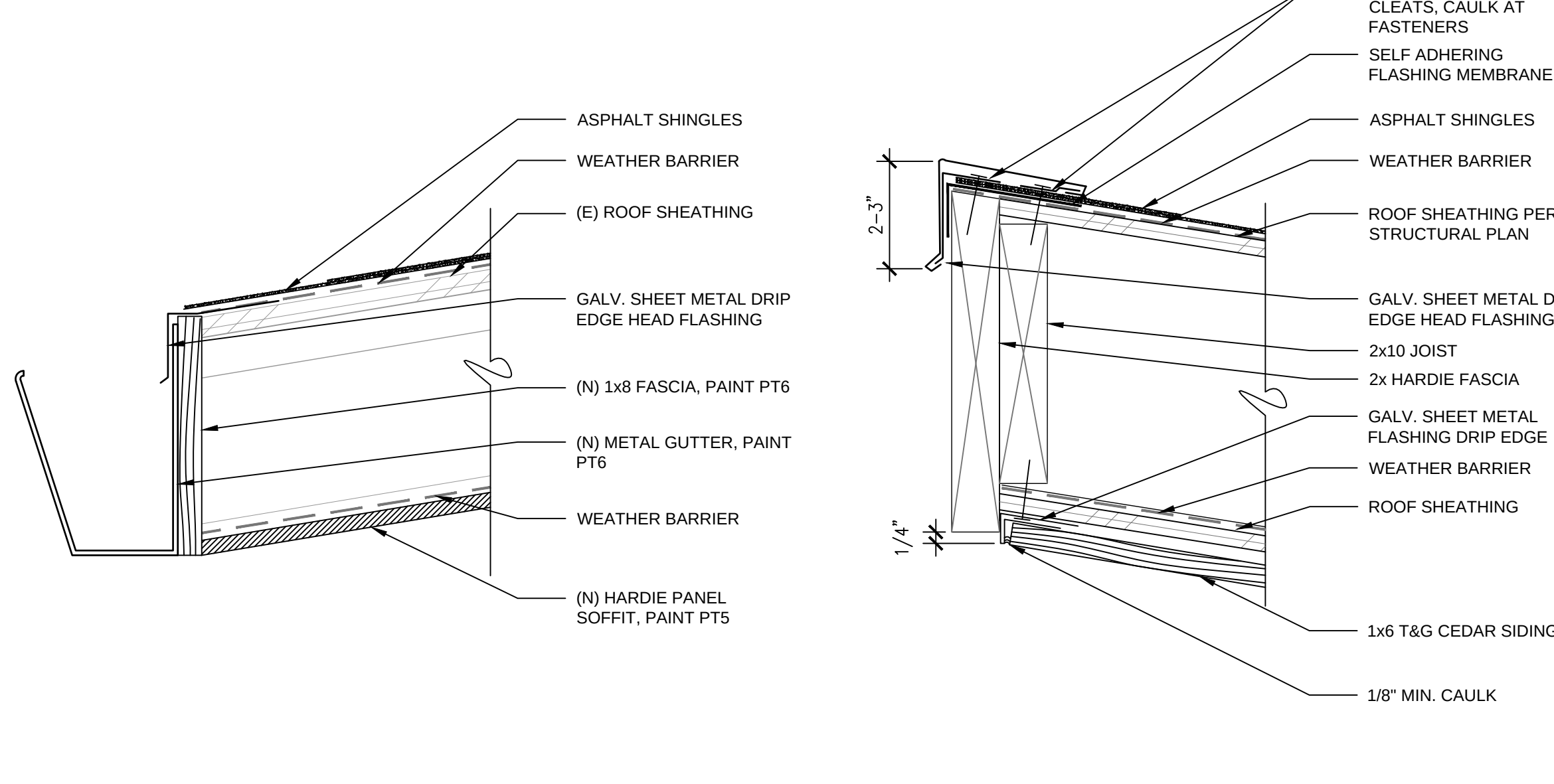
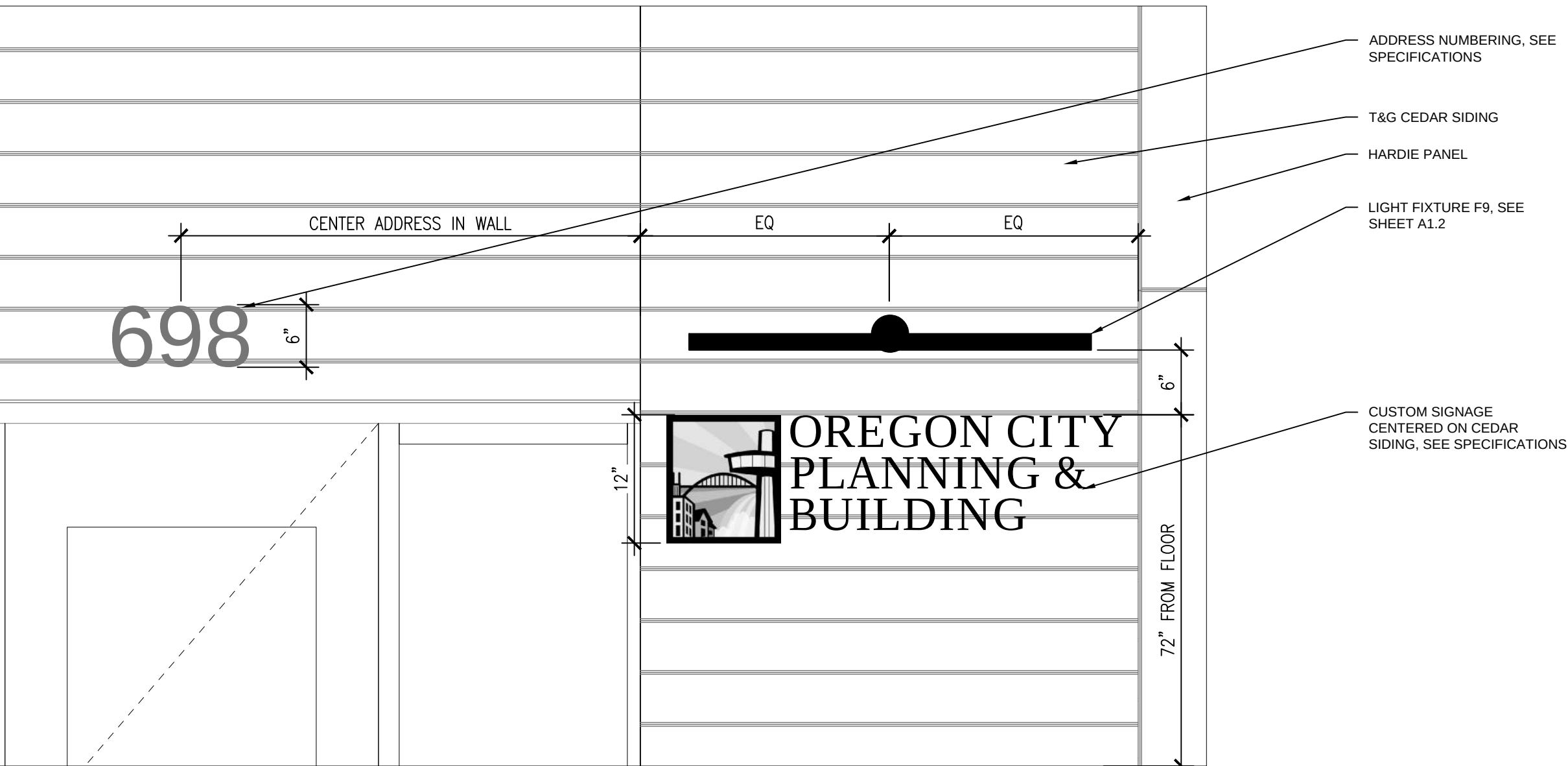
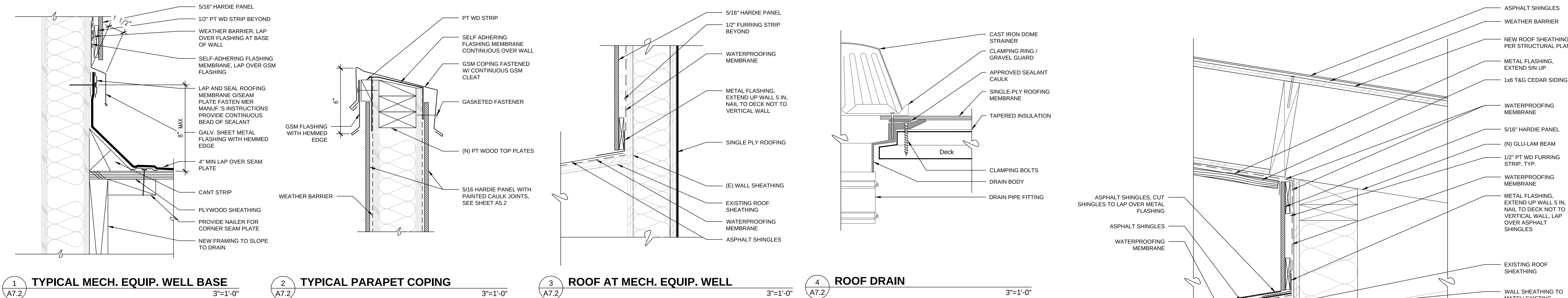


4 SOUTH ELEVATION

- 4 PLAN KEY NOTES
- 1 PANEL RAINSCREEN CLADDING: JAMES HARDIE "REVEAL PANEL SYSTEM", 4'X8'X7/16" SMOOTH FINISH, PAINTED PT5
 - 2 WOOD CLADDING: JAMES HARDIE ARTISAN V-RUSTIC SIDING
 - 3 HORIZONTAL CLADDING: JAMES HARDIE LAPSIDING, PAINTED PT5
 - 4 PITCHED ROOF ASPHALT SHINGLES: GAF 3-TAB ROYAL SOVEREIGN SHINGLES, CHARCOAL
 - 5 GSM COPING ON MECHANICAL EQUIPMENT WELL PARAPET
 - 6 EXISTING STEEL PIPING TO BE PAINTED PT6
 - 7 EXISTING CONCRETE RAMP TO REMAIN
 - 8 SIGNAGE: SEE DETAIL 7/A7.2
 - 9 NEW DOWNSPOUTS AND GUTTERS DRAINING INTO (E) DRAIN, PAINTED PT6
 - 10 PAINT DOOR AND DOOR FRAME PT5
 - 11 PAINT RAFTER TAILS PT6
 - 12 NEW LIGHT FIXTURE LOCATED IN (E) FIXTURE LOCATION, SEE A1.2
 - 13 SIGNAGE: EXTERIOR RAISED ALUMINUM (DARK BRONZE) LETTERS, 6" TALL, CENTERED OVER DOOR
 - 14 NEW LIGHT FIXTURE CENTERED ABOVE SIGNAGE, SEE A1.2
 - 15 NEW ENTRY CANOPY
 - 16 NEW 3" PVC DRAIN PIPE, LOCATED ADJACENT TO PANEL JOINT BENEATH EXPOSED RAFTER TAIL, PAINTED PT5

- PLAN GENERAL NOTES
1. PROVIDE NEW WEATHER BARRIER UNDER ALL NEW CLADDING
 2. EXTERIOR CAULKING TO BE PT5
 3. NEW GUTTER AND DOWNSPOUT TO BE PAINTED PT6





SPECIAL NOTE:
HARDIE PANELS VERTICAL JOINTS TO BE CAULKED PER MANUFACTURERS SPECIFICATION ON MECHANICAL EQUIPMENT ROOM ONLY.
CAULKING TO BE TREMCO DYMONIC FC, INTEGRAL COLOR, PROVIDE COLOR SAMPLES TO ARCHITECT FOR APPROVAL.
WEATHER BARRIER TO BE HARDIE WRAP, 11MIL THICKNESS, OR APPROVED EQUAL.

CITY OF OREGON CITY	
COMMUNITY DEVELOPMENT DEPT. TI	
1232 LINN AVE OREGON CITY 97045	
PROJECT NO: P-2195-17	
DRAWN: MOC	
CHECKED: JCH	
DATE: 10-19-17	
REGISTERED ARCHITECT	
JOELLE HARRIS	
KLAMATH FALLS, OR	
STATE OF OREGON	
EXPIRES: 12-31-17	
DETAILS	
A7.2	

ISSUED FOR PERMIT/BID



1. ALL COUNTERTOPS TO HAVE SQUARE EDGE
2. SEE FINISH SCHEDULE ON SHEET A2.0 FOR PLAM FINISHES AND DOOR HARDWARE.
3. GRAINED PLAM TO RUN VERTICAL
4. SEE ELEVATIONS FOR CABINET HEIGHT AND DIMENSIONS
5. FIELD VERIFY ALL DIMENSIONS PRIOR TO FABRICATION OF CASEWORK
6. CONTRACTOR TO PROVIDE IN-WALL BLOCKING FOR TALL AND WALL HUNG CABINETS. COORDINATE LOCATIONS WITH CASEWORK MANUFACTURER AND INSTALLER.
7. BASE CABINETS TO HAVE 2"x4" CONTINUOUS BASE.



PROJECT STRUCTURAL NOTES: (OREGON CITY/CLACKAMAS COUNTY, OREGON)

- GENERAL INFORMATION:
- GOVERNING CODE IS THE 2014 OREGON STRUCTURAL SPECIALTY CODE.
 - THE PROJECT WAS DESIGNED FOR THE FOLLOWING LOADS:
 - ROOF LIVE: 25 PSF SNOW LOAD WITH SNOW DRIFT
 - ROOF DEAD: 15 PSF
 - FLOOR LIVE: 40 PSF
 - FLOOR DEAD: 40 PSF
 - GROUND SNOW LOAD: 25 PSF
 - WIND LOAD: 130 MPH EXPOSURE B $I_w = 1.0$ SEISMIC DESIGN CATEGORY: D SEISMIC SITE CLASS: D $S_{0.5} = 0.625$ $S_{1.0} = 0.425$ $V = 22.1$ $K (R = 6.5)$
 - SEISMIC LOAD:
 - THE GENERAL CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING WORK.
 - ALL FEATURES OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME TYPE AND CHARACTER AS SHOWN FOR SIMILAR CONDITIONS, SUBJECT TO REVIEW OF THE ENGINEER OF RECORD.
 - THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION MEANS AND METHODS, RESPONSIBILITY SHALL INCLUDE BUT IS NOT LIMITED TO DEMOLITION AND CONSTRUCTION MEANS AND METHODS, TECHNIQUES, SEQUENCING, AND SAFETY REQUIRED TO COMPLETE CONSTRUCTION.
 - ALL ERECTION BRACING, TEMPORARY SHORINGS AND CONSTRUCTION SEQUENCING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
 - ALL WATERPROOFING, DAMP PROOFING, AND WEATHERPROOFING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- SPECIAL INSPECTION:
- SPECIAL INSPECTIONS REQUIRED SHALL BE PROVIDED PER OSSC CHAPTER 17 AND AS REQUIRED BY LOCAL JURISDICTION. PLEASE SEE SPECIAL INSPECTION CHECKLIST PROVIDED BY ZCS ENGINEERING DATED 09/15/17.
- FRAMING LUMBER:
- ALL FRAMING LUMBER SHALL BE DOUGLAS FIR-LARCH AND SHALL BE GRADED UNDER THE MOST RECENTLY ADOPTED RULES OF THE WEST COAST LUMBER INSPECTION BUREAU (WCLB).
 - ALL BEAMS AND JOISTS SHALL BE NUMBER 2 (UNLESS NOTED OTHERWISE).
 - ALL STUDS AND BLOCKING SHALL BE NUMBER 2.
 - ALL LUMBER IN CONTACT WITH CONCRETE OR EXPOSED SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AWPA STANDARD C-2 AND SHALL BEAR THE AWPA QUALITY MARK.
 - ALL FRAMING CONNECTIONS TO BE MADE WITH SIMPSON FRAMING HARDWARE. COORDINATE SELECTION W/ ENGINEER PRIOR TO CONSTRUCTION.
- PLYWOOD SHEATHING:
- ALL PLYWOOD SHALL BE C-D GRADE WITH EXTERIOR GLUE MANUFACTURED IN ACCORDANCE WITH THE UNITED STATES PRODUCT STANDARD PS-1 (SPANS A195.1 FOR CONSTRUCTION AND INDUSTRIAL PLYWOOD) AND SHALL CONFORM TO UBC STANDARD 23-2 AND SHALL BEAR THE TRADEMARK OF THE APA.
 - PLYWOOD SHALL BE Laid WITH END JOINTS STAGGERED.
 - BLOCK ALL SHEAR WALL SHEATHING WITH 2X BLOCKING AT ALL EDGES UNLESS NOTED OTHERWISE.
 - OSB MAY BE SUBSTITUTED FOR PLYWOOD WITH SAME SPAN RATING.
- TIMBER FASTENERS:
- ALL TIMBER MATERIAL SHALL BE FASTENED PER OSSC TABLE 2304.9.1, "FASTENING SCHEDULE" U.N.O.
- CONCRETE ACCESSORIES:
- EXPANSION BOLTS SHALL BE HILTI KWIK TZ, SIMPSON STRONG BOLT, POWERS POWER STUD®, OR APPROVED WITH EQUIVALENT ICC ALLOWABLE TENSION AND SHEAR VALUES. EXPANSION BOLTS SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS. DO NOT CUT REINFORCING IN NEW OR EXISTING CONCRETE DURING INSTALLATION.
 - EPOXY ADHESIVE SHALL BE HILTI RE200-SD, SIMPSON SET XP, POWERS 1000+, OR APPROVED WITH EQUIVALENT ICC ALLOWABLE TENSION AND SHEAR VALUES. EPOXY ANCHORS SHALL BE INSTALLED IN STRICT CONFORMANCE WITH MANUFACTURER'S RECOMMENDATIONS. DO NOT CUT REINFORCING IN NEW OR EXISTING CONCRETE DURING INSTALLATION.
 - PERMANENTLY EXPOSED EMBEDDED PLATES AND ANGLES SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION, UNLESS OTHERWISE NOTED. NO LOADS OR WELDS SHALL BE PLACED ON EMBEDDED PLATES OR ANGLES FOR A MINIMUM OF 7 DAYS AFTER CASTING.

FOUNDATION AND FRAMING PLAN NOTES

- DIMENSIONS SHOWN ARE FOR REFERENCE ONLY. CONFIRM W/ ARCHITECTURAL PLAN & DETAILS.
-
-  INDICATES SHEAR WALL ABOVE FOUNDATION
-  INDICATE HOLDOWN TYPE & LOCATION AT END OF SHEARWALL, TYPICAL U.N.O. ON PLAN.
-  SYMBOL INDICATES SHEAR WALL TYPE, TYP.
- SEE PROJECT STRUCTURAL NOTES ON THIS PAGE FOR ADDITIONAL INFORMATION.

HOLDOWN SCHEDULE

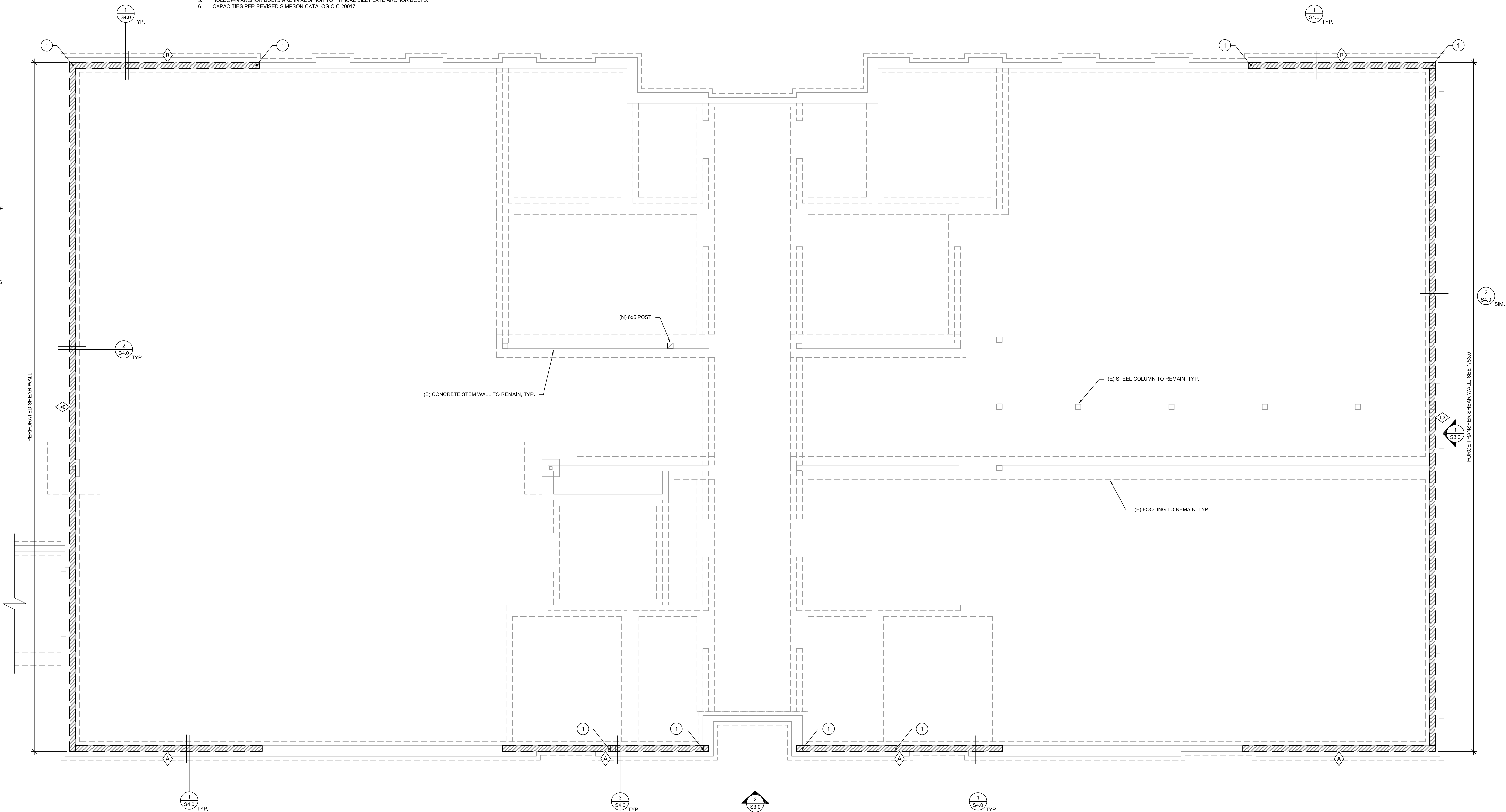
Y	SIMPSON MODEL	ALLOWABLE LOAD (LBS.)	MINIMUM POST THICKNESS	FASTENERS	ANCHORS	REMARKS
1	DTT22	2145	(2) 2x STUD	(8) 1/4" x 1-1/2" SD6	1/2" Ø THREADED ROD	EMBED THREADED ROD MIN. 6" INTO EXISTING FOOTING. USE HILTI HIT-RE 900 V3 EPOXY. SIMPSON CATALOG C-C-20017

- HARDWARE IS TO BE SIMPSON, U.N.O.
- HOLDOWN HARDWARE CAN BE EXTENDED WITH A307 THRD ROD AND COUPLER.
- ALIGN ALL HOLDOWNS FOR THE FULL HEIGHT OF STRUCTURE.
- ALL HARDWARE TO BE INSTALLED PER MANUFACTURE'S SPECIFICATIONS.
- HOLDOWN ANCHOR BOLTS ARE IN ADDITION TO TYPICAL SILL PLATE ANCHOR BOLTS.
- CAPACITIES PER REVISED SIMPSON CATALOG C-C-20017.

SHEARWALL SCHEDULE

◇	SHEATHING	SHEAR (PLF)	NAIL SIZE	EDGE NAILS (O.C.)	FIELD NAILS (O.C.)	MAX. STUD SPACING	PANEL EDGE STUD DIMENSION	MUDSILL DIMENSION	TOP PLATE A35 (O.C.)	5/8" x 6-1/2" TITEN ANCHOR BOLT	REMARKS
A	(E) 1/2" PLYWOOD, ONE SIDE	155	10d	6"	6"	24"	2x	2x	4'-0"	4'-0"	UNBLOCKED SHEAR WALL
B	(E) 1/2" PLYWOOD, ONE SIDE	310	10d	4"	6"	24"	2x	2x	2'-0"	2'-6"	PROVIDE HORIZONTAL EDGE BLOCKING
C	(E) 1/2" PLYWOOD, ONE SIDE	600	10d	3"	6"	24"	2x	2x	1'-0"	1'-4"	SEE 2/53.1 FOR BLOCKING & STRAPPING REQUIREMENTS

- ALL PLYWOOD TO BE APA RATED STRUCTURAL 1 EXTERIOR SHEATHING
- ALL NAILS TO BE COMMON OR GALVANIZED BOX TYPE.
- ROOF DAMPPRISMS TO BE NAILED WITH 16d NAILS @ 6" O.C. EDGE NAILING AND 12" ON CENTER FIELD NAILING. USE PLYWOOD THICKNESS AS INDICATED ON PLAN.
- ALL WALL SHEATHING TO EXTEND FULL HEIGHT OF WALL, TOP PLATE TO BOTTOM PLATE.
- ALL SHEARWALLS AND HOLDOWNS MUST HAVE CONTINUOUS LOAD PATH TO FOUNDATION.
- USE 3" x 3" x 1/4" PLATE WASHER TYPICAL AT ALL ANCHOR BOLTS.
- ALL SHEAR WALLS TO BE FULLY BLOCKED U.N.O. BLOCKING TO MATCH REQUIREMENTS FOR PANEL EDGE STUDS.
- FOR SHEARWALLS W/ STUDS SPACED AT 24" O.C. MAX, INSTALL SHEATHING WITH LONG DIMENSION ACROSS STUDS.



FOUNDATION PLAN
1/4"= 1'-0"

IF THIS BAR DOES NOT MEASURE 1-ARCH IN LENGTH THEN THE DRAWING IS NOT TO SCALE

DATE

REVISIONS

NO

CITY OF OREGON CITY
COMMUNITY DEVELOPMENT DEPT. TI
1232 LINN AVE OREGON CITY 97045

ZCS
ENGINEERING
524 Main Street - Suite 102, Oregon City, OR 97045
(503) 992-5559

PROJECT NO: P-2195-17
DRAWN: SDW
CHECKED: MRS
DATE: 09-15-17

REGISTERED PROFESSIONAL ENGINEER
MATTHEW R. SMITH
EXPIRES: 06-30-18

FOUNDATION PLAN

S1.0

100% CONSTRUCTION DOCUMENTS

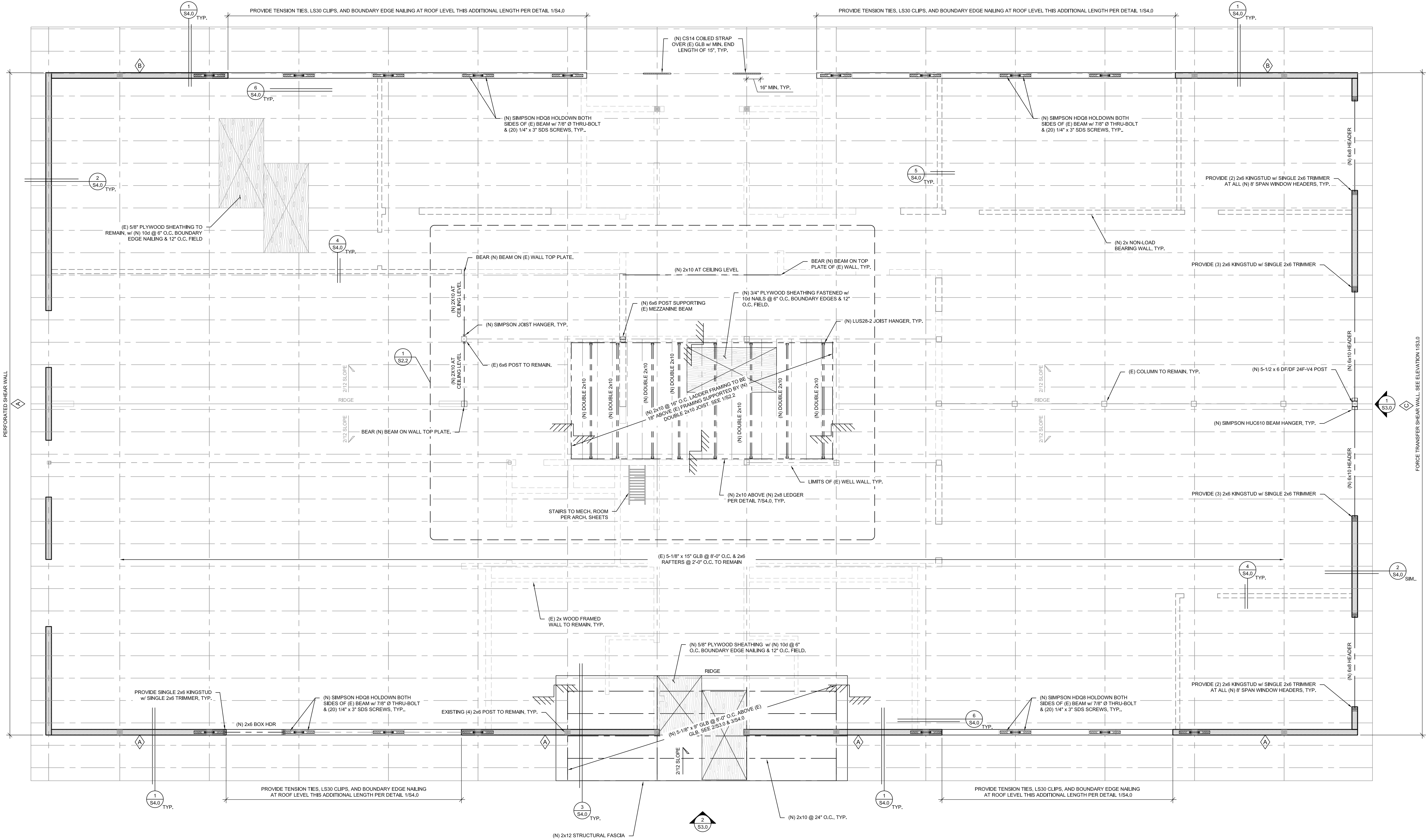
FLOOR / ROOF FRAMING NOTES

- COORDINATE ALL DIMENSIONS & FEATURES NOT SHOWN WITH ARCHITECT.
- INDICATES SHEAR WALL TYPE, SEE SHEARWALL SCHEDULE.
- INDICATES SHEARWALL LOCATION BELOW FRAMING, SEE SCHEDULE.
- ALL SHEAR WALLS INDICATED AS "PERFORATED" THE CONTRACTOR SHALL PROVIDE NAILING PATTERN AROUND ALL WALL PENETRATIONS AS CALLED OUT ON FRAMING PLANS IN CORRESPONDENCE WITH THE SHEAR WALL SCHEDULE.
- ALL SHEAR WALLS INDICATED AS "FORCE TRANSFER" THE CONTRACTOR SHALL PROVIDE HORIZONTAL BLOCKING AND STRAPPING PER THE ELEVATION PROVIDED.
- SEE PROJECT STRUCTURAL NOTES ON S1.0 FOR MORE INFORMATION.

SHEARWALL SCHEDULE

	SHEATHING	SHEAR (PLF)	NAIL SIZE	EDGE NAILS (O.C.)	FIELD NAILS (O.C.)	MAX. STUD SPACING	PANEL EDGE STUD DIMENSION	MUDSILL DIMENSION	TOP PLATE A35 (O.C.)	3/8" x 6-1/2" TITEN ANCHOR BOLT	REMARKS
A	(E) 1/2" PLYWOOD, ONE SIDE	155	10d	6"	6"	24"	2x	2x	4'-0"	4'-0"	UNBLOCKED SHEAR WALL
B	(E) 1/2" PLYWOOD, ONE SIDE	310	10d	4"	6"	24"	2x	2x	2'-0"	2'-6"	PROVIDE HORIZONTAL EDGE BLOCKING
C	(E) 1/2" PLYWOOD, ONE SIDE	600	10d	3"	6"	24"	2x	2x	1'-0"	1'-4"	SEE 2/53.0 FOR BLOCKING & STRAPPING REQUIREMENTS

- ALL PLYWOOD TO BE APA RATED STRUCTURAL 1 EXTERIOR SHEATHING.
- ALL NAILS TO BE COMMON OR GALVANIZED BOX TYPE.
- ROOF DIAPHRAGMS TO BE NAILED WITH 10d NAILS @ 8" O.C. EDGE NAILING AND 12" ON CENTER FIELD NAILING. USE PLYWOOD THICKNESS AS INDICATED ON PLAN.
- ALL WALL SHEATHING TO EXTEND FULL HEIGHT OF WALL TOP PLATE TO BOTTOM PLATE.
- ALL SHEARWALLS AND HOLDOWNS MUST HAVE CONTINUOUS LOAD PATH TO FOUNDATION.
- USE 3" x 3" x 1/4" PLATE WASHER TYPICAL AT ALL ANCHOR BOLTS.
- ALL SHEAR WALLS TO BE FULLY BLOCKED U.N.O. BLOCKING TO MATCH REQUIREMENTS FOR PANEL EDGE STUDS.
- FOR SHEARWALLS W/ STUDS SPACED AT 24" O.C. MAX. INSTALL SHEATHING WITH LONG DIMENSION ACROSS STUDS.

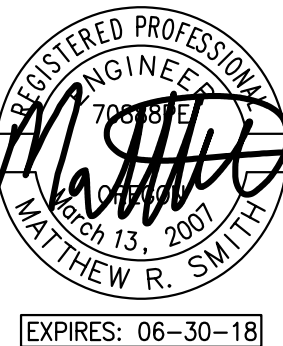


1 ROOF FRAMING PLAN
1/4" = 1'-0"

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DATE: 09-15-17



ROOF FRAMING PLAN

THIS BAR DOES NOT MEASURE
-INCH IN LENGTH, THEN THE
DRAWING IS NOT TO SCALE

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ECT NO: P-2195-17

IN:	SDW
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WED: MRS

09-15-17

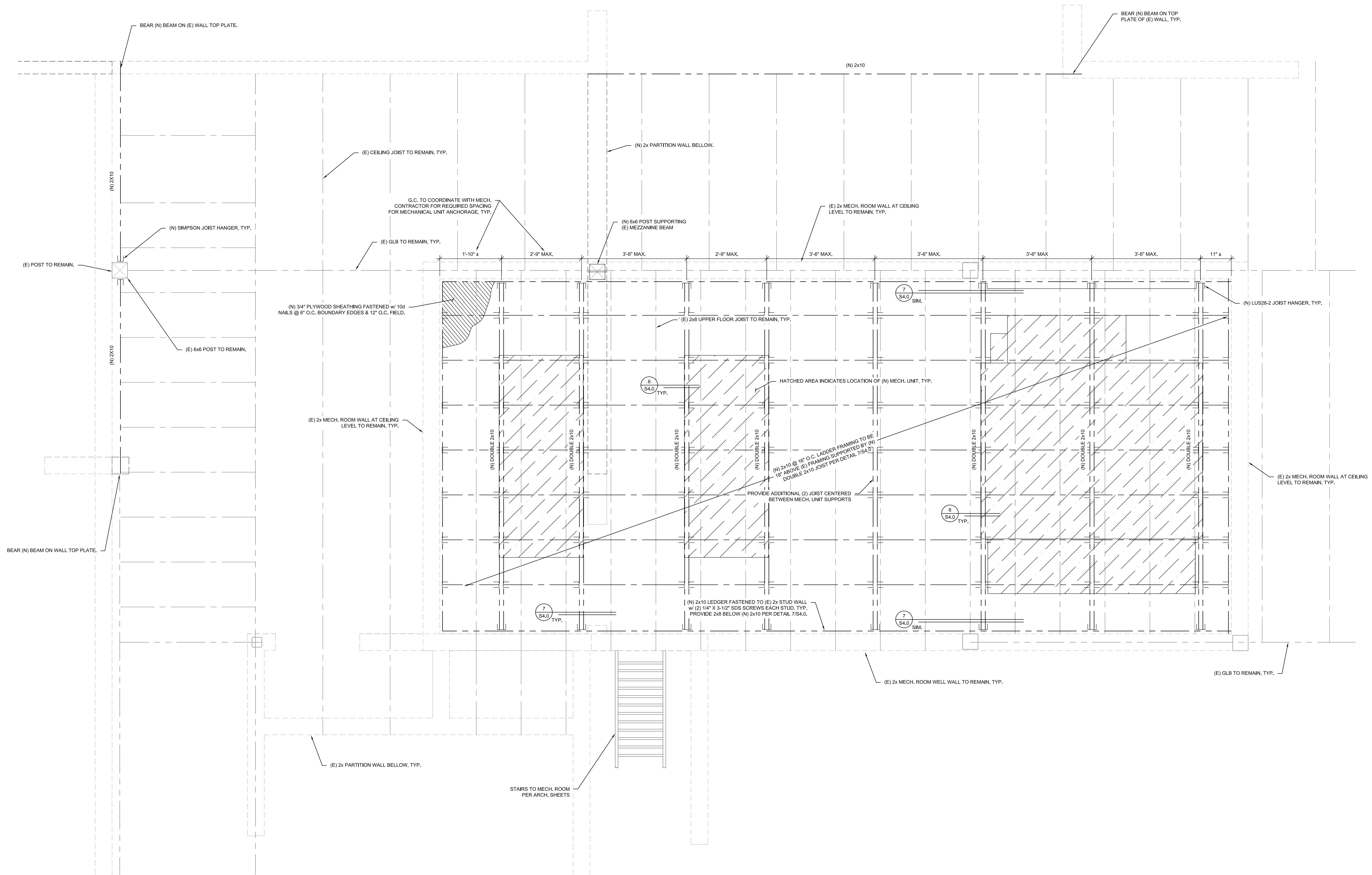


EXPIRES: 06-30-18

PARTIAL CEILING
FRAMING PLAN

62.2

100% CONSTRUCTION DOCUMENTS



PARTIAL CEILING FRAMING PLAN

IF THIS BAR DOES NOT MEASURE
1' INCH IN LENGTH THEN THE
DRAWING IS NOT TO SCALE

DATE

REV

REVISIONS

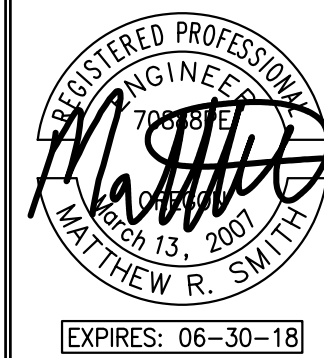
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1232 LINN AVE OREGON CITY 97045



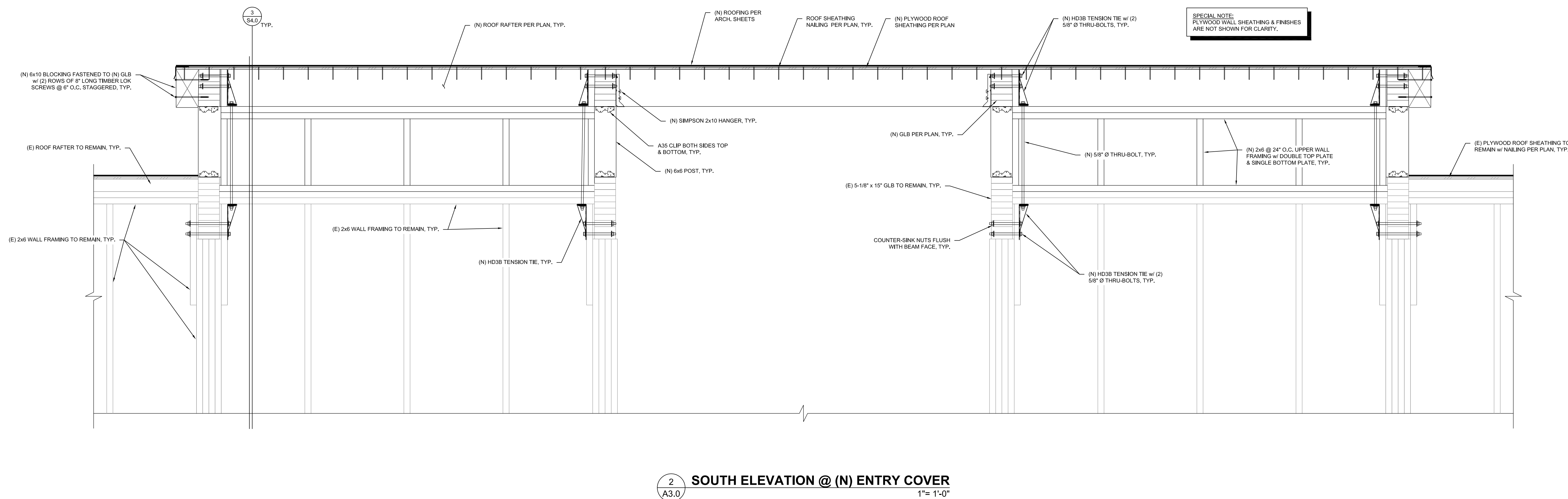
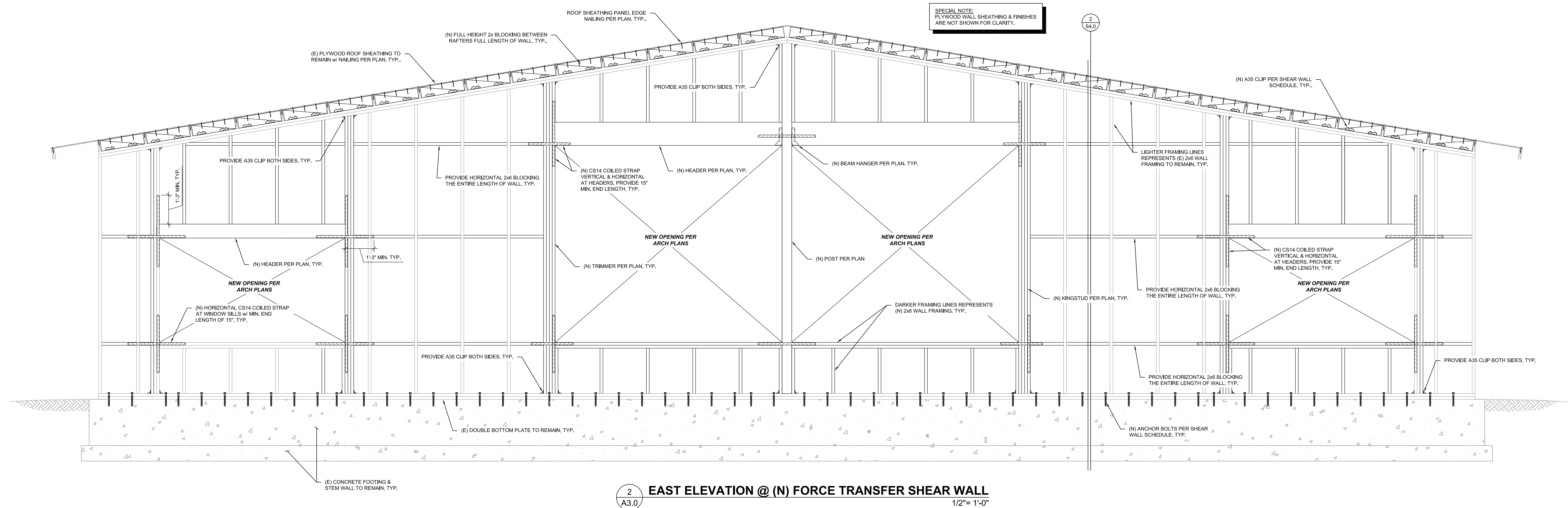
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DRAWN: SDW
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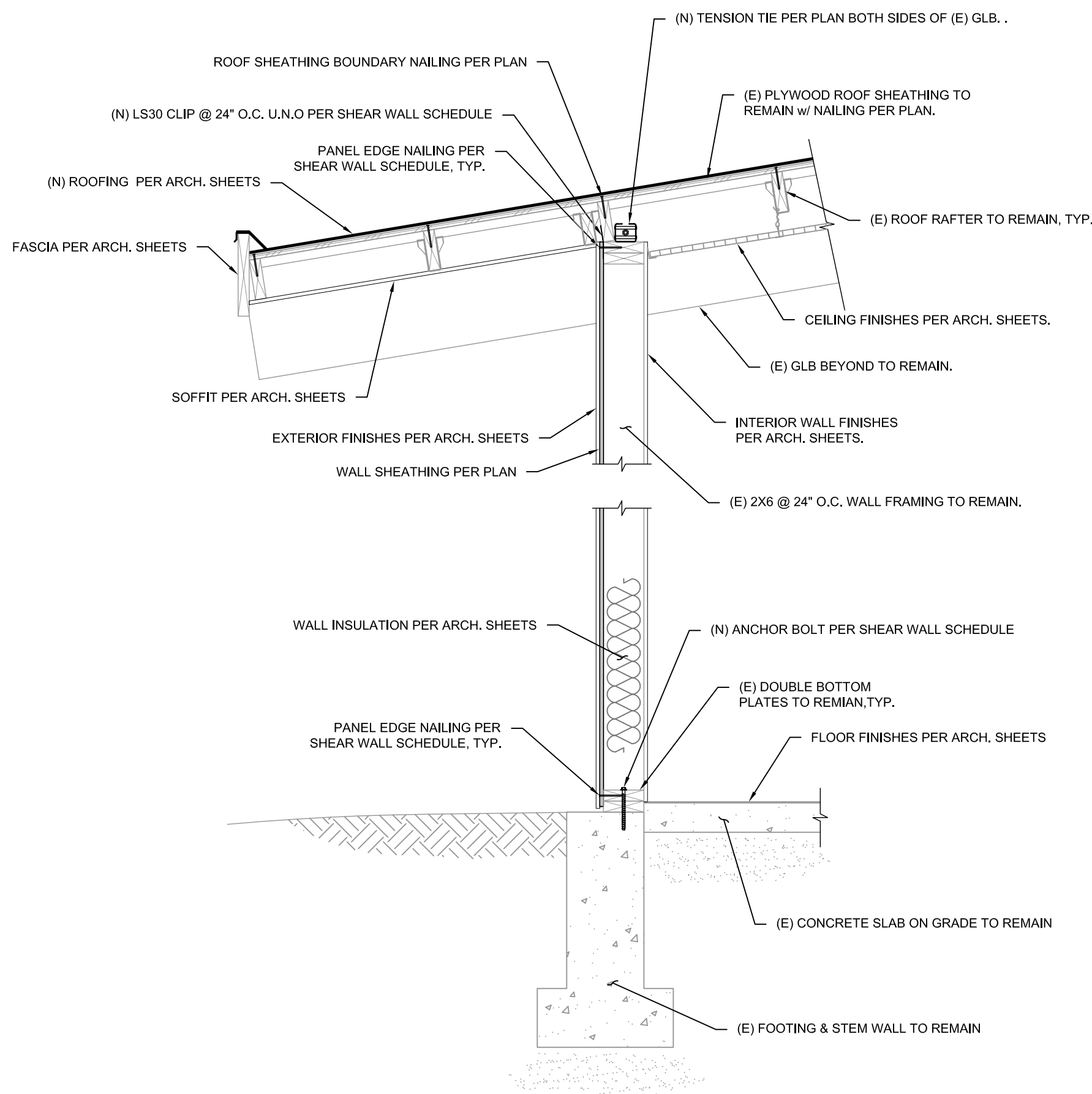


EAST & SOUTH
STRUCTURAL
ELEVATIONS

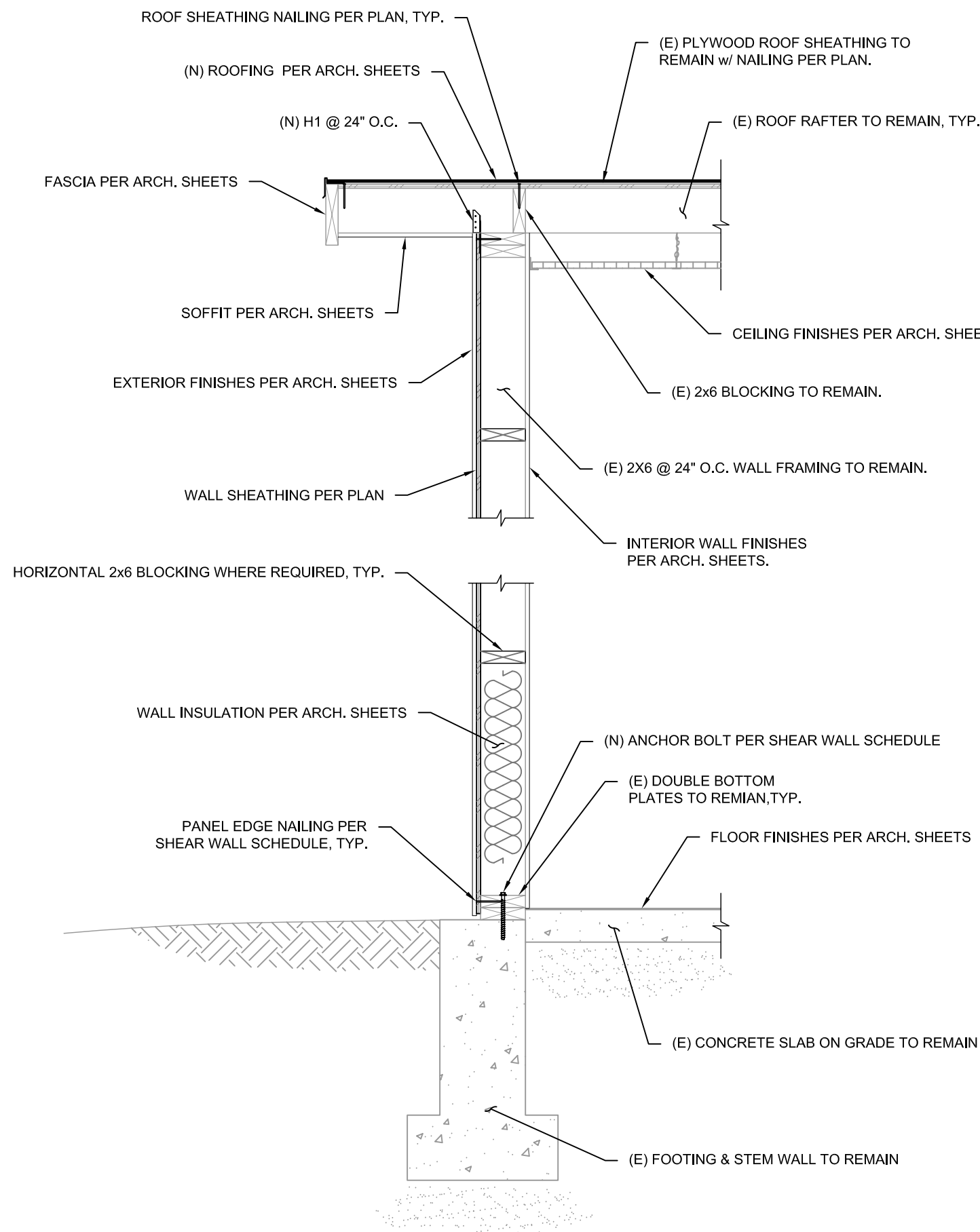
S3.0

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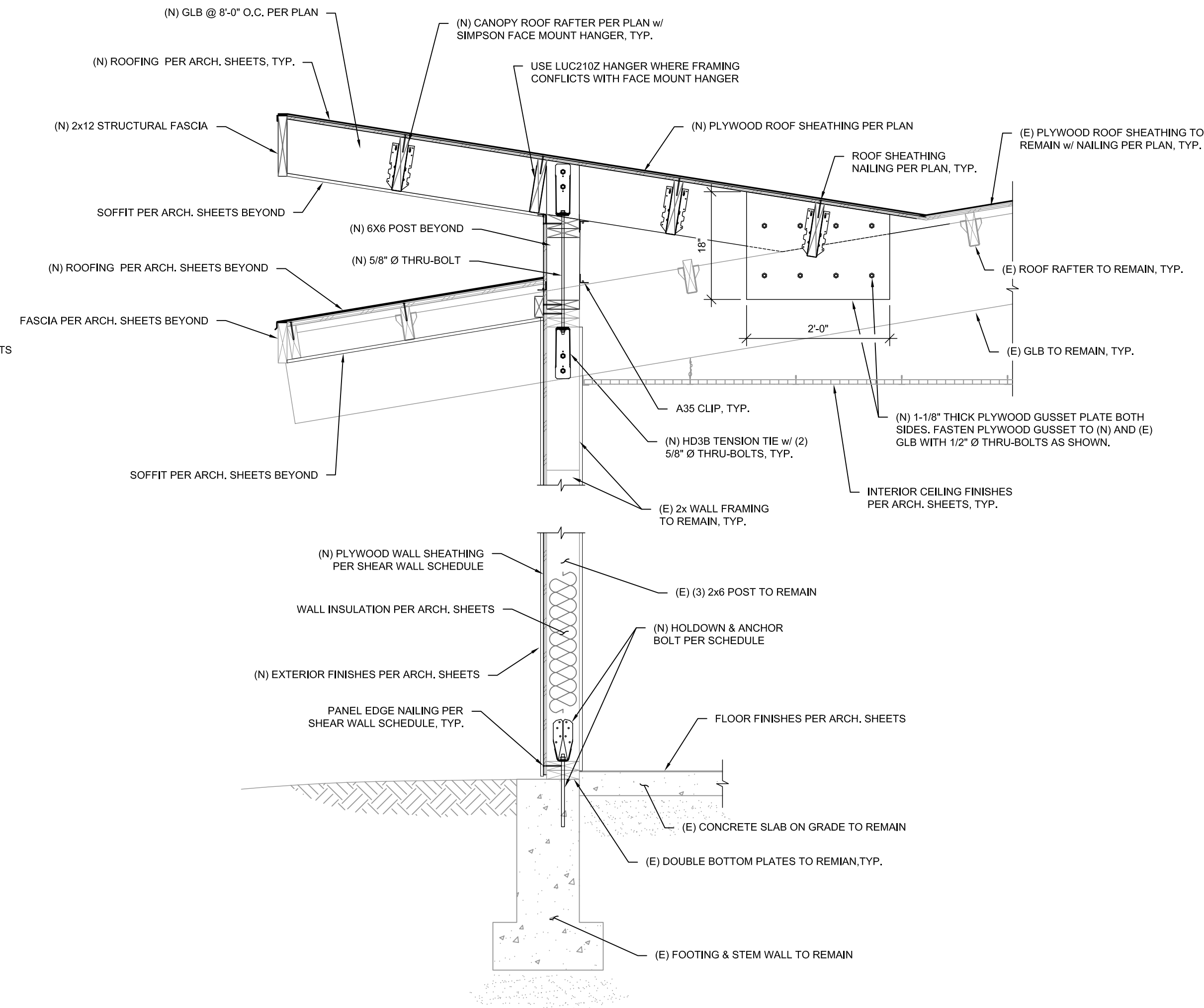




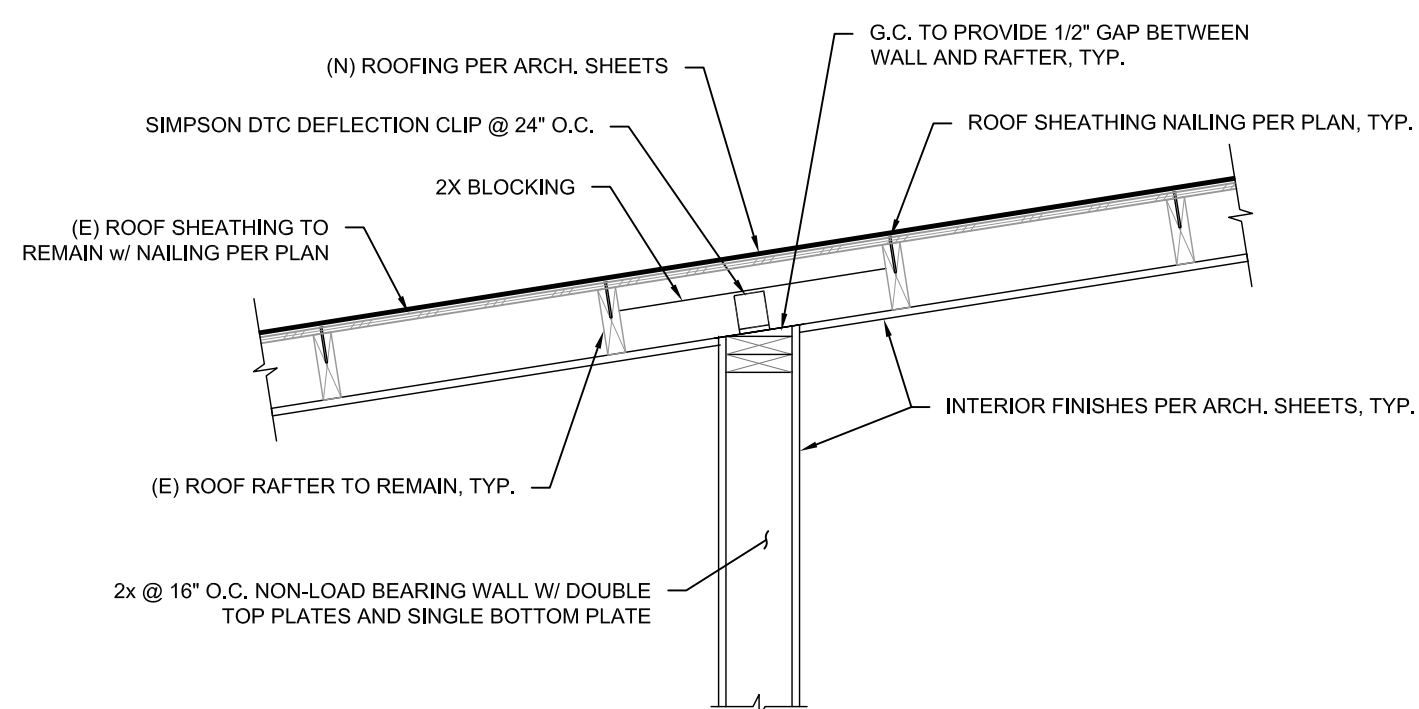
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S4.0 TYP. LONG. EXTERIOR SHEAR WALL SECTION
3/4" = 1'-0"



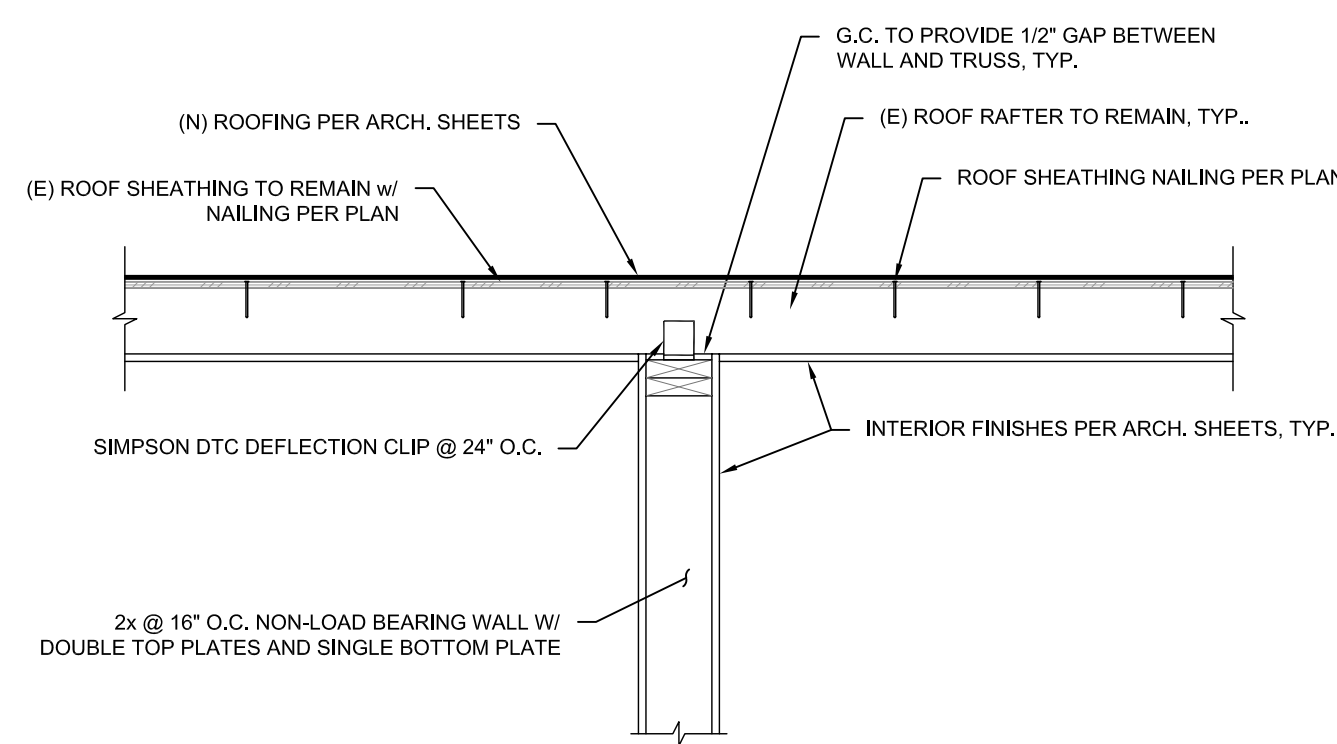
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S4.0 TYP. TRANSVERSE EXTERIOR SHEAR WALL SECTION
3/4" = 1'-0"



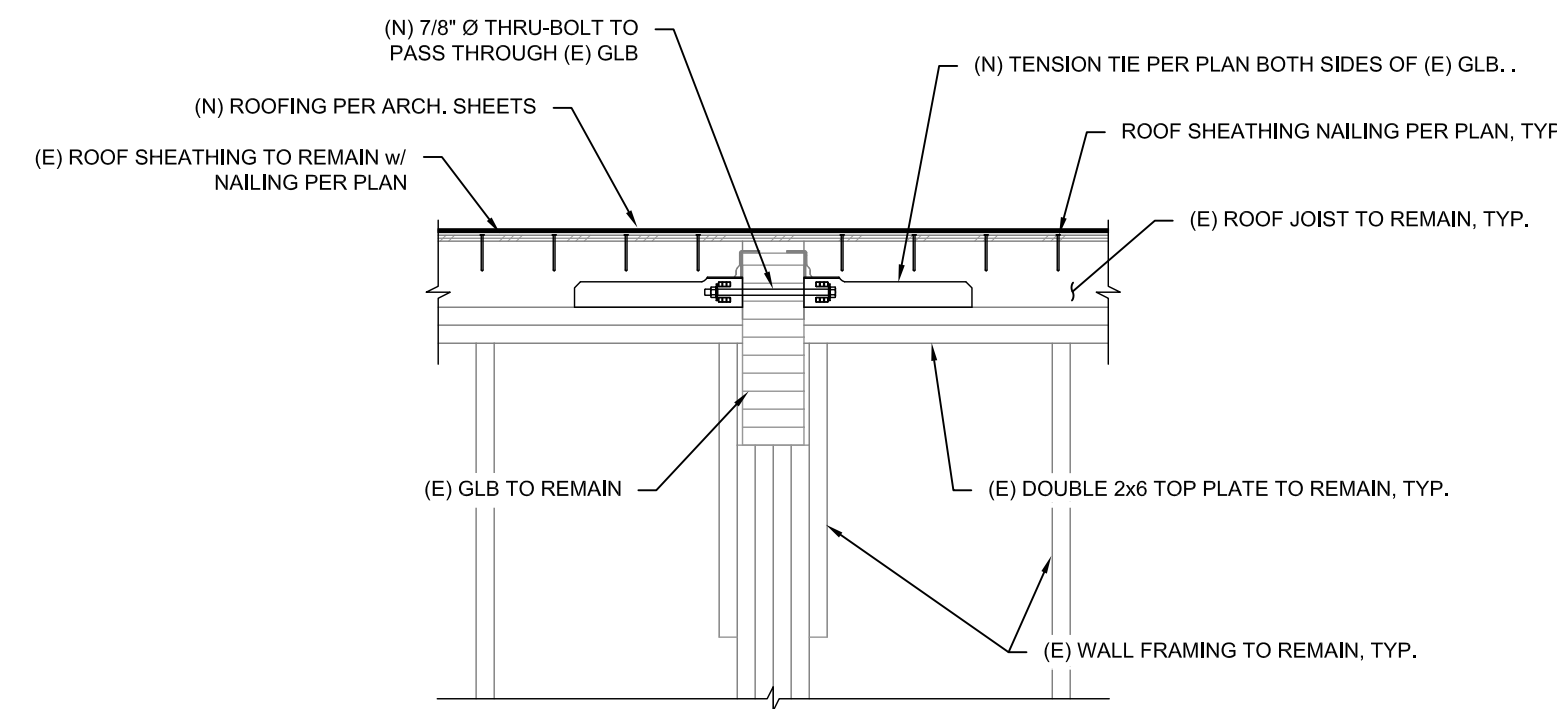
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S4.0 WALL SECTION @ (N) CANOPY
3/4" = 1'-0"



4
S4.0 RAFTER PARALLEL TO PARTITION
3/4" = 1'-0"



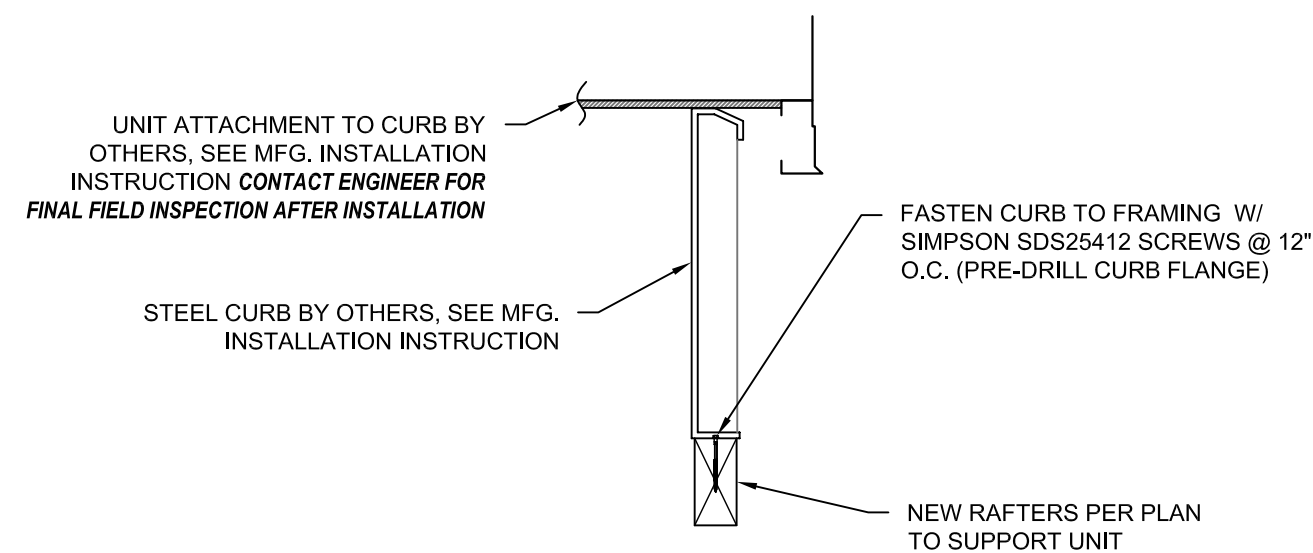
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S4.0 RAFTER PERP. TO PARTITION
3/4" = 1'-0"



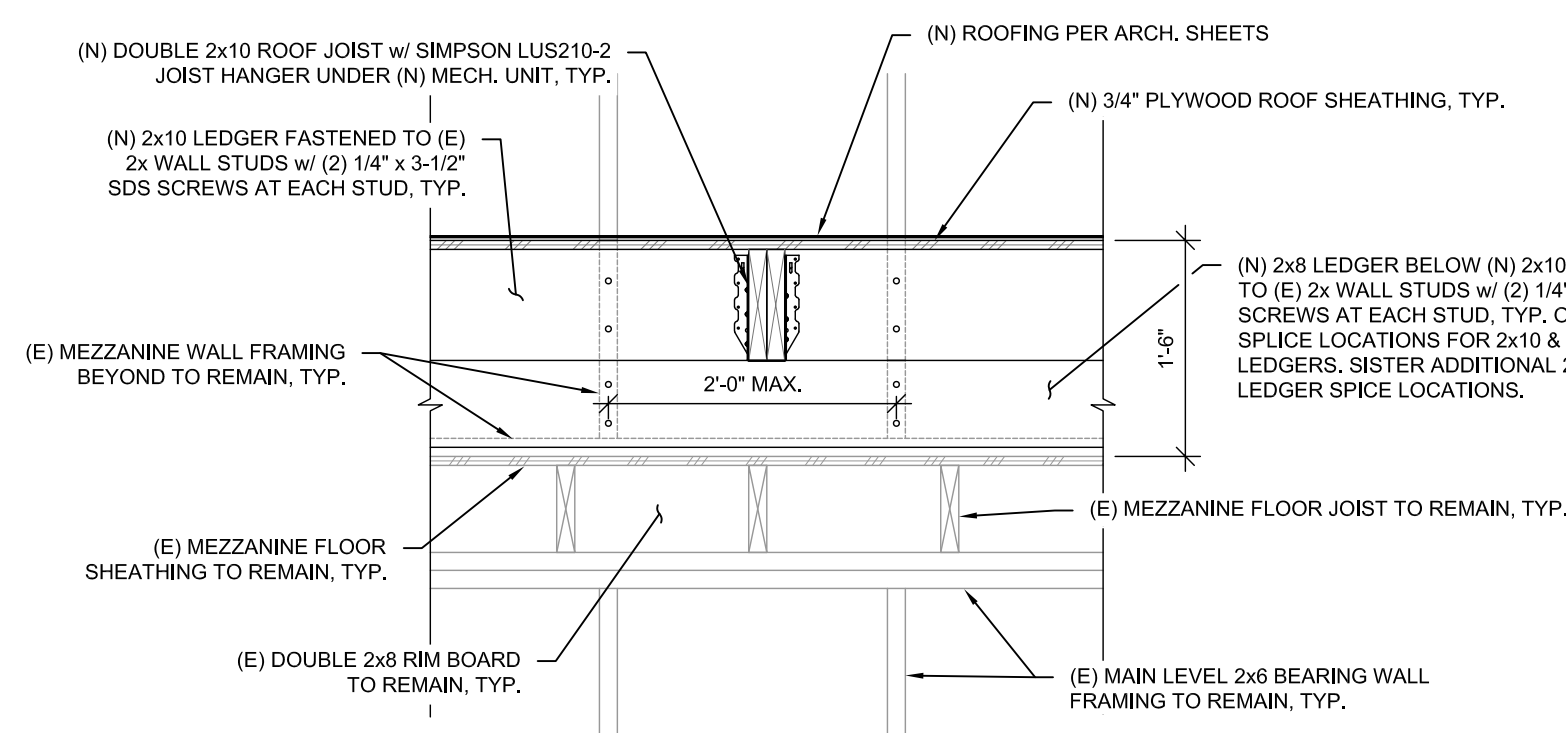
6
S4.0 TYP. EXTERIOR WALL AT (E) GLB
3/4" = 1'-0"

SPECIAL NOTE:
G.C. TO COORDINATE STRENGTHENING REQUIREMENTS W/ ENGINEER OF RECORD FOR ALL MECHANICAL DUCT PENETRATIONS THROUGH THE EXISTING DECKING PRIOR TO CONSTRUCTION.

CONSTRUCTION NOTE:
SEE CURB MANUFACTURE INSTALLATION INSTRUCTION FOR ORIENTATION REQ'TS. PER MFG. G.C. SHALL SUBMIT LOCATION OF CURB PLACEMENT ON NEW ROOF WITH FIELD DIMENSIONS TO ENGINEER FOR REVIEW AND APPROVAL.



7
S4.0 CURB ATTACHMENT TO ROOF @ NEW ROOFTOP UNIT
3/4" = 1'-0"

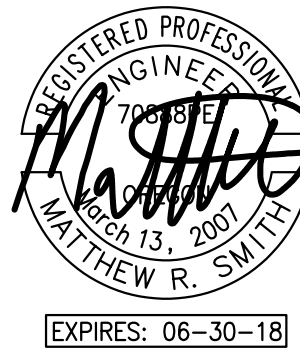


8
S4.0 ROOF AT MECH. EQUIPMENT WELL ELEVATION
3/4" = 1'-0"

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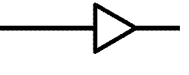
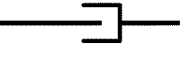
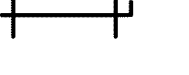
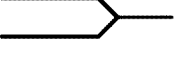
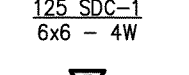
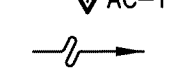
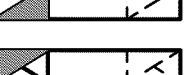
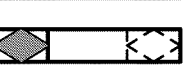
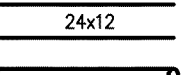
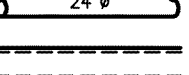
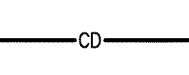
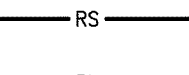
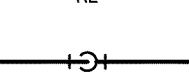
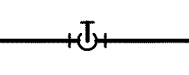
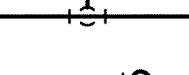
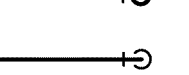
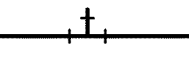
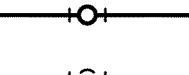
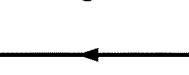
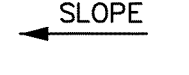
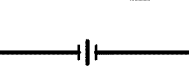
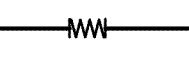
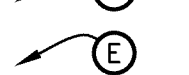


PROJECT NO: P-2195-17
DRAWN: SDW
CHECKED: MRS
DATE: 09-15-17



STRUCTURAL WALL
SECTIONS & DETAILS

S4.0

MECHANICAL SYMBOLS LIST		
SYMBOL	ABBR.	DESCRIPTION
		DUCT TRANSITION
		DUCT DROP/RISE
		MANUAL DAMPER
		DUCTWORK – DOUBLE LINE SYMBOL TO SINGLE LINE SYMBOL
		DUCT WITH RADIUS LBOW
		DUCT WITH RECTANGULAR ELBOW AND TURNING VANES
		TAKE-OFF WITH TWIST-LOCK FITTING
		AIR FLOW (CFM) – TYPE / NECK SIZE – PATTERN
		THERMOSTAT WITH ZONE/UNIT CONTROLLED
		DIRECTION OF AIR FLOW
		SUPPLY DUCT UP AND DOWN
		RETURN DUCT UP AND DOWN
		EXHAUST DUCT UP AND DOWN
		OUTSIDE AIR DUCT UP AND DOWN
		RECTANGULAR DUCT – 1ST DIMENSION IS SIDE SHOWN
		ROUND DUCT
		DUCT WITH INTERNAL LINER
	CD	COOLING COIL CONDENSATE DRAIN
	RS	REFRIGERANT SUCTION PIPE
	RL	REFRIGERANT LIQUID PIPE
		VERTICAL PIPE DROP OR RISER
		PIPE TAKE OFF – UP
		PIPE TAKE OFF – DOWN
		90 DEGREE ELBOW UP
		90 DEGREE ELBOW DOWN
		BRANCH TEE
		TEE UP
		TEE DOWN
		DIRECTION OF FLOW
		SLOPE PIPE DOWN IN DIRECTION OF ARROW
		BREAK IN LINE – SHOWN FOR CLARITY
		PIPE CAP
		PIPE UNION
		FLEXIBLE PIPE CONNECTOR
	SDC	SUPPLY DIFFUSER CEILING
	SRW	SUPPLY REGISTER WALL
	RGC	RETURN GRILLE CEILING
	RGW	RETURN GRILLE WALL
	EGC	EXHAUST GRILLE CEILING
	TGC	TRANSFER GRILLE CEILING
	HP	HEAT PUMP
	AC	AIR CONDITIONING UNIT
	CU	CONDENSING UNIT
	ERV	ENERGY RECOVERY VENTILATOR
	FC	FAN COIL UNIT
	EF	EXHAUST FAN
	AFF	ABOVE FINISHED FLOOR
	AD	ACCESS DOOR
	OSA	OUTSIDE AIR
	SA	SUPPLY AIR
	RA	RETURN AIR
	EA	EXHAUST AIR
	(R)	REMOVE
	(E)	EXISTING
		DETAIL & SHEET NUMBER
		KEYED NOTE REFERENCE
		MAINTENANCE ACCESS AREA

VARIABLE REFRIGERANT FLOW HEAT PUMPS - INDOOR UNITS																			
TAG	MODEL NO.	LOCATION	TYPE	NOMINAL COOLING CAPACITY (BTU/HR)	NOMINAL HEATING CAPACITY (BTU/HR)	COOLING DESIGN ENTERING TEMP DB/WB (DEG F)	HEATING DESIGN ENTERING TEMP DB/WB (DEG F)	CORRECTED CAPACITY				REFRIG PIPE DIM LIQUID/SUCTION (IN)	FAN AIRFLOW (CFM) (LOW-MID-HIGH)	MAX FAN ESP SETTING 208V (IN WG)	VOLTAGE/PHASE	ELECTRICAL MCA/MOCP	APPROX WEIGHT (LBS)	NOTES	
								COOLING DIVERSITY FULL/PARTIAL (SEE NOTE 4)	COOLING TOTAL CAPACITY (BTU/HR)	COOLING SENSIBLE CAPACITY (BTU/HR)	HEATING DIVERSITY FULL/PARTIAL (SEE NOTE 4)	HEATING CAPACITY (BTU/HR)							
FC-1	PEFY-P12NMAU-E3	LARGE CONFERENCE	CEILING CONCEALED TYPE (DUCTED)	12,000	13,500	80/67	70	FULL DEMAND	10,329	7,675	FULL DEMAND	8,024	1/4 / 1/2	265-318-371	0.6	208V/1-PHASE	1.2(208V) / 15	55	(1) (2) (3) (4) (5)
FC-2	PEFY-P06NMAU-E3	BREAK ROOM	CEILING CONCEALED TYPE (DUCTED)	8,000	9,000	80/67	70	FULL DEMAND	6,886	6,001	FULL DEMAND	5,349	1/4 / 1/2	212-265-300	0.6	208V/1-PHASE	1.05(208V) / 15	55	(1) (2) (3) (4) (5)
FC-3	PEFY-P18NMAU-E3	LOBBY	CEILING CONCEALED TYPE (DUCTED)	18,000	20,000	80/67	70	FULL DEMAND	15,494	12,767	FULL DEMAND	11,887	1/4 / 1/2	424-512-600	0.6	208V/1-PHASE	1.56(208V) / 15	70	(1) (2) (3) (4) (5)
FC-4	PEFY-P12NMAU-E3	SMALL CONFERENCE	CEILING CONCEALED TYPE (DUCTED)	15,000	17,000	80/67	70	FULL DEMAND	12,912	10,578	FULL DEMAND	10,104	1/4 / 1/2	353-424-494	0.6	208V/1-PHASE	1.45(208V) / 15	70	(1) (2) (3) (4) (5)
FC-5	PEFY-P12NMAU-E3	BUILDING OFFICIAL	CEILING CONCEALED TYPE (DUCTED)	12,000	13,500	80/67	70	FULL DEMAND	11,718	8,238	FULL DEMAND	8,823	1/4 / 1/2	265-318-371	0.6	208V/1-PHASE	1.2(208V) / 15	55	(1) (2) (3) (4) (5)
FC-6	PEFY-P12NMAU-E3	DIRECTOR	CEILING CONCEALED TYPE (DUCTED)	15,000	17,000	80/67	70	FULL DEMAND	12,912	10,578	FULL DEMAND	10,104	1/4 / 1/2	353-424-494	0.6	208V/1-PHASE	1.45(208V) / 15	70	(1) (2) (3) (4) (5)
FC-7	PEFY-P12NMAU-E3	OPEN OFFICE	CEILING CONCEALED TYPE (DUCTED)	15,000	17,000	80/67	70	FULL DEMAND	12,912	10,578	FULL DEMAND	10,104	1/4 / 1/2	353-424-494	0.6	208V/1-PHASE	1.45(208V) / 15	70	(1) (2) (3) (4) (5)
FC-8	PEFY-P15NMAU-E3	PLANNER	CEILING CONCEALED TYPE (DUCTED)	15,000	17,000	80/67	70	FULL DEMAND	14,647	11,250	FULL DEMAND	11,110	1/4 / 1/2	353-424-494	0.6	208V/1-PHASE	1.45(208V) / 15	70	(1) (2) (3) (4) (5)
FC-9	PEFY-P48NMAU-E3	GYM	CEILING CONCEALED TYPE (DUCTED)	48,000	54,000	80/67	70	FULL DEMAND	46,871	35,174	FULL DEMAND	35,291	3/8 / 7/8	989-1201-1412	0.6	208V/1-PHASE	3.51(208V) / 15	90	(1) (2) (3) (4) (5)
NOTES: BASIS OF DESIGN: MITSUBISHI (1) NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67 DEG F (DB/WB), OUTDOOR OF 95 DEG F (DB). (2) NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70 DEG F (DB), OUTDOOR OF 43 DEG F (WB). (3) SEE OUTDOOR UNIT SCHEDULE FOR OUTDOOR AMBIENT CONDITIONS, CONNECTED CAPACITY, AND OTHER FACTORS ASSOCIATED WITH CORRECTED CAPACITIES. (4) FULL DEMAND CORRECTED CAPACITY INCLUDES DE-RATE ASSOCIATED WITH INDOOR VS. OUTDOOR CONNECTED CAPACITY INDICATED ON OUTDOOR UNIT SCHEDULE FOR ASSOCIATED SYSTEM. PARTIAL CORRECTED CAPACITY ASSUMES SUFFICIENT DIVERSITY EXISTS SUCH THAT THE CONNECTED CAPACITY DE-RATE DOES NOT APPLY. (5) SEE OUTDOOR UNIT SCHEDULE FOR CONTROLS AND SEQUENCE OF OPERATIONS.																			

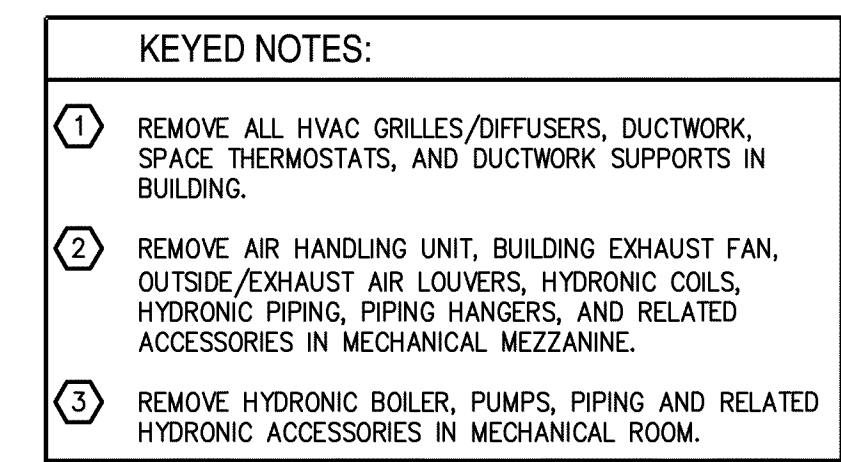
VARIABLE REFRIGERANT FLOW HEAT PUMPS - OUTDOOR UNITS																			
TAG	MODEL NO.	LOCATION	MODULES	NOMINAL COOLING CAPACITY (BTU/HR)	NOMINAL HEATING CAPACITY (BTU/HR)	COOLING EFFICIENCY IEER/IEER	HEATING COP @ 47 DEG F	NOM SYSTEM CONNECTED CAPACITY (% OF NOM)	DESIGN COOLING OUTDOOR TEMP DB (DEG F)	DESIGN HEATING OUTDOOR TEMP WB (DEG F)	REFRIG PIPE DIM HIGH/LOW PRESSURE (IN)	CORRECTED COOLING TOTAL CAPACITY (BTU/HR)	CORRECTED HEATING CAPACITY (BTU/HR)	INVERTER DRIVEN COMPRESSOR TYPE / QUANTITY	VOLTAGE / PHASE	ELECTRICAL-PER MODULE		APPROX WEIGHT (LBS)	NOTES
																MCA	MOCP		
HP-1	PURY-P168TLMU-A	ROOF	P168	168,000	188,000	19.8/11.2	3.49	100%	89	15.5	3/4 / 1-1/8	237,284	166,995	SCROLL/1	208 / 3-phase	68	110	1400	(1) (2) (3) (4) (5)
NOTES: BASIS OF DESIGN: MITSUBISHI (1) NOMINAL COOLING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 80/67 DEG F (DB/WB), OUTDOOR OF 95 DEG F (DB) (2) NOMINAL HEATING CAPACITIES ARE BASED ON INDOOR COIL EAT OF 70 DEG F (DB), OUTDOOR OF 43 DEG F (WB) (3) EFFICIENCY VALUES FOR IEER, IEER, COP ARE BASED ON AHRI 1230 TEST METHOD FOR MIXTURE OF DUCTED & NON-DUCTED INDOOR UNITS. (4) PROVIDE 24-INCH RAISED BASE PER MANUFACTURER'S INSTALLATION REQUIREMENTS. (5) PROVIDE FACTORY PROGRAMMABLE THERMOSTATS AND CONTROLLER FOR HEAT PUMP UNIT. SEQUENCE OF OPERATION: SPACE TEMPERATURE IS TO BE MAINTAINED BY THE PROGRAMMABLE THERMOSTAT FOR EACH ZONES' FAN COIL UNIT. VRF HEAT PUMP UNIT WILL OPERATE BASED ON MANUFACTURER'S PACKAGED CONTROLS AND AS DETERMINED BY THE HEATING OR COOLING LOAD OF THE CONNECTED FAN COIL UNITS. SYSTEM TO RUN DURING SCHEDULED OCCUPIED HOURS. INTERLOCK ERV UNIT TO RUN WHENEVER THE VRF SYSTEM IS ENERGIZED.																			

VARIABLE REFRIGERANT FLOW - BRANCH CONTROLLER								
TAG	MODEL NO.	TYPE	NUMBER OF PORTS	MAX CONNECTED ALL BRANCHES	VOLTAGE / PHASE	ELECTRICAL MCA	APPROX WEIGHT (LBS)	NOTES
BC-1	CMB-P1010NU-HA1	SINGLE	10	194,000	208/1	1.6	150	(1)
NOTES: BASIS OF DESIGN: MITSUBISHI (1) INCLUDE SERVICE VALVES.								

ELECTRIC DUCT HEATERS											
TAG	MODEL NO.	LOCATION	SERVICE	CFM	SIZE (IN)		CAPACITY (KW)	VOLT	PHASE	STAGES	REMARKS
					FL	FH					
EDH-1	HF	ATTIC	BATHROOMS	400	12	10	3.3	208	1	1	[A] [B]
NOTES: BASIS OF DESIGN: MARKEL [A] AIRFLOW SWITCH [B] DUCT MOUNTED THERMOSTAT											

AIR INLETS & OUTLETS				
TAG	MODEL	MATERIAL	MOUNTING TYPE	SIZE
SDC-1	PRICE - SMDA	STEEL	LAY-IN	SEE PLANS
SDC-2	PRICE - SMDA	STEEL	SURFACE	SEE PLANS
SRW-1	PRICE - 520D	STEEL	DUCT	SEE PLANS
RGC-1	PRICE - PDDR	STEEL	LAY-IN	SEE PLANS
RGC-2	PRICE - PDDR	STEEL	SURFACE	SEE PLANS
RGW-1	PRICE-630	STEEL	SURFACE	SEE PLANS
EGC-1	PRICE - PDDR	STEEL	LAY-IN	SEE PLANS
EGC-2	PRICE - PDDR	STEEL	SURFACE	SEE PLANS
TGC-1	PRICE - PDDR	STEEL	SURFACE	SEE PLANS

VENTILATION AIR COMPLIANCE																
TAG	ROOM NUMBER	SPACE TYPE	USE AREA (SQ. FT.)	ZONE POPULATION	PEOPLE OA RATE - CFM / PERSON	AREA OA RATE - CFM / SF	ZONE DISTRIBUTION EFFECTIVENESS	OS AIRFLOW TO ZONE	PRIMARY ZONE CFM	PRIMARY OS FRACTION	SYSTEM POPULATION	OCCUPANT DIVERSITY	UNCORRECTED OS CFM	SYSTEM VENTILATION EFFICIENCY	MINIMUM OA - CFM	TOTAL OA FOR UNIT - CFM
FC-1	113	LARGE CONF.	498	10	5	0.06	0.8	80	370	0.22	10	1	80	0.8	100	100
	FC-1 SYSTEM															
FC-2	114	BREAK	206	3	5	0.06	0.8	27	300	0.09	3	1	27	0.8	34	50
	FC-2 SYSTEM															
FC-3	108	FRONT DESK	344	2	5	0.06	0.8	31	150	0.21	2	1	75	0.8	94	100
	109	LOBBY	786	0	-	0.06	0.8	44	450	0.10						
FC-3 SYSTEM																
FC-4	102	COPY ROOM	119	1	5	0.06	0.8	12	130	0.09	7	1	57	0.8	71	100
	103	SMALL CONF.	247	6	5	0.06	0.8	45	240	0.19						
FC-4 SYSTEM																
FC-5	104	BUILDING OFFICIAL	180	1	5	0.06	0.8	16	130	0.12	3	1	37	0.8	46	50
	105	OFFICE SPACE	180	2	5	0.06	0.8	21	240	0.09						
FC-5 SYSTEM																
FC-6	105	OFFICE SPACE	180	2	5	0.06	0.8	21	240	0.09	3	1	37	0.8	46	50
	106	DIRECTOR	181	1	5	0.06	0.8	16	130	0.12						
FC-6 SYSTEM																
FC-7	105	OFFICE SPACE	955	4	5	0.06	0.8	77	371	0.21	4	1	77	0.8	97	100
FC-7 SYSTEM																
FC-8	105	OFFICE SPACE	280	3	5	0.06	0.8	32	494	0.06	3	1	32	0.8	40	50
	FC-8 SYSTEM															
FC-9	112	GYM	1793	18	20	0.06	0.8	468	1412	0.33	18	1	468	0.8	585	600
	FC-9 SYSTEM															
NOTES:																
REQUIREMENTS REFERENCED FROM ASHRAE STANDARD 62-2010																



IF THIS BAR DOES NOT MEASURE
1-INCH IN LENGTH, THEN THE
DRAWING IS NOT TO SCALE

CITY OF OREGON CITY

COMMUNITY DEVELOPMENT DEPT. TI
1232 LINN AVE OREGON CITY 97045

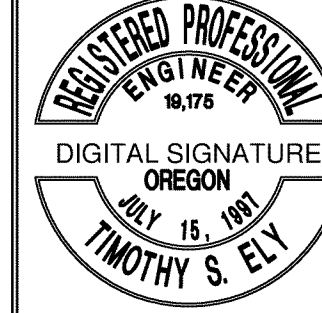


PROJECT NO: P-2195-

DRAWN:	C
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CHECKED: _____ A _____

DATE: 09-15-



EXPIRES 12/31/17
2100-524-17MD1.1.DWC

MECHANICAL
DEMOLITION FLOOR
PLAN

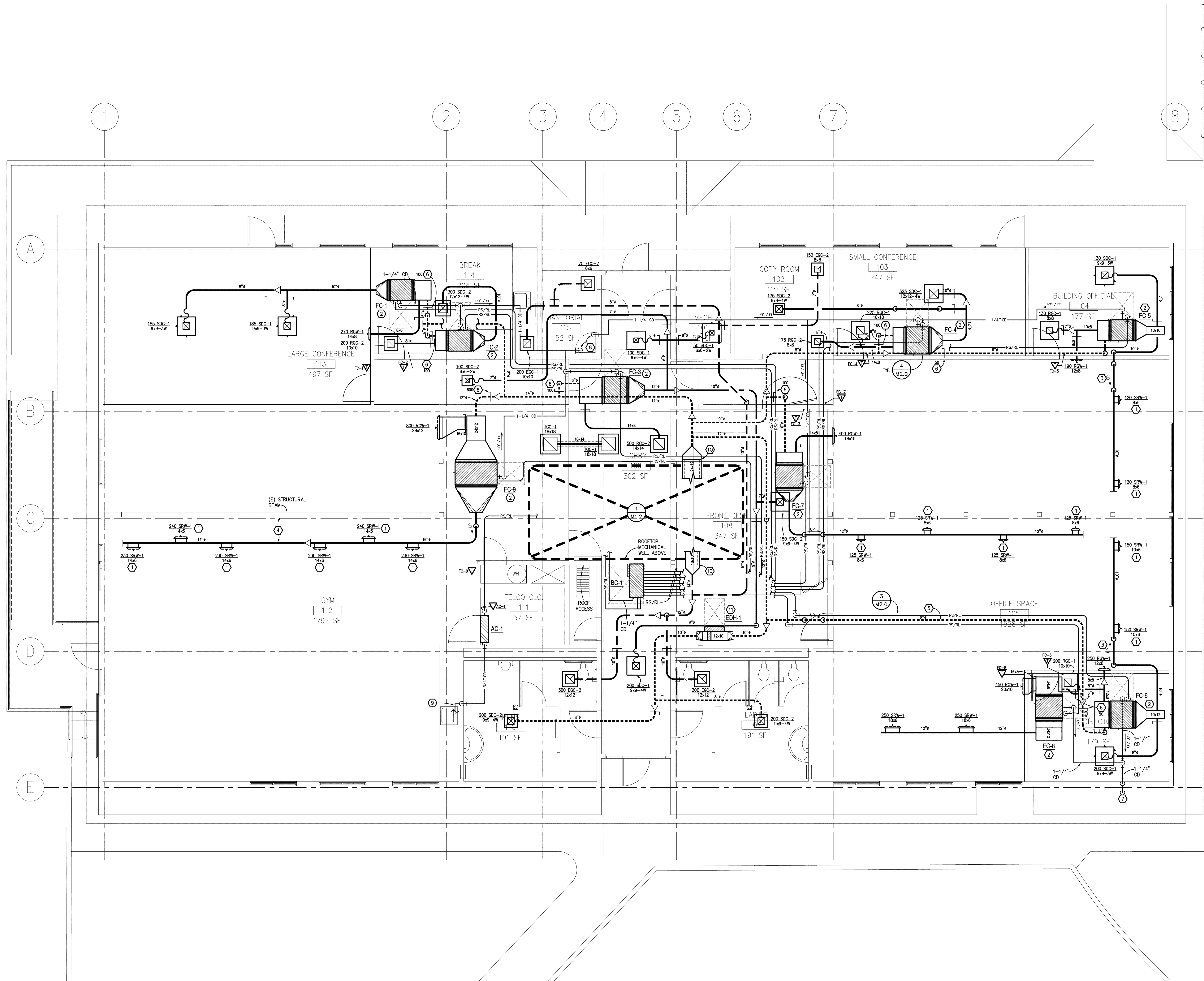
MD1.1



Engineering | Surveying | Consulting

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EUGENE, OR 97401
541.686.8478

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PORTLAND, OR 97204
503.961.6440



- GENERAL NOTES:**
1. FC CONDENSATE DRAIN PIPING IS 1-1/4" UNLESS OTHERWISE NOTED.
 2. FOLLOW MANUFACTURERS REQUIREMENTS FOR MINIMUM SERVICE CLEARANCES AROUND EQUIPMENT.
- KEYED NOTES:**
- 1 ANGLE SUPPLY GRILLE 30 DEGREES DOWN BELOW HORIZONTAL.
 - 2 MAINTAIN FAN COIL FILTER ACCESS.
 - 3 OFFSET DUCTWORK UP ABOVE WINDOW FRAME TO RENDER NOT VISIBLE FROM THE EXTERIOR. BOTTOM OF DUCT APPROXIMATELY 11"-2" AFF. VERIFY WINDOW HEIGHTS WITH ARCHITECTURAL.
 - 4 TOP OF DUCT TO MATCH BOTTOM OF BEAM ELEVATION.
 - 5 ROUTE DUCTWORK AS HIGH AS POSSIBLE TO STRUCTURE.
 - 6 BALANCE OSA TO FC UNIT TO CFM SHOWN.
 - 7 ROUTE CD PIPING DOWN WITHIN WALL. TERMINATE WITH DOWN-TURNED ELBOW APPROXIMATELY 6" ABOVE PLANTER AREA.
 - 8 1-1/4" CONDENSATE PIPING DOWN TO MOP SINK. TERMINATE 1" ABOVE FLOOD RIM OF SINK. SEAL CEILING PENETRATION AND COMPLETE WITH ESCUTCHEON.
 - 9 TERMINATE CONDENSATE PIPING UPSTREAM OF TAILPIECE AT EXISTING GYM SINK.
 - 10 STOP INTERNAL DUCT LINING INSIDE BUILDING ENVELOPE.
 - 11 MAINTAIN ACCESS SPACE OF DUCT HEATER. ROUTE CROSSING DUCTWORK ABOVE.

1 MECHANICAL FLOOR PLAN
SCALE: 1/4"=1'-0"

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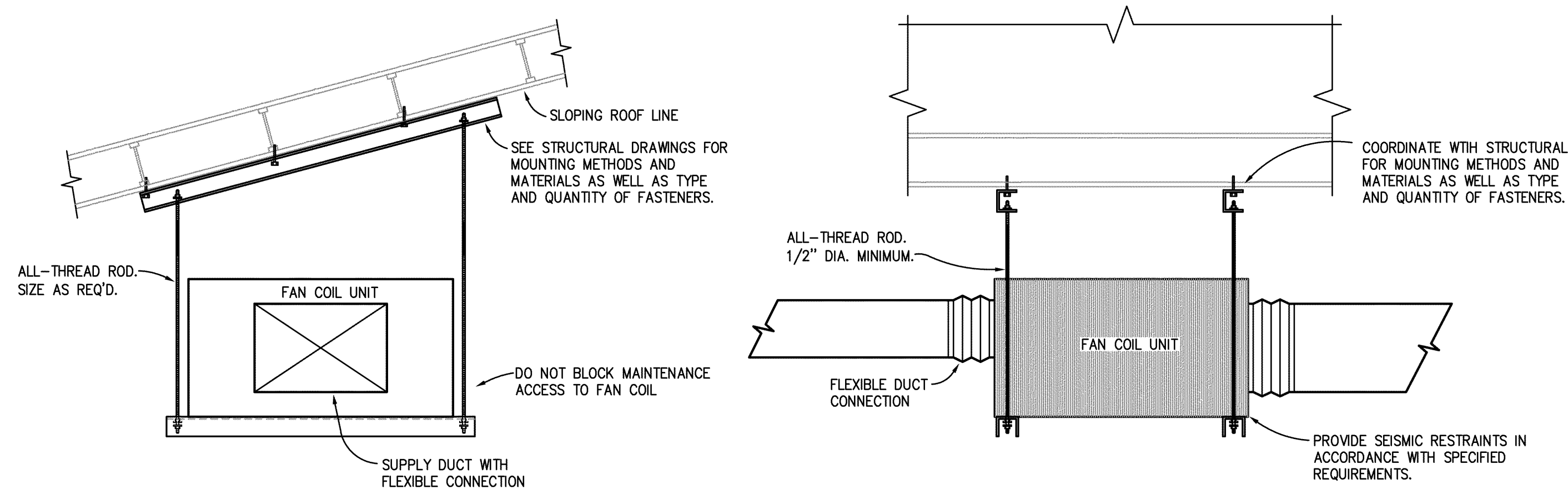
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DRAWN: CAS
CHECKED: ACS
DATE: 09-15-17

REGISTERED PROFESSIONAL
ENGINEER
DIGITAL SIGNATURE
TIMOTHY S. ELY
EXPIRES 12/31/17
2100-524-17M1.1.DWG

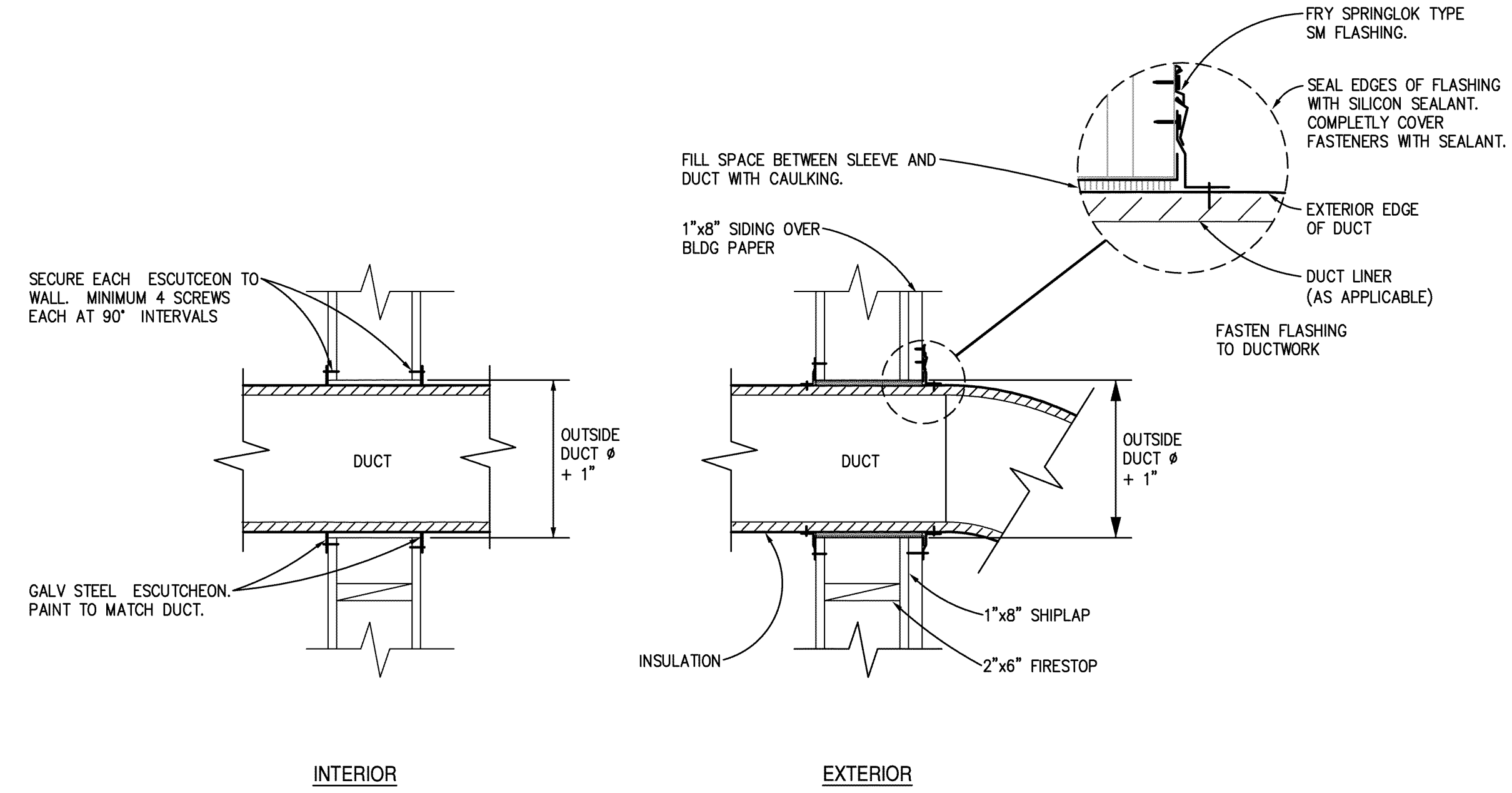
MECHANICAL FLOOR
PLAN

M1.1

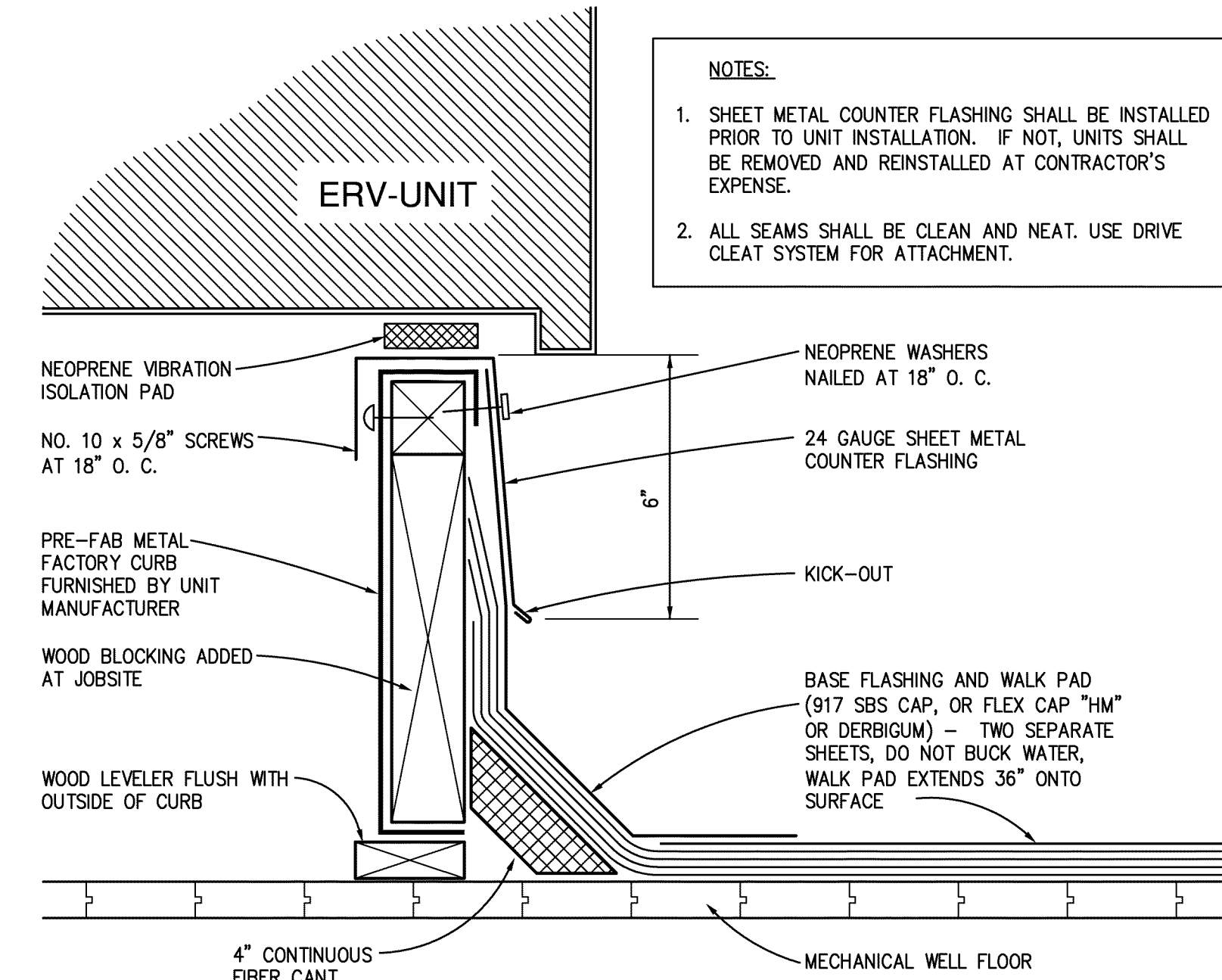




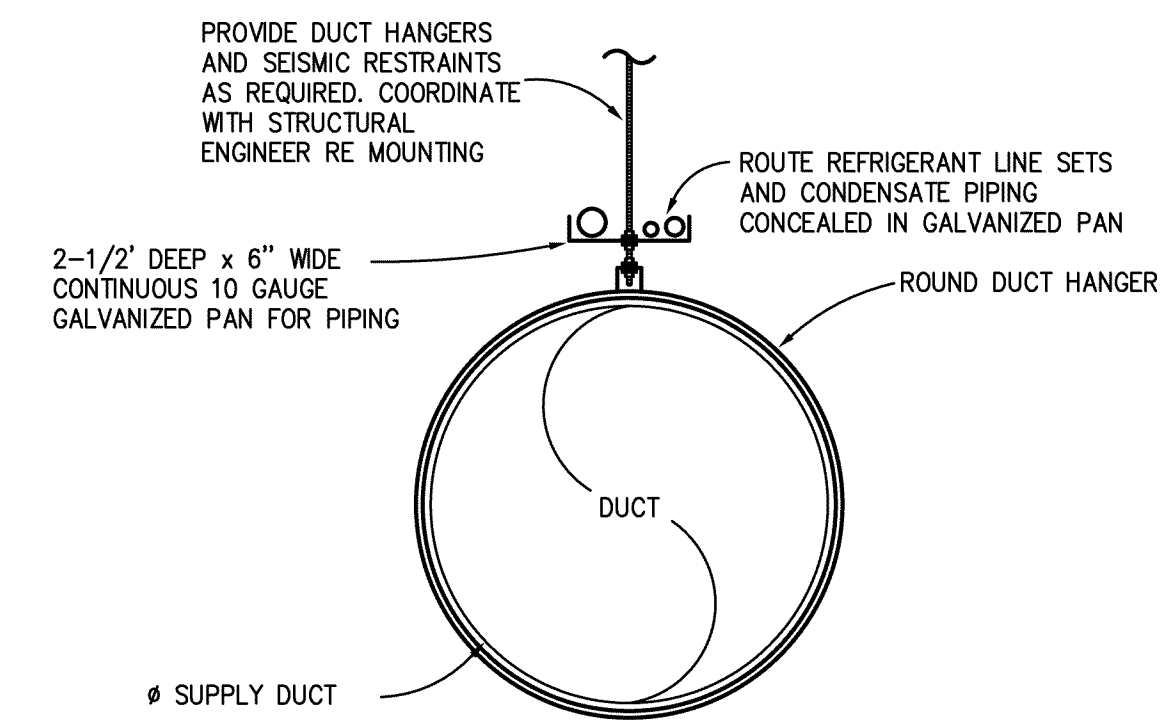
4 FAN COIL MOUNTING DETAIL
NO SCALE



1 DUCT PENETRATION THROUGH WALL
NO SCALE



2 AC UNIT FACTORY METAL CURB
NO SCALE



3 REFRIGERATION LINE SET ROUTING
NO SCALE