

PROJECT MANUAL

A New Office and Facilities Building for
North Beach Water District
2212 272nd Street
Ocean Park, WA 98640

"Bid/Construction Set"
June 1, 2015

Prepared By:

David E. Jensen, Architect
103 Pacific Avenue South, P.O. Box 6
Long Beach, WA 98631
Ph (360) 642-3507
Fax (360) 642-8636

TABLE OF CONTENTS

SECTIONS	PAGES
DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS	
SECTION 001116 - INVITATION TO BID / BID DOCUMENTS	2
SECTION 002113 - INSTRUCTIONS TO BIDDERS	4
SECTION 004100 - BID FORM	2
SECTION 005200 - AGREEMENT FORM	1
DIVISION 01 - GENERAL REQUIREMENTS	
SECTION 011100 - SUMMARY	2
SECTION 012300 - ALTERNATES	1
SECTION 012400 - ADMINISTRATIVE PROCEDURE	4
SECTION 012900 - PAYMENT PROCEDURES	1
SECTION 014000 - QUALITY REQUIREMENTS	3
SECTION 017700 - CLOSE-OUT PROCEDURES AND SUBMITTALS	4
DIVISION 03 - CONCRETE	
SECTION 033000 - CAST-IN-PLACE CONCRETE	8
DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES	
SECTION 061000 - ROUGH CARPENTRY	5
SECTION 061600 - SHEATHING	3
SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES	5
SECTION 062013 - EXTERIOR FINISH CARPENTRY	2
SECTION 064600 - WOOD TRIM	5
SECTION 066400 - PLASTIC PANELING	2
DIVISION 07 - THERMAL AND MOISTURE PROTECTION	
SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING	4
SECTION 071800 - TRAFFIC COATINGS	3
SECTION 072100 - THERMAL INSULATION	3
SECTION 072500 - WEATHER BARRIERS	2
SECTION 073113 - ASPHALT SHINGLES	5
SECTION 074646 - FIBER-CEMENT SIDING	3
SECTION 076200 - SHEET METAL FLASHING AND TRIM	8
SECTION 079200 - JOINT SEALANTS	8
DIVISION 08 - OPENINGS	
SECTION 081213 - HOLLOW METAL FRAMES	5
SECTION 081416 - FLUSH WOOD DOORS	4
SECTION 083113 - ACCESS DOORS AND FRAMES	3
SECTION 083313 - COILING COUNTER DOORS	4
SECTION 083323 - OVERHEAD COILING DOORS	4
SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS	7
SECTION 085313 - VINYL WINDOWS	4
SECTION 087000 - HARDWARE AND SPECIALTIES	6
SECTION 088000 - GLAZING	7

DIVISION 09 - FINISHES

SECTION 092900 - GYPSUM BOARD	5
SECTION 095113 - ACOUSTICAL PANEL CEILINGS	3
SECTION 096516 - RESILIENT SHEET FLOORING	4
SECTION 096813 - TILE CARPETING	4
SECTION 099113 - EXTERIOR PAINTING	4
SECTION 099123 - INTERIOR PAINTING	4
SECTION 099300 - STAINING AND TRANSPARENT FINISHING	4

DIVISION 10 - SPECIALTIES

SECTION 101400 - SIGNAGE	2
SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES	5

DIVISION 12 - FURNISHINGS

SECTION 123530 - RESIDENTIAL CASEWORK	3
SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS	4

DIVISION 22 - PLUMBING

SECTION 220500 - COMMON PLUMBING REQUIREMENTS	12
SECTION 220523 - VALVES	2
SECTION 220529 - PIPE SUPPORTS	2
SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT	2
SECTION 220700 - PLUMBING INSULATION	3
SECTION 221117 - PEX PIPING	2
SECTION 221119 - DOMESTIC WATER SPECIALTIES	1
SECTION 221316 - SANITARY WASTE AND VENT PIPING	2
SECTION 223300 - ELECTRIC WATER HEATERS	2
SECTION 224000 - PLUMBING FIXTURES AND APPURTENANCES	4

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

SECTION 230500 - GENERAL PROVISIONS	11
SECTION 230519 - METERS AND GAUGES FOR HVAC PIPING - ALTERNATE	1
SECTION 230523 - VALVES - ALTERNATE	2
SECTION 230529 - PIPE SUPPORTS - ALTERNATE	2
SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT	1
SECTION 230593 - TESTING, ADJUSTING AND BALANCING FOR HVAC	2
SECTION 230713 - HVAC DUCT INSULATION	3
SECTION 230719 - HVAC PIPE INSULATION	2
SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC	4
SECTION 232113 - HYDRONIC PIPING - ALTERNATE	2
SECTION 232116 - HYDRONIC SPECIALTIES - ALTERNATE	1
SECTION 233113 - METAL DUCTS	3
SECTION 233116 - FLEXIBLE DUCT	2
SECTION 233300 - AIR DUCT ACCESSORIES	3
SECTION 233429 - HVAC POWER VENTILATORS	1
SECTION 233713 - DIFFUSERS AND GRILLES	2
SECTION 233724 - WALL LOUVERS AND VENT	1
SECTION 234100 - FILTERS - ALTERNATE	1

DIVISION 26 - ELECTRICAL

SECTION 260501 - GENERAL PROVISIONS	5
SECTION 260502 - ELECTRICAL SYSTEMS SCHEDULE	1
SECTION 260503 - CODES AND STANDARDS	2
SECTION 260520 - BASIC MATERIALS AND METHODS	8

SECTION 260526 - GROUNDING	2
SECTION 260700 - COMMUNICATIONS AND SIGNAL SYSTEMS	1
SECTION 262417 - SERVICE AND DISTRIBUTION	4
SECTION 265100 - LIGHTING FIXTURES	4

DIVISION 31 - EARTHWORK

SECTION 311100 - CLEARING AND GRUBBING	4
SECTION 311300 - SELECTIVE TREE AND SHRUB REMOVAL	3
SECTION 312000 - EARTH MOVING	2
SECTION 312500 - EROSION CONTROL	2

DIVISION 32 - EXTERIOR IMPROVEMENTS

SECTION 321216 - ASPHALT PAVING	6
SECTION 321713 - PARKING BUMPERS	1
SECTION 321723 - PAVEMENT MARKINGS	2

DIVISION 33 - UTILITIES

SECTION 334400 - STORM DRAINAGE AND DOWNSPOUTS	1
--	---

SECTION 001116 - INVITATION TO BID / BID DOCUMENTS

Sealed bids for the New Offices and Facilities Building will be received by Bill Neal, General Manager, North Beach Water District, for the Owner, North Beach Water District, at 25902 Vernon Avenue, Ocean Park, WA 98640 until 2:00 p.m., Pacific Standard Time, on Thursday, **June 18, 2015** at which time and place they will be publicly opened and read aloud. No bids will be accepted after this time.

In general, the nature of the project consists of construction of a 2200 SF wood-framed office building with adjoining 4224SF wood-framed facilities building and adjacent parking area.

Contract documents may be reviewed at the following locations:

David E. Jensen Architect, 103 Pacific Ave S., Long Beach, WA 98631
North Beach Water District, 25902 Vernon Avenue, Ocean Park, WA 98640

The Project Manual and The Construction Drawings are available
@ <http://davidjensenarchitect.com/northbeachwaterdistrict>. General Contractors intending to bid project should email Architect at dejarch@willapabay.org to ensure they are notified of any subsequent documents related to the project.

All bidders shall comply with the provisions of RCW 39.04.010, RCW 39.04.260, RCW 39.12.010, RCW 39.12.020, RCW 39.12.030 AND WAC 296-127-010. In addition, the selected contractor and their subcontractor(s) are required to have a State of Washington Business License.

There will be a pre-bid conference for all bidders planning to submit a bid on Monday June 8, 2015 starting at 2:00 p.m. in the conference room at the North Beach Water District offices. It is highly recommended that anyone planning to bid this project attend the pre-bid conference. This pre-bid conference is not mandatory and any statements made by the Owner's representatives at the conference are not binding upon the Owner unless confirmed by written addendum.

Bid security in the amount of not less than 5% of the bid must accompany each bid in accordance with the Instructions to Bidders. The Owner reserves the right to reject any bid not in compliance with all prescribed public bidding procedures and requirements, and may reject, for good cause, any or all bids upon a finding of the Owner that it is in the public interest to do so. The Owner reserves the right to waive any bid irregularities or informalities. No bidder may withdraw or modify the bidder's bid after the hour set for the opening thereof, until after the lapse of 30 days from the bid opening.

By Order of the

North Beach Water District

1.1 ADMINISTRATIVE DOCUMENTS

- A. 001116 BID DOCUMENTS
- B. 002113 INSTRUCTIONS TO BIDDERS
- C. 004100 BID FORM
- D. 005200 AGREEMENT FORM

1.2 PLANS

- A. ARCHITECTURAL DRAWINGS 1 – 21
- B. CIVIL DRAWINGS C1 – C2
- C. STRUCTURAL DRAWINGS S 0 – S 7
- D. ELECTRICAL DRAWINGS E1 – E8
- E. MECHANICAL AND PLUMBING DRAWINGS M0.1, M2.1, M2.2, P0.1, P2.1

1.3 SPECIFICATIONS

- A. See SPECIFICATIONS: PROJECT MANUAL INDEX for detailed list of included specifications

END OF SECTION 001116

SECTION 002113 - INSTRUCTIONS TO BIDDERS

PART 1 -

A. THE WORK

NEW OFFICES AND FACILITIES BUILDING
NORTH BEACH WATER DISTRICT
2212 272ND St.
Ocean Park, WA 98631

B. SECURING DOCUMENTS

1. Bona fide general contract bidders may secure copies of the proposed Contract Documents from the Architect on the following basis:
2. The Project Manual and The Construction Drawings are available at www.davidjensenarchitect.com/northbeachwaterdistrict. General Contractors intending to bid project should email Architect at dejarch@willapabay.org to ensure they are notified of any subsequent documents related to the project.

C. BID FORM

In order to receive consideration, make bids in strict accordance with the following:

1. Make bids upon the forms provided therefore, properly signed and with all items filled out. Do not detach from Project Manual. Do not change the wording of the bid form, and do not add words to the bid form. Unauthorized conditions, limitations, or provisions attached to the bid will be cause for rejection of the bid. If alterations by erasure or interlineation are made for any reason, explain over such erasure or interlineation with a signed statement from the bidder.
2. No bids received after the time fixed for receiving them will be considered. Late bids will be returned to the bidder unopened.
3. Address bids to the Owner, and deliver to the address given in the invitation to bid on or before the day and hour set for opening the bids. Enclose each bid in a sealed envelope bearing the title of the Work, the name of the bidder, and the date and hour of the bid opening. Submit only the original signed copy of the bid attached to the Project Manual. It is the sole responsibility of the bidder to see that his bid is received on time.

D. BONDS

1. Bid security in the amount stated in the Invitation to Bid must accompany each bid attached to Project Manual. The successful bidder's security will be retained until he has signed the Contract and has furnished the required Certificates of Insurance. Bid bonds must be submitted on AIA Document A310.

2. The Owner reserves the right to retain the security of the next two low bidders until the successful bidder enters into the Contract or until 30 days after bid opening, whichever is sooner. Other bid security will be returned as soon as practicable. If any bidder refuses to enter into a Contract, the Owner may retain his bid security as liquidated damages but not as a penalty.
3. Prior to signing the Contract, the Owner will require the successful bidder to secure and post a Performance Bond and Payment Bond, each in the amount of 100% of the Contract Sum. Said bonds shall be issued by Surety acceptable to the Owner. Costs of such bonds will be included in the agreed Contract sum.

E. EXAMINATION OF DOCUMENTS AND SITE OF WORK

1. Before submitting a bid, each bidder shall examine the Drawings carefully, shall read the Specifications and all other proposed Contract Documents, and shall visit the site of the Work. Each bidder shall fully inform himself prior to bidding as to existing conditions and limitations under which the Work is to be performed, and shall include in his bid a sum to cover the cost of items necessary to perform the Work as set forth in the proposed Contract Documents. No allowance will be made to a bidder because of lack of such examination or knowledge. the submission of a bid will be considered as conclusive evidence that the bidder has made such examination.

F. PRE-BID CONFERENCE AND WALKTHROUGH

1. See Section 01240 Par. 1.2

G. PROOF OF COMPETENCY OF BIDDER

1. A bidder may be required to furnish evidence satisfactory to the Owner that he and his proposed subcontractors have sufficient means and experience in the types of work called for to assure completion of the Contract in a satisfactory manner. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the Owner that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein.

H. WITHDRAWAL OF BIDS

1. A bidder may withdraw his bid, either personally or by written request, at any time prior to the scheduled time for opening bids.
2. No bidder may withdraw his bid for a period of thirty (30) calendar days after the date set for opening thereof, and bids shall be subject to acceptance by the Owner during this period.

I. AWARD OR REJECTION OF BIDS

1. The Contract, if awarded, will be awarded to the responsible bidder based on Contract Sum and proof of competency (para. G), subject to the Owner's right to reject any or all bids and to waive informality in the bids and in the bidding.
2. The North Beach Water District Commission will consider all bids within ten (10) days of bid openings.

J. LAWS AND REGULATIONS

1. The bidder's attention is directed to the fact that all federal, state and local laws, ordinances, rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout, and they will be deemed to be included in the same as though herein written out in full. All bidders shall comply with the provisions of State of Washington (Prevailing Wage Rates).

K. PREVAILING WAGES

1. This project is a Public Works project and is subject to prevailing wage laws, Public work is all work, construction, alteration, repair or improvement that is executed at the cost of the state or any other local public agency. This includes, but is not limited to, demolition, remodeling, renovation, road construction, building construction, ferry construction and utilities construction. RCW 39.04.010
2. Prevailing Wage is defined as the hourly wage, usual benefits and overtime, paid in the largest city in each county, to the majority of workers, laborers, and mechanics. Prevailing wages are established, by the Washington State Department of Labor and Industries, for each trade and occupation employed in the performance of public work. They are established separately for each county, and are reflective of local wage conditions.
3. The Contractor will be responsible for obtaining and paying the proper wage rates this project.

L. EXECUTION OF AGREEMENT

1. The form of Agreement which the successful bidder will be required to execute is included in the Project Manual.
2. The bidder to whom the Contract is awarded shall, within ten (10) calendar days after notice of award of contract and receipt of Agreement forms from the Owner, sign and deliver required copies to the Owner.
3. At or prior to delivery of the signed Agreement, the bidder to whom the Contract is awarded shall deliver to the Owner those Certificates of Insurance required by the Contract Documents and such Performance Bond and Labor and Material Payment Bond as are required by the Owner.
4. Bonds and Certificates of Insurance shall be approved by the Owner before the successful bidder may proceed with the Work. Failure or refusal to provide Bonds or Certificates of Insurance in a form satisfactory to the Owner shall subject the successful bidder to loss of time from the allowable construction period equal to the time of delay in furnishing the required material.

M. SUBCONTRACTS

1. Any person, firm or party to whom it is proposed to award a subcontract under this contract must be acceptable to the Owner.
2. The contractor shall submit a list of all subcontractors to the Owner prior to starting work. The contractor shall notify the Owner of all changes in subcontractors.

N. INTERPRETATION OF CONTRACT DOCUMENTS PRIOR TO BIDDING

1. If any person contemplating submitting a bid for construction of the Work is in doubt as to the true meaning of any part of the proposed Contract Documents, or finds discrepancies in or omissions from any part of the proposed Contract Documents, he/she shall request interpretation from the Architect.
2. Interpretation or correction of proposed Contract Documents will be made only by Addendum and will be FAXed (if available to bidder), mailed or delivered to each general contract bidder of record. The Owner will not be responsible for any other explanations or interpretations of the proposed Contract Documents.

O. NOTICE TO PROCEED

1. The Notice to Proceed shall be issued within ten (10) days of the execution of the Agreement by the Owner. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the ten (10) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

P. CONSTRUCTION TIME LIMIT

1. There will be a construction time limit allowed for Substantial Completion of the Work under the Contract. The starting date shall be the date of written Notice to Proceed with the Work. The Work shall be Substantially Completed within the time limit provided in the Bid Form. Failure to do so shall result in penalties as hereinafter provided.

Q. LIQUIDATED DAMAGES

1. The Owner will suffer financial loss if the project is not Substantially Complete on the date set forth in the Contract Documents. The Contractor and the Contractor's Surety shall be liable for and shall pay to the Owner the sums hereinafter stipulated and fixed, agreed and liquidated damages for each calendar day or portion thereof of delay until the Work is Substantially Complete: Fifty dollars (\$50.00).

R. RETAINAGE

1. The Owner will retain a sum of 5% of the amount due the Contractor on account of progress payments, certified by the Architect, and hold the sum in trust for the Contractor until the satisfactory completion of the contract.

END OF SECTION 002113

SECTION 004100 - BID FORM

To: District Commissioners
North Beach Water District
29502 Vernon Ave. #C
Ocean Park, WA 98640

Having carefully examined instructions to bidders and the Contract Documents entitled: New Office and Facilities Building for North Beach Water District as prepared by David E. Jensen, Architect, and having visited the site and examined the conditions affecting the Work, the undersigned proposes to:

1. Complete the Work as required by the Contract Documents for the stipulated sum of:

Base Bid\$ _____
WSST\$ _____
Project Bid.\$ _____

Alternate No. 1\$ _____
WSST\$ _____
Alt. Total\$ _____

Alternate No. 2\$ _____
WSST\$ _____
Alt. Total\$ _____

2. Start the Work on the date of written notice to proceed.
3. Substantially Complete the Work within one hundred eighty (180) calendar days.

Notwithstanding any contrary provisions herein, the Owners shall retain the final 5% of the contract price due to the Contractor for a period of 30 days after final acceptance, at which time the final payment shall be made to the Contractor, unless liens or taxes remain unsatisfied, and/or compliance with the pertaining WAC is not certified. Owner shall disburse such funds when any applicable liens or taxes are satisfied.

If written notice of acceptance of this proposal is mailed or delivered to undersigned within time limit noted in Contract Documents after date of proposal submission or any time thereafter before this proposal is withdrawn, undersigned will, within ten (10) days after date of such mailing or delivering of such notice, execute and deliver Contract on North Beach Water District Public Works Contract form.

This proposal may be withdrawn at any time prior to the scheduled time for the opening of bids, or any authorized postponement thereof.

Enclosed is a certified check, cashier's check or bid bond in the amount of 5% of the base bid. (Cash deposits will not be accepted.)

Receipt of Addenda numbered _____ through _____ is hereby acknowledged.

Name of Firm: _____

Address: _____

City/State: _____ Zip: _____

Telephone: _____

State Contractor's License No.: _____

Note: If bidder is a corporation, write state of incorporation; and if a partnership, give full names and address of all partners below:

Signed: _____ Date: _____

END OF SECTION 004100

SECTION 005200 - AGREEMENT FORM

- A. North Beach Water District Public Works Contract will be used. The Agreement shall be completed prior to initiating the Work. A copy is on file at the District office at 25902 Vernon Avenue, Ocean Park, WA. 98640, as well as the Architect's office 103 Pacific Avenue, Long Beach, WA 98631.

END OF SECTION 000030

SECTION 007343 - WAGE RATE REQUIREMENTS

PART 1 - GENERAL

1.1 CONTRACT CONDITIONS

- A. All other Contract Documents, including Drawings, Specifications, Project Manual and General and Supplemental Conditions of the Contract, complement the requirements of the section.
- B. Other sections of this specification may relate to, and may impose additional work and/or additional materials upon this section. Coordinate any cross-referencing of Specification sections.
- C. The most current Schedule of Washington State Prevailing Wage Rates for Pacific County is included by reference under requirements of these Contract Documents except as amended or superseded by new current Prevailing Wage Rates, Codes, Laws, or other Governing Authorities.

1.2 REQUIREMENTS

- A. In accordance with Revised Code of Washington (RCW) 39.04.010 ff, Contractor and subcontractors shall pay employees for each trade or occupation, performing work, not less than the minimum, current Prevailing Wage Rate and shall comply in all respects to this or other requirements as defined by Washington State Department and Labor & Industries. Prevailing Wage information may be found at the following web page:

www.lni.wa.gov/TradesLicensing/PrevWage
- B. Prevailing Wage Rate is defined as the hourly wage and usual fringe benefits paid in the largest city in each county, to the majority of workers, laborers, and mechanics. Prevailing wage are established separately for each county and are reflective of local wage conditions.
 - 1. Contractor and subcontractors must pay a wage-and-fringe benefits package to workers that is equal to or exceeds the prevailing wage and prevailing fringe benefit amounts added together.
 - 2. Contractor and subcontractors must observe overtime, holiday, and Code provisions that are part of the Prevailing Wage Rate.
- C. Posting of Prevailing Wage Rates: Locate Prevailing Wage Rates in site office in clear and plain sight to all. Maintain information and replace damaged information in a timely manner.
- D. File "Statement of Intent to Pay Prevailing Wages," in accordance with provisions Section 00 73 14.16
- E. File "Affidavit of Wages Paid," in accordance with provisions Section 00 73 46.19

1.3 RETAINAGE

- A. Retainage of funds from each payment to Contractor will be withheld in an interest bearing account until conclusion of Project. Amount retained will be 5% percent of each payment, and is assumed to be sufficient to pay any unpaid wage claims, taxes and costs as well as attorney fees, should a claim against the bond and retainage fund be filed.
 - 1. Retainage will be held until Owner receives proof that all taxes and industrial insurance premiums due for the Work have been paid.
 - 2. Retainage may be paid after Owner has received approved releases from the Department of Labor & Industries (L&I) Industrial Insurance Program, the Department of Revenue (DOR) and the Employment Security Department (ESD) and all prevailing wage Affidavit of Wages Paid requirements of RCW 39.12.040 have been met.
 - 3. Questions regarding Retainage may be addressed to the following email:

ContractRelease@Lni.wa.gov

1.4 DISPUTE RESOLUTION

- A. In accordance with RCW 39.12.060, in case any dispute arises as to what the prevailing rates of wages for work of a similar nature and such dispute cannot be adjusted by the parties in interest, including labor and management representatives, the matter shall be referred for arbitration to the director of the department of labor and industries of the state and his or her decision therein shall be final and conclusive and binding on all parties involved in the dispute.

1.5 CERTIFIED PAYROLL RECORDS

- A. The Owner reserves the right under Washington Administrative Code (WAC) 296-127-320(2) to request and receive certified payroll records for work performed. At Owner's request, comply with filing certified payroll records with the L&I and with Owner.

- 1. Questions regarding Certified Payroll records may be addressed to the following:

pw1@lni.wa.gov

END OF SECTION 007343

SECTION 00 73 43.16 - INTENT TO PAY PREVAILING WAGE

PART 1 - GENERAL

1.1 CONTRACT CONDITIONS

- A. All other Contract Documents, including Drawings, Specifications, Project Manual and General and Supplemental Conditions of the Contract, complement the requirements of the section.
- B. Other sections of this specification may relate to, and may impose additional work and/or additional materials upon this section. Coordinate any cross-referencing of Specification sections.
- C. The most current Schedule of Washington State Prevailing Wage Rates for Pacific County is included by reference under requirements of these Contract Documents except as amended or superseded by new current Prevailing Wage Rates, Codes, Laws, or other Governing Authorities.

1.2 REQUIREMENTS

- A. In accordance with Section 00 73 43 and Revised Code of Washington (RCW) 39.12.040, Contractor and subcontractors shall pay employees for each trade or occupation, performing work, not less than the minimum, current Prevailing Wage Rate and shall comply in all respects to this or other requirements as defined by Washington State Department and Labor & Industries.
- B. Intent to Pay Prevailing Wages: Before payment is made by or on behalf of Owner of any sum or sums due on account of the contract, the contractor and subcontractor must submit a "Statement of Intent to Pay Prevailing Wages" to the Owner. The statement of intent to pay prevailing wages shall include:
 - 1. The contractor's registration number certificate number
 - 2. The prevailing rate of wage for each classification of workers entitled to prevailing wages under RCW 39.12.020 and the estimated number of workers in each classification
- C. The Owner will designate its representative to whom the Statement of Intent to Pay Prevailing Wages shall be submitted.
- D. The Statement of Intent to Pay Prevailing Wages shall be in a format approved by Department of Labor & Industry's Industrial Statistician.
 - 1. Submit every Statement of Intent to Pay Prevailing Wages for each subcontractor that performed the work with each initial Application for Payment and before payment is made.
- E. In accordance with Section 00 73 46.19 and RCW 39.12.040(2)(b), at conclusion of Project, Contractor and subcontractors shall submit to Owner "Affidavit of Wages Paid," as approved by Department of Labor & Industry's "industrial statistician," before Owner will release retainage and interest withheld.

PART 2 - PRODUCTS

- A. The form approved by the Washington State Department of Labor and Industries follows the Section.

END OF SECTION 00 73 43.16

SECTION 00 73 43.19 - AFFIDAVIT OF WAGES PAID

PART 1 - GENERAL

1.1 CONTRACT CONDITIONS

- A. All other Contract Documents, including Drawings, Specifications, Project Manual and General and Supplemental Conditions of the Contract, complement the requirements of the section.
- B. Other sections of this specification may relate to, and may impose additional work and/or additional materials upon this section. Coordinate any cross-referencing of Specification sections.
- C. The most current Schedule of Washington State Prevailing Wage Rates for Pacific County is included by reference under requirements of these Contract Documents except as amended or superseded by new current Prevailing Wage Rates, Codes, Laws, or other Governing Authorities.

1.2 REQUIREMENTS

- A. In accordance with Section 00 73 43 and Revised Code of Washington (RCW) 39.12.040, Contractor and subcontractors shall pay employees for each trade or occupation, performing work, not less than the minimum, current Prevailing Wage Rate and shall comply in all respects to this or other requirements as defined by Washington State Department and Labor & Industries.
- B. Affidavit of Wages Paid: Submit to Owner prior to Final Acceptance of the Work affidavits of wages paid by the Contractor and Subcontractors. Upon receipt of the affidavits of wages paid, the Owner may pay the contractor or subcontractor in full, including funds that would otherwise be retained according to the provisions of RCW 60.28.011.
 - 1. Within thirty days of receipt of the affidavit of wages paid, the Owner shall submit the affidavit of wages paid to the industrial statistician of the department of labor and industries for approval.
- C. The Owner will designate its representative to whom the Affidavit of Wages Paid shall be submitted.
- D. The Affidavit of Wages Paid shall be in a format approved by Department of Labor & Industry's Industrial Statistician.

PART 2 - PRODUCTS

- A. The form approved by the Washington State Department of Labor and Industries follows the Section.

END OF SECTION 00 73 43.19

SECTION 011100 - SUMMARY

PART 1 - GENERAL

1.1 TITLE OF DRAWINGS AND SPECIFICATIONS

NEW OFFICE AND FACILITIES BUILDING
NORTH BEACH WATER DISTRICT
2212 272ND ST.
OCEAN PARK, WA 98640

1.2 OWNER AND ARCHITECT DEFINED

A. Owner:

North Beach Water District
25902 Vernon Ave. #C
PO Box 618
Ocean Park, WA 98640
Contact: William "Bill" Neal

B. Architect:

David E. Jensen Architect, PS.
103 Pacific Avenue S.
PO Box 6
Long Beach, WA 98631
Telephone: (360) 642-3507
Contact: David E. Jensen

1.3 CONTRACTS

A. Contract Method: The work will be performed under a single lump-sum contract.

B. Work Not In Contract:

1. Terms and Definitions:

- a. Items indicated "NIC" will be furnished and installed by the Owner or under other contracts.
- b. Items indicated "OFCI" will be Owner furnished and Contractor installed.

1.4 SUMMARY OF WORK

- A. The work comprises the completed construction required by the Contract Documents and includes all labor necessary to provide such construction, and all materials and equipment incorporated in such construction.
- B. The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, agreements or representations either written or oral.
- C. The Owner may in some cases choose to award separate contracts to furnish materials/equipment, and/or labor necessary for installation. Such cases would be noted in the Contract Documents.

1.5 SCHEDULE OF DRAWINGS

- A. Architectural/Structural drawings indexed on Architectural Drawings Sheet 1 are the drawings referred to in these specifications and the same are hereby made a part of the General Contract.

END OF SECTION 011100

SECTION 012300 - ALTERNATES

PART 1 - GENERAL

1.1 GENERAL

- A. Each person bidding shall state in the spaces provided in the Bid Form, their proposal for performing the work of the Base Bid and alternates as described below.
- B. Base Bid - All work indicated on the drawings or indicated in the specification except the work called for under the Alternates.
- C. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the Base Bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.
 - 1. The cost or credit for each alternate is the net addition to or deduction from the Contract Sum to incorporate alternate into Work. No other adjustments are made to the Contract Sum.

1.2 PROCEDURES

- A. Coordination: Modify or adjust affected work as necessary to completely integrate work of the alternate into Project
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of the alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.
- C. Execute accepted alternates under the same conditions as other work of the Contract.
- D. Schedule: A schedule of Alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for material necessary to achieve the work described under each alternate

1.3 ALTERNATE SCHEDULE

- A. Alternate No. 1
 - 1. Provide Water Source Heat Pumps (2) as described in mechanical sections and drawings

2. Delete electric resistance wall heaters and thermostats where indicated on electrical sections and drawings

B. Alternate No. 2

1. Provide gravel paving along west, south, and east side of project site as described in appropriate sections and drawings

END OF SECTION 012300

SECTION 012400 - ADMINISTRATIVE PROCEDURE

PART 1 - ADMINISTRATIVE PROCEDURE

1.1 CONDITIONS OF CONTRACT

- A. Contractor shall familiarize himself thoroughly with the General Conditions and Supplemental Conditions, as well as technical sections.

1.2 PREBID CONFERENCE AND WALKTHROUGH

- A. A prebid conference is scheduled for June 8, 2015 in the meeting room of North Beach Water District located at 25902 Vernon Ave #C, Ocean Park, WA 98640. Bidders may view the site at that time or by appointment. One day notice is required. Contact Bill Neal (360)665-4144.

1.3 PROGRESS MEETINGS

- A. Intervals: Architect shall schedule and administer project meetings throughout progress of the Work at weekly intervals (or as noted).
- B. Attendance: Job superintendent, major subcontractors and suppliers; Owner and Architect as appropriate to agenda topics for each meeting.
- C. Suggested Agenda: Review of Work progress, status of progress schedule and adjustments thereto, delivery schedules, submittals, maintenance of quality standards, pending changes and substitutions, and other items affecting progress of work.

1.4 MATERIAL AND INFORMATION REQUIRED - The Contractor shall follow the procedures and furnish information to the Architect in the following manner:

A. GENERAL

1. Letters to Architect: Original and one copy.
2. All other letters: Single copy to Architect of letters particularly concerning Architect.
3. Prints and Specifications: General Contractor shall secure all copies of working drawings, specifications and addenda from the Architect.
4. Instructions to General Contractor: All instructions will be given by the Architect or his authorized agents. No other instructions shall be recognized. Instructions from Architect will be made to General Contractor or his authorized agent (job superintendent) for distribution to subcontractors or tradesmen on the job.
5. Transmitting Submittals: All submittals specified shall be transmitted to the Architect.

B. SUBMITTALS PRIOR TO START OF CONSTRUCTION

1. Certificates of Insurance: Prior to the commencement of any work, the Contractor shall file with the Owner, with a copy to the Architect, Certificates of Insurance. Insurance coverage shall be as stipulated in Part 2 of the General Conditions, and as modified by the Supplemental Conditions.
2. Payment Bond and Performance Bond: Prior to the commencement of any work, the Contractor shall file with the Owner, with a copy to the Architect, Payment and Performance Bonds for 100 percent (100%) of the Contract Sum. Bonds shall be as provided in Part 2 of the General Conditions.
3. Building Permit: Owner will obtain building permit. Owner will provide notification that a building permit has been obtained.

C. SUBMITTALS PRIOR TO APPLICATION FOR FIRST PAYMENT - Before applying for the first monthly partial payment, Contractor shall submit the following as called for in the General Conditions for review by Owner and Architect.

1. Schedule of Values: Show description of work with corresponding scheduled value.
2. Construction Progress Schedule: Provide a simple bar chart indicating areas of work (same as schedule of values) in a time frame.
3. Offshore Items Statement: In accordance with Section 5.14 of the General Conditions.
4. List of Subcontractors: Proposed for the principal parts of the work.
5. Intent to Pay Prevailing Wages: Approved copy must be on file by Owner for each classification of laborer, worker, or mechanic included in Application for Payment, employed by Contractor and subcontractors in accordance with provisions Section 007343.16

D. SUBMITTAL OF MONTHLY APPLICATIONS FOR PAYMENT

1. Form: Submit three (3) copies of each application.
2. Preliminary Application: The Contractor shall submit a single preliminary application to the Architect for prior approval. After approved by the Architect, the Contractor may make formal submittal of Application for Payment.
3. Construction Progress Schedule: Each monthly request for payment shall be accompanied by copies of Construction Progress Schedule in accordance with the General Conditions.
4. Certification of Payment to Subcontractors: Each monthly request for payments, including request for final payment, shall bear the Contractor's certification that all subcontractors and material suppliers have been paid in amounts equal to the percentage of completion stated in previous request for payment less retainage and allowed to the Contractor on account of work of subcontractors.
5. Submit "Intent to Pay Prevailing Wage" form for each contractor and subcontractor that has work included in the Application for Payment.

E. SUBMITTALS DURING CONSTRUCTION

1. Shop Drawings, Product Data and Samples

- a. General: Secure shop drawings, product data, and samples from subcontractors and transmit all required copies with letter of transmittal to the Architect. Letter of transmittal shall cite applicable drawing and specification references.
 - b. Shop Drawings: Shop drawings shall be submitted in the form of one legible reproducible to the Architect, transmitted through the Contractor for review and corrections. The Architect will return the reproducible to the Contractor with corrections, notations and Architect's action stamp. Shop drawings will not be reviewed by the Architect unless the Contractor has reviewed and approved them.
2. Certificates: Submit all Certificates of Compliance specified.

F. SUBMITTALS PRIOR TO FINAL COMPLETION

1. Written certification that Contractor has fully completed work in strict accordance with plans and specifications, and requesting final inspection.
2. Written certification that Contractor will replace all materials and workmanship that prove defective within one year after date of acceptance, except certain items called for in the technical sections, which shall be for more than one year (as stated).
3. Written guarantees as called for in the technical sections of these specifications. The duration of the guarantee shall be as specified in each of the sections. The general format of the guarantee (with words altered or inserted to suit the work) shall be as follows:

Address to the Owner: _____

(I), (We), (insert names of Subcontractor and General Contractor), certify that the

_____ work installed by the (Subcontractor) for your building has been performed in full accordance with plans and specifications.

Further, that we guarantee this work to be free from defects in workmanship or materials for a period of _____ years from date of final acceptance, and that we will make good any defects, without delay and without additional cost to the Owner.

Sincerely,
(Subcontractor)
Signed by (Authorized signature of the firm).

(General Contractor)
Signed by (Authorized signature of the firm).

4. Furnish "record" drawings and specifications of architectural and structural work.
5. Certification of Building Official and all other governing municipal departments or agencies that building has been approved and accepted. Furnish Certificate of Occupancy.
6. Affidavit from the Contractor stating that all subcontractors and material suppliers for the project have been paid in full.

7. Affidavit of Release of Liens from the Contractor stating that the attached lien releases or waivers include all parties who have lien rights.
8. Separate Releases or Waivers of Liens from subcontractors, and materials and equipment suppliers.
9. Final Waiver of Lien from the contractor stating that no claims are outstanding on the work covered by the contract.
10. Consent of Surety for Final Payment stating that final payment shall not relieve the Surety Company of any obligations to the Owner as set forth in the Performance and Labor and Materials Bonds.

G. SUBMITTALS PRIOR TO FINAL ACCEPTANCE

1. Affidavits of Wages Paid for the Contractor and all subcontractors certified by the State Department of Labor and Industries.
2. Certificate of Payment of State Excise Taxes by Public Works Contractor from the State Department of Revenue.
3. Certificate of Payments of Contributions on Public Works Contracts from the Employment Securities Department.

END OF SECTION 012400

SECTION 012900 - PAYMENT PROCEDURES

PART 1 - DESCRIPTION

1.1 GENERAL

- A. Comply with the procedures described in this Section when applying for progress payments and final payment under the Contract.

1.2 RELATED WORK

- A. Documents affecting work in this Section include, but are not limited to, the General Conditions and sections in Division 01 of these Specifications.
- B. The Contract sum and the schedule for payments are described in the Form of Agreement.
- C. Payments upon Substantial Completion and Completion of the Work are described in the General Conditions and in Section 017700 of these Specifications.

PART 2 - SUBMITTALS

2.1 PROCEDURES

- A. Make monthly submittal of request for payment on AIA Document G 702, "Application and Certificate for Payment" plus continuation sheet(s).
- B. Sign the Application and Certificate for Payment.
- C. Submit the Application and Certificate for Payment to the Architect for approval.
- D. The Architect will review submittal and upon approval will sign the Application and Certificate for Payment, will make required copies and distribute to Contractor and Owner.
- E. After the architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.
- F. The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of each Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of each Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in similar manner.

END OF SECTION 012900

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and –control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Requirements for Contractor to provide quality-assurance and –control services required by Architect, Owner or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities performed before and during construction to guard against defects and deficiencies and substantiate compliance with requirements.
- B. Quality-Control Services: Procedures and related actions to evaluate that actual products incorporated into completed construction comply with requirements.
- C. Mockups: Full-size, physical assemblies that are used to verify selection made under sample submittals, to demonstrate aesthetic effects and qualities of materials and execution. Approved mockups establish the standard of the Work.
- D. Quality Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct testing to establish product performance and compliance with industry standards.
- E. Experienced: When used with the entity, “experienced” means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements.

1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Architect for a decision before proceeding.

- B. Minimum Quantity or Quality Levels: The quantity or quality level shown shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. Refer uncertainties to Architect for a decision before proceeding.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
 - 1. Specification Section number and title.
 - 2. Description of test and inspection.
 - 3. Identification of applicable standards.
 - 4. Identification of test and inspection methods.
 - 5. Number of tests and inspections required.
 - 6. Time schedule or time span for tests and inspections.
 - 7. Entity responsible for performing tests and inspections.
 - 8. Requirements for obtaining samples.
 - 9. Unique characteristics of each quality-control service.
- C. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue, project information, and inspection dates.
 - 2. Testing Agency data.
- D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications
- C. Manufacturer Qualifications
- D. Fabricator Qualifications
- E. Professional Engineer Qualifications
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated.

- G. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation.

1.6 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged.
 2. Payment for these services will be made directly by Owner or authorized by Change Orders.
 3. Costs for retesting and re-inspecting construction will be charged to the Contractor.
- B. Unless noted otherwise, tests and inspections are Contractor's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agree to in writing by Owner.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.

END OF SECTION 014000

SECTION 017700 - CLOSE-OUT PROCEDURES AND SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL

- A. The Contractor shall provide an orderly and efficient transfer of the completed Work to the Owner.
- B. Prior to requesting inspection by the Architect, the Contractor shall use adequate means to assure that the Work is completed in accordance with the specified requirements and is ready for the requested inspection.
- C. Related work:
 - 1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 01 of these Specifications.

1.2 SUBSTANTIAL COMPLETION

- A. "Substantial Completion" is defined as the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use.
- B. Contractor shall prepare and submit to the Architect a list of items to be completed or corrected.
- C. Within a reasonable time after receipt of the list, the Architect will inspect to determine the status of completion.
- D. Should the Architect determine that the Work is not substantially complete:
 - 1. The Architect will promptly notify the Contractor, in writing, giving the reasons therefore.
 - 2. The Contractor shall remedy the deficiencies and notify the Architect when ready for reinspection.
 - 3. The Architect will reinspect the Work.
- E. When the Architect concurs that the Work is substantially complete:
 - 1. The Architect will prepare a "Certificate of Substantial Completion" on AIA form G 704, accompanied by the Contractor's list of items to be completed or corrected, as verified by the Architect.
 - 2. The Architect will submit the Certificate to the Owner and to the Contractor for their written acceptance of the responsibilities assigned to them in the Certificate.

1.3 FINAL COMPLETION

- A. The Contractor will prepare and submit a written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make the inspection.
- B. The Contractor certifies that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected for compliance with the Contract Documents.
 - 3. Work has been completed in accordance with the Contract Documents.
 - 4. Equipment and systems have been tested as required, and are operational.
 - 5. Work is complete and ready for final inspection.
- C. The Architect will make an inspection to verify status of completion.
- D. Should the Architect determine that the Work is incomplete or defective:
 - 1. The Architect will promptly notify the Contractor, in writing, listing the incomplete or defective work.
 - 2. The Contractor will remedy the deficiencies promptly, and notify the Architect when ready for reinspection.
- E. When the Architect determines that the Work is acceptable under the Contract Documents, he will request the Contractor to make closeout submittals.

PART 2 - SUBMITTALS

2.1 CLOSEOUT SUBMITTALS

- A. Project Record Documents described in Section 012400.
- B. Operation and maintenance data for items noted in these Specifications and other items when so directed by the Architect.
- C. Warranties and bonds.
- D. Keys and keying schedule.
- E. Evidence of Compliance with requirements of governmental agencies having jurisdiction.
 - 1. Certificates of Inspection.
 - 2. Certificates of Occupancy.
- F. Evidence of payment and release of liens.
 - 1. AIA Form G706, Contractor's Affidavit of Payment of Debit and Claims.
 - 2. AIA Form G706A, Contractor's Affidavit of Release of Liens.

- G. List of subcontractors, service organizations, principal vendors, including names, addresses and phone numbers.
- H. Evidence of compliance with Washington State Public Works Act (Prevailing Wage Law).

2.2 INSTRUCTION

- A. Instruct the Owner's personnel in proper operation of systems, equipment and similar items where provided as part of the Work.

PART 3 - CLEANING

3.1 GENERAL

- A. Throughout the construction period, maintain the building and site in a high standard of cleanliness.

3.2 PROGRESS CLEANING

- A. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
- B. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste materials from building and site.
- C. Provide adequate storage for all items awaiting removal from site, observing requirements for fire protection and protection of ecology.

3.3 FINAL CLEANING

- A. Prior to completion of work, remove from the job site all tools, surplus materials, equipment, scrap, debris and waste.
- B. Broom clean paved areas on the site and public paved areas adjacent to the site. Completely remove resultant debris.
- C. Visually inspect exterior and interior surfaces and remove all traces of soil, waste materials, smudges and other foreign matter.
- D. Remove all traces of splashed materials from adjacent surfaces.
- E. Remove paint droppings, spots, stains and dirt from all finished surfaces.
- F. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean project.

PART 4 - PROJECT RECORD DOCUMENTS

4.1 GENERAL

- A. Throughout the progress of the work, maintain an accurate record of changes in the Contract Document.
- B. Maintain accurate record of arrangements of items shown schematically in the Contract Documents.

4.2 RECORD DOCUMENTS

- A. One clean, new print copy of drawings using an erasable colored pencil, clearly describe the change or location of schematic items by graphic line and measurements and/or note as required.
- B. Date all entries.
- C. The Architect may waive the requirements for conversion of schematic layouts.

4.3 SUBMITTALS

- A. Submit two (2) completed sets of the Project Record Documents to the Architect for approval.
- B. As required, make changes and submit the final Project Record Documents to the Architect.

END OF SECTION 017700

SECTION 033000 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement.

1.3 INFORMATIONAL SUBMITTALS

- A. Material certificates.
- B. Material test reports.
- C. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
- D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.

1.6 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1.
 - 1. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
 - 1. ACI 301.
 - 2. ACI 117.

2.2 FORM-FACING MATERIALS

- A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

2.3 STEEL REINFORCEMENT

- A. Galvanized Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed bars, ASTM A 767/A 767M, Class I zinc coated after fabrication and bending.
- B. Deformed-Steel Welded-Wire Reinforcement: ASTM A 1064/A 1064M, flat sheet.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

2.4 CONCRETE MATERIALS

- A. Cementitious Materials:
 - 1. Portland Cement: ASTM C 150/C 150M, Type V, gray.
- B. Normal-Weight Aggregates: ASTM C 33/C 33M, graded.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

- C. Air-Entraining Admixture: ASTM C 260/C 260M.
- D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
- E. Water: ASTM C 94/C 94M and potable.

2.5 FIBER REINFORCEMENT

- A. Synthetic Micro-Fiber: Fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Euclid Chemical Company (The), an RPM company; PSI Fiberstrand F.
 - b. FORTA Corporation; FORTA Ultra-Net.
 - c. Grace Construction Products, W. R. Grace & Co.; Grace Fibers.
 - d. Nycon, Inc.; ProCon-F.
 - e. Propex; Fibermesh 300.
 - f. Sika Corporation, Inc.; Sika Fiber PPF.

2.6 WATERSTOPS

- A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BoMetals, Inc.
 - b. Paul Murphy Plastics Company.
 - c. Sika Greenstreak.
 - d. Vinylex Waterstop & Accessories.

2.7 VAPOR RETARDERS

- A. Sheet Vapor Retarder: ASTM E 1745, Class B. Include manufacturer's recommended adhesive or pressure-sensitive tape.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fortifiber Building Systems Group; Moistop Ultra 6.
 - b. Reef Industries, Inc.; Griffolyn Type-85 10 mil Green Vaporguard.

2.8 CURING MATERIALS

- A. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- B. Water: Potable.
- C. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals, LLC; Kure-N-Seal 25 LV.
 - b. ChemMasters; Spray-Cure & Seal 25.
 - c. Dayton Superior Corporation; Cure & Seal 1315 J22UV.
 - d. Euclid Chemical Company (The), an RPM company; Super Diamond Clear.
 - e. Kaufman Products, Inc.; Krystal 25.
 - f. L&M Construction Chemicals, Inc.; Lumiseal Plus.
 - g. Lambert Corporation; UV Super Seal.
 - h. Meadows, W. R., Inc.; CS-309-30.
 - i. Metalcrete Industries; Seal N Kure 30.
 - j. Nox-Crete Products Group; Cure & Seal 1315 A.
 - k. Right Pointe; Right Sheen 30.
 - l. SpecChem, LLC; Cure & Seal 25.
 - m. TK Products; Kure & Seal 1315.
 - n. Vexcon Chemicals, Inc.; Certi-Vex AC1315.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

2.10 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
- B. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use admixture in concrete, as required, for placement and workability.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Normal-Weight Concrete:
 - 1. Minimum Compressive Strength: 3000 psi at 28 days.
 - 2. Maximum W/C Ratio: 0.45.
 - 3. Slump Limit: 5 inches, plus or minus 1 inch.

4. Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.
5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
6. Synthetic Micro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than a rate of 1.5 lb/cu. yd..

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.
 1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Chamfer exterior corners and edges of permanently exposed concrete.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.3 VAPOR-RETARDER INSTALLATION

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 1. Lap joints 6 inches and seal with manufacturer's recommended tape.

3.4 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

3.5 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
 - 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

3.6 WATERSTOP INSTALLATION

- A. Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed.
- B. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
 - 1. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces not exposed to public view.
- B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes to produce a profile amplitude of 1/4 inch in one direction.
 - 1. Apply scratch finish to surfaces indicated.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power-driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces indicated.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.

C. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
2. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.

3.12 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

END OF SECTION 033000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Wood blocking, cants, and nailers.
3. Wood furring and grounds.
4. Plywood backing panels.
5. Plywood wainscoting.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
1. Wood-preservative-treated wood.
 2. Power-driven fasteners.
 3. Post-installed anchors.
 4. Metal framing anchors.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.

3. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches above the ground in crawlspaces or unexcavated areas.

2.3 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: All interior partitions.

2. Species:

- a. Western woods; WCLIB or WWPA.

B. Framing Other Than Non-Load-Bearing Partitions: Construction or No. 2 grade.

1. Application: Framing other than interior partitions.

2. Species:

- a. Douglas fir-larch; WCLIB or WWPA.
- b. Hem-fir; WCLIB or WWPA.

2.4 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
 - 3. Rooftop equipment bases and support curbs.
 - 4. Cants.
 - 5. Furring.
- B. Dimension Lumber Items: Standard, Stud, or No. 3 grade lumber of any species.
- C. Concealed Boards: 19 percent maximum moisture content and the following species and grades:
 - 1. Western woods; Standard or No. 3 Common grade; WCLIB or WWPA.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS1, Exterior, A-C, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.6 PLYWOOD WAINSCOTING

- A. 1/2" CDX Plywood.
 - 1. Finish: Primed.

2.7 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- C. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC193 or ICC-ES AC308 as appropriate for the substrate.

2.8 METAL FRAMING ANCHORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. KC Metals Products, Inc.
 2. USP Structural Connectors.
- B. Allowable design loads, as published by manufacturer, shall meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.
1. Use for interior locations unless otherwise indicated.
- D. Stainless Steel: ASTM A 666, Type 304 or 316.
1. Use for interior locations unless otherwise indicated.
- 2.9 MISCELLANEOUS MATERIALS
- A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber or rubberized-asphalt compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch.
- C. Adhesives for Gluing Furring to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- C. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- D. Install shear wall panels to comply with manufacturer's written instructions.
- E. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

- F. Do not splice structural members between supports unless otherwise indicated.
- G. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.

3.2 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Roof sheathing.
3. Subflooring.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For the following, from ICC-ES:

1. Wood-preserved-treated plywood.

PART 2 - PRODUCTS

2.1 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings and plywood in contact with masonry or concrete or used with roofing, flashing, vapor barriers, and waterproofing.

2.2 WALL SHEATHING

- A. Plywood Sheathing: Either DOC PS 1 or DOC PS 2, sheathing.

1. Thickness: 1/2 inch.

2.3 ROOF SHEATHING

- A. Plywood Sheathing: Either DOC PS1 or DOC PS2, Exterior, Structural II sheathing.

1. Thickness: 1/2 inch.

2.4 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Subflooring: Either DOC PS 1 or DOC PS 2, Exposure 1 single-floor panels or sheathing.

1. Thickness: 3/4 inch.

2.5 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

1. For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.

2.6 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
1. Table 2304.9.1, "Fastening Schedule," in the ICC's International Building Code.
2. ICC-ES evaluation report for fastener.
- D. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Combination Subfloor-Underlayment:
 - a. Glue and nail to wood framing.
 - b. Space panels 1/8 inch apart at edges and ends.
 - 2. Subflooring:
 - a. Glue and nail to wood framing.
 - b. Space panels 1/8 inch apart at edges and ends.
 - 3. Wall and Roof Sheathing:
 - a. Nail to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
 - b. Space panels 1/8 inch apart at edges and ends.
 - 4. Underlayment:
 - a. Nail to subflooring.
 - b. Space panels 1/32 inch apart at edges and ends.
 - c. Fill and sand edge joints of underlayment receiving resilient flooring immediately before installing flooring.

END OF SECTION 061600

SECTION 061753 - SHOP-FABRICATED WOOD TRUSSES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood roof trusses.

1.2 ACTION SUBMITTALS

A. Product Data: For metal-plate connectors, metal truss accessories, and fasteners.

B. Shop Drawings: Show fabrication and installation details for trusses.

1. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
2. Indicate sizes, stress grades, and species of lumber.
3. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
4. Indicate locations, sizes, and materials for permanent bracing required to prevent buckling of individual truss members due to design loads.
5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
6. Show splice details and bearing details.

C. Delegated-Design Submittal: For metal-plate-connected wood trusses indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.3 INFORMATIONAL SUBMITTALS

A. Product Certificates: For metal-plate-connected wood trusses, signed by officer of truss-fabricating firm.

B. Evaluation Reports: For the following, from ICC-ES:

1. Metal-plate connectors.
2. Metal truss accessories.

1.4 QUALITY ASSURANCE

A. Metal Connector-Plate Manufacturer Qualifications: A manufacturer that is a member of TPI and that complies with quality-control procedures in TPI 1 for manufacture of connector plates.

1. Manufacturer's responsibilities include providing professional engineering services needed to assume engineering responsibility.
 2. Engineering Responsibility: Preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.
- B. Fabricator Qualifications: Shop that participates in a recognized quality-assurance program, complies with quality-control procedures in TPI 1, and involves third-party inspection by an independent testing and inspecting agency acceptable to Architect and authorities having jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Handle and store trusses to comply with recommendations in SBCA BCSI, "Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining, & Bracing Metal Plate Connected Wood Trusses."

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design metal-plate-connected wood trusses.
- B. Structural Performance: Metal-plate-connected wood trusses shall be capable of withstanding design loads within limits and under conditions indicated. Comply with requirements in TPI 1.
- C. Comply with applicable requirements and recommendations of TPI 1, TPI DSB, and SBCA BCSI.
- D. Wood Structural Design Standard: Comply with applicable requirements in AF&PA's "National Design Specifications for Wood Construction" and its "Supplement."

2.2 DIMENSION LUMBER

- A. Lumber: DOC PS 20 and applicable rules of any rules-writing agency certified by the American Lumber Standard Committee (ALSC) Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
1. Provide dry lumber with 19 percent maximum moisture content at time of dressing.
- B. Permanent Bracing: Provide wood bracing that complies with requirements for miscellaneous lumber in Section 061000 "Rough Carpentry."

2.3 METAL CONNECTOR PLATES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Alpine Engineered Products, Inc.; a division of ITW Building Components Group, Inc.
 - 2. Cherokee Metal Products, Inc.; Masengill Machinery Company.
 - 3. CompuTrus, Inc.
 - 4. Eagle Metal Products.
 - 5. Jager Building Systems, Inc.
 - 6. MiTek Industries, Inc.
 - 7. Robbins Engineering, Inc.
 - 8. Truswal Systems Corporation.
- B. General: Fabricate connector plates to comply with TPI 1.
- C. Hot-Dip Galvanized-Steel Sheet: ASTM A 653/A 653M; Structural Steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G60 coating designation; and not less than 0.036 inch thick.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Provide fasteners for use with metal framing anchors that comply with written recommendations of metal framing manufacturer.
 - 2. Where trusses are exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.

2.5 METAL FRAMING ANCHORS AND ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Cleveland Steel Specialty Co.
 - 2. KC Metals Products, Inc.
 - 3. Phoenix Metal Products, Inc.
 - 4. Simpson Strong-Tie Co., Inc.
 - 5. USP Structural Connectors.

- B. Allowable design loads, as published by manufacturer, shall comply with or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency. Framing anchors shall be punched for fasteners adequate to withstand same loads as framing anchors.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 coating designation.

2.6 FABRICATION

- A. Assemble truss members in design configuration indicated; use jigs or other means to ensure uniformity and accuracy of assembly, with joints closely fitted to comply with tolerances in TPI 1. Position members to produce design camber indicated.
 - 1. Fabricate wood trusses within manufacturing tolerances in TPI 1.
- B. Connect truss members by metal connector plates located and securely embedded simultaneously in both sides of wood members by air or hydraulic press.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. If trusses are delivered to Project site in more than one piece, assemble trusses before installing.
- C. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
- D. Install and brace trusses according to TPI recommendations and as indicated.
- E. Anchor trusses securely at bearing points; use metal truss tie-downs or floor truss hangers as applicable. Install fasteners through each fastener hole in metal framing anchors according to manufacturer's fastening schedules and written instructions.
- F. Securely connect each truss ply required for forming built-up girder trusses.
- G. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
 - 1. Install bracing to comply with Section 061000 "Rough Carpentry."
- H. Install wood trusses within installation tolerances in TPI 1.
- I. Do not alter trusses in field. Do not cut, drill, notch, or remove truss members.

- J. Replace wood trusses that are damaged or do not comply with requirements.

END OF SECTION 061753

SECTION 062013 - EXTERIOR FINISH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Plywood soffits.

1.2 DEFINITIONS

- A. MDO: Plywood with a medium-density overlay on the face.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.
- B. Samples: For each type of product involving selection of colors, profiles, or textures.

1.4 INFORMATIONAL SUBMITTALS

- A. Compliance Certificates:
1. For lumber that is not marked with grade stamp.
 2. For preservative-treated wood that is not marked with treatment-quality mark.

PART 2 - PRODUCTS

2.1 PLYWOOD SOFFITS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Georgia-Pacific Building Products.
 2. Hardel Mutual Plywood Corporation.
 3. Hood Industries.
 4. K Ply Inc.
 5. Pacific Wood Laminates, Inc.
 6. Plum Creek Timber Company, Inc.
 7. Roseburg Forest Products.
 8. Roy O. Martin Lumber Management, L.L.C.
 9. SDS Lumber Company.

10. Stimson Lumber Company, Inc.
11. Swanson Group.
12. Textured Forest Products, Inc.

- B. Plywood Type: Exterior, Grade C-C, plugged and touch sanded.
- C. Thickness: As indicated.
- D. Pattern: Plain.
- E. Surface: Smooth.

2.2 MISCELLANEOUS MATERIALS

- A. Continuous Soffit Vents: PVC continuous soffit vent.
 1. Net-Free Area: 9 sq. in/linear ft..
 2. Finish: White.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prime lumber and moldings to be painted, including both faces and edges, unless factory primed. Cut to required lengths and prime ends. Comply with requirements in Section 099113 "Exterior Painting."

3.2 INSTALLATION, GENERAL

- A. Install exterior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.
 1. Scribe and cut exterior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.

END OF SECTION 062013

SECTION 064600 - WOOD TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior standing and running trim.
2. Interior standing and running trim.
3. Closet and utility shelving.
4. Wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.
5. Shop priming of wood trim.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples:

1. Lumber and panel products with shop-applied opaque finish, for each finish system and color, with exposed surface finished.

1.3 INFORMATIONAL SUBMITTALS

A. Woodwork Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Licensee of WI's Certified Compliance Program.

1.5 FIELD CONDITIONS

- A. Weather Limitations for Exterior Work: Proceed with installation of exterior wood trim only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.
- B. Environmental Limitations for Interior Work: Do not deliver or install interior wood trim until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 WOOD TRIM, GENERAL

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels and certificates from WI certification program indicating that woodwork complies with requirements of grades specified.

2.2 EXTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Grade: Clear Finger-jointed.
- B. Wood Species: Cedar or Cyprus.

2.3 INTERIOR STANDING AND RUNNING TRIM FOR OPAQUE FINISH

- A. Grade: Mixed Grade.
- B. Wood Species: Clear Hemlock.

2.4 CLOSET AND UTILITY SHELVING

- A. Grade: Mixed Grade.
- B. Shelf Material: 1 X 12 Hemlock.
- C. Cleats: 1x6 of same shelf material.
- D. Wood Species: Hemlock - Mixed Grade.
- E. Closet Rods: 1-1/2-inch-diameter, hardwood.

2.5 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.
 - 1. Wood Moisture Content for Exterior Materials: 9 to 15 percent.
 - 2. Wood Moisture Content for Interior Materials: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of wood trim and quality grade specified unless otherwise indicated.

1. Medium-Density Fiberboard: ANSI A208.2, Grade 130.
2. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for test methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.6 MISCELLANEOUS MATERIALS

- A. Exterior Blocking, Shims, and Nailers: Softwood or hardwood lumber, pressure-preservative treated, kiln dried to less than 15 percent moisture content.
 1. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC3b.
 - a. Kiln dry lumber after treatment to a maximum moisture content of 19 percent.
 - b. Mark lumber with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee's (ALSC) Board of Review.
- B. Interior Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content.
- C. Nails for Exterior Use: Type 316 stainless steel.
- D. Screws for Exterior Use: Type 316 stainless steel.
- E. Provide self-drilling screws for metal-framing supports.
- F. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- G. Handrail Brackets: Cast from malleable iron with wall flange drilled and tapped for concealed hanger bolt and with support arm for screwing to underside of rail. Sized to provide 1-1/2-inch clearance between handrail and wall.

2.7 FABRICATION

- A. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 1. Edges of Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
 2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
- B. Backout or groove backs of flat trim members and kerf backs of other wide, flat members except for members with ends exposed in finished work.
- C. Assemble casings in shop except where shipping limitations require field assembly.

2.8 SHOP PRIMING

- A. Exterior Wood Trim for Opaque Finish: Shop prime with one coat of wood primer specified in Section 099113 "Exterior Painting."
- B. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition wood trim to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

- A. Grade: Install wood trim to comply with same grade as item to be installed.
- B. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/16 inch in 96 inches.
- C. Scribe and cut wood trim to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- D. Preservative-Treated Wood: Where cut or drilled in field, treat cut ends and drilled holes according to AWPA M4.
- E. Anchor wood trim to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use fine finishing nails for exposed fastening, countersunk and filled flush with woodwork.
 - 1. For shop-finished items, use filler matching finish of items being installed.
- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 60 inches long except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
 - 1. Install wall railings on indicated metal brackets securely fastened to wall framing.
 - 2. Install standing and running trim with no more variation from a straight line than 1/16 inch in 96 inches.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 064600

SECTION 066400 - PLASTIC PANELING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes plastic sheet paneling.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For plastic paneling and trim accessories.

1.3 QUALITY ASSURANCE

- A. Testing Agency: Acceptable to authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 PLASTIC SHEET PANELING

- A. Glass-Fiber-Reinforced Plastic Paneling: Gelcoat-finished, glass-fiber-reinforced plastic panels complying with ASTM D 5319.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Crane Composites, Inc.
 - b. Glasteel.
 - c. Marlite.
 - d. Newcourt, Inc.
 - e. Nudo Products, Inc.
 - f. Parkland Plastics, Inc.
 - 2. Surface-Burning Characteristics: As follows when tested by a qualified testing agency according to ASTM E 84. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 3. Nominal Thickness: Not less than 0.09 inch.
 - 4. Surface Finish: As selected by Architect from manufacturer's full range.

5. Color: As selected by Architect from manufacturer's full range.

2.2 ACCESSORIES

- A. Trim Accessories: Manufacturer's standard one-piece vinyl extrusions designed to retain and cover edges of panels. Provide division bars, inside corners, outside corners, and caps as needed to conceal edges.
 1. Color: Match panels.
- B. Sealant: Mildew-resistant, single-component, neutral-curing or acid-curing silicone sealant recommended by plastic paneling manufacturer and complying with requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that could impair adhesive bond, including oil, grease, dirt, and dust.
- B. Condition panels by unpacking and placing in installation space before installation according to manufacturer's written recommendations.
- C. Lay out paneling before installing. Locate panel joints where indicated.

3.2 INSTALLATION

- A. Install plastic paneling according to manufacturer's written instructions.
- B. Install panels in a full spread of adhesive.
- C. Install trim accessories with adhesive and nails. Do not fasten through panels.
- D. Fill grooves in trim accessories with sealant before installing panels, and bed inside corner trim in a bead of sealant.
- E. Maintain uniform space between panels and wall fixtures. Fill space with sealant.
- F. Remove excess sealant and smears as paneling is installed. Clean with solvent recommended by sealant manufacturer and then wipe with clean dry cloths until no residue remains.

END OF SECTION 066400

SECTION 071326 - SELF-ADHERING SHEET WATERPROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modified bituminous sheet waterproofing.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

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

1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period.

1. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: Minimum 60-mil nominal thickness, self-adhering sheet consisting of 56 mils of rubberized asphalt laminated on one side to a 4-mil-thick, polyethylene-film reinforcement, and with release liner on adhesive side.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. American Hydrotech, Inc.; VM60.
 - b. Carlisle Coatings & Waterproofing Inc; CCW MiraDRI 860/861.
 - c. CETCO Building Materials Group, a subsidiary of AMCOL International Corp; Envirosheet.
 - d. Grace Construction Products; W.R. Grace & Co. -- Conn.; Bituthene 3000.
 - e. Protecto Wrap Company; PW-100/60.
 - f. Soprema, Inc.; Colphene 3000.
 - g. W.R. Meadows, Inc; SealTight Mel-Rol.
 2. Physical Properties:
 - a. Tensile Strength, Membrane: 250 psi minimum; ASTM D 412, Die C, modified.
 - b. Ultimate Elongation: 300 percent minimum; ASTM D 412, Die C, modified.
 - c. Low-Temperature Flexibility: Pass at minus 20 deg F; ASTM D 1970/D 1970M.
 - d. Crack Cycling: Unaffected after 100 cycles of 1/8-inch movement; ASTM C 836/C 836M.
 - e. Puncture Resistance: 40 lbf minimum; ASTM E 154/E 154M.
 - f. Water Absorption: 0.2 percent weight-gain maximum after 48-hour immersion at 70 deg F; ASTM D 570.
 - g. Water Vapor Permeance: 0.05 perm maximum; ASTM E 96/E 96M, Water Method.
 - h. Hydrostatic-Head Resistance: 200 feet minimum; ASTM D 5385.
 3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.

2.2 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Primer: Liquid waterborne primer recommended for substrate by sheet-waterproofing material manufacturer.

- C. Surface Conditioner: Liquid, waterborne surface conditioner recommended for substrate by sheet-waterproofing material manufacturer.
- D. Liquid Membrane: Elastomeric, two-component liquid, cold fluid applied, of trowel grade or low viscosity.
- E. Substrate Patching Membrane: Low-viscosity, two-component, modified asphalt coating.
- F. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch , predrilled at 9-inch centers.
- G. Protection Course: ASTM D 6506, semirigid sheets of fiberglass or mineral-reinforced-asphaltic core, pressure laminated between two asphalt-saturated fibrous liners and as follows:
 - 1. Thickness: Nominal 1/8 inch for vertical applications; 1/4 inch elsewhere.
 - 2. Adhesive: Rubber-based solvent type recommended by waterproofing manufacturer for protection course type.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.

3.2 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and per recommendations in ASTM D 6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. 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 watertight installation.
 - 1. When ambient and substrate temperatures range between 25 and 40 deg F, install self-adhering, modified bituminous sheets produced for low-temperature application. Do not use low-temperature sheets if ambient or substrate temperature is higher than 60 deg F.
- D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water.

- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet-waterproofing terminations with mastic.
- G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches beyond repaired areas in all directions.
- I. Immediately install protection course with butted joints over waterproofing membrane.

3.3 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane.
- B. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 071326

SECTION 071800 - TRAFFIC COATINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes pavement markings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product, including installation instructions.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace traffic coating that fails in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Material Compatibility: Provide primers; base-, intermediate-, and topcoat; and accessory materials that are compatible with one another and with substrate under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

2.2 ACCESSORY MATERIALS

- A. Joint Sealants: As specified in Section 079200 "Joint Sealants."

2.3 PAVEMENT MARKINGS

- A. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, Type II, with drying time of less than 45 minutes.
 - 1. Color: As indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Clean and prepare substrates according to ASTM C 1127 and manufacturer's written instructions to produce clean, dust-free, dry substrate for traffic-coating application.
 - 1. Application of coating indicates acceptance of surfaces and conditions.
- B. Mask adjoining surfaces not receiving traffic coatings to prevent overspray, spillage, leaking, and migration of coatings. Prevent traffic-coating materials from entering deck substrate penetrations and clogging weep holes and drains.

3.2 PAVEMENT MARKINGS

- A. Do not apply pavement-marking paint for striping and other markings until layout, colors, and placement have been verified with Architect and traffic coating has cured.
- B. Sweep and clean surface to eliminate loose material and dust.
- C. Apply pavement-marking paint with mechanical equipment to produce markings of dimensions indicated with uniform straight edges. Apply at manufacturer's recommended rates for a 15-mil-minimum, wet film thickness.

3.3 PROTECTING AND CLEANING

- A. Protect traffic coatings from damage and wear during remainder of construction period.
- B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 071800

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass-fiber blanket.

1.2 ACTION SUBMITTALS

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

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Research reports.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET

- A. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:

1. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.

- B. Glass-Fiber Blanket, Polypropylene-Scrim-Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class A (faced surface with a flame-spread index of 25 or less); Category 1 (membrane is a vapor barrier).

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Johns Manville; a Berkshire Hathaway company.
 - c. Owens Corning.

2.2 ACCESSORIES

- A. Insulation for Miscellaneous Voids:

1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
 2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.
- C. Adhesive for Bonding Insulation: Product compatible with insulation and air and water barrier materials, and with demonstrated capability to bond insulation securely to substrates without damaging insulation and substrates.
- D. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide ventilation between insulated attic spaces and vented eaves.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- 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. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.2 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
1. Use insulation widths and lengths that fill the 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. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 5. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:

- a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- 6. Vapor-Retarder-Faced Blankets: Tape joints and ruptures in vapor-retarder facings, and seal each continuous area of insulation to ensure airtight installation.
 - a. Exterior Walls: Set units with facing placed toward as indicated on Drawings.
 - b. Interior Walls: Set units with facing placed as indicated on Drawings.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft.
 - 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100

SECTION 072500 - WEATHER BARRIERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Building paper.
2. Flexible flashing.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Evaluation Reports: For flexible flashing, from ICC-ES.

PART 2 - PRODUCTS

2.1 WATER-RESISTIVE BARRIER

- A. Building Paper: ASTM D 226, Type 1 (No. 15 asphalt-saturated organic felt), unperforated.
- B. Building Paper: Water-vapor-permeable, asphalt-saturated kraft building paper that complies with ICC-ES AC38, Grade D; except with water-resistance rating not less than 1 hour.

2.2 FLEXIBLE FLASHING

- A. Butyl Rubber Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 14 mil0.040 inch.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. DuPont Building Innovations: E. I. du Pont de Nemours and Company; DuPont Flashing Tape.
 - b. Grace Construction Products; W.R. Grace & Co. -- Conn.; Vycor Butyl Self Adhered Flashing.
 - c. Protecto Wrap Company; BT-25 XL.
 - d. Raven Industries, Inc; Fortress Flashshield.

2. Flame Propagation Test: Materials and construction shall be as tested according to NFPA 285.

PART 3 - EXECUTION

3.1 WATER-RESISTIVE BARRIER INSTALLATION

- A. Cover sheathing with water-resistive barrier as follows:
 1. Cut back barrier 1/2 inch on each side of the break in supporting members at expansion- or control-joint locations.
 2. Apply barrier to cover vertical flashing with a minimum 4-inch overlap unless otherwise indicated.
- B. Building Paper: Apply horizontally with a 4-inch overlap and a 6-inch end lap; fasten to sheathing with galvanized staples or roofing nails.

3.2 FLEXIBLE FLASHING INSTALLATION

- A. Apply flexible flashing where indicated to comply with manufacturer's written instructions.
 1. Lap seams and junctures with other materials at least 4 inches except that at flashing flanges of other construction, laps need not exceed flange width.
 2. Lap flashing over water-resistive barrier at bottom and sides of openings.
 3. Lap water-resistive barrier over flashing at heads of openings.

END OF SECTION 072500

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Underlayment.
 - 3. Ridge vents.
 - 4. Metal flashing and trim.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Evaluation reports.
- C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
 - 1. Material Warranty Period: 15 years from date of Substantial Completion.

2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 110 mph for five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462/D 3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Malarkey Roofing Products Co.
 - b. Owens Corning.
 2. Butt Edge: Straight cut.
 3. Strip Size: Manufacturer's standard.
 4. Algae Resistance: Granules resist algae discoloration.
 5. Impact Resistance: UL 2218, Class 4.
 6. Color and Blends: As selected by Architect from manufacturer's full range.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.2 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, asphalt-saturated organic felts, nonperforated.
 1. Type: Type I.
- B. Self-Adhering Sheet Underlayment, High Temperature: Minimum of 40-mil- thick; with slip-resisting, polymer-film-reinforced or glass-reinforced top surface laminated to layer of butyl or SBS-modified asphalt adhesive; with release backing; cold applied; and evaluated and documented to be suitable for use for intended purpose under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Grace, W. R. & Co. - Conn.
 - b. Owens Corning.
 2. Thermal Stability: Stable after testing at 240 deg F according to ASTM D 1970/D 1970M.
 3. Low-Temperature Flexibility: Passes after testing at minus 20 deg F according to ASTM D 1970/D 1970M.

2.3 RIDGE VENTS

- A. Rigid Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under ridge shingles.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Air Vent, Inc.; a Gibraltar Industries company.
 - b. Cor-A-Vent, Inc.
 - c. GAF Materials Corporation.
 - d. Lomanco, Inc.
 - e. Obdyke, Benjamin Incorporated.
 - f. Owens Corning.
 - g. The Tapco Group; Mid-America Siding Components.
 - 2. Features:
 - a. Nonwoven geotextile filter strips.
 - b. External deflector baffles.

2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- diameter, sharp-pointed, with a minimum 3/8-inch-diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking or extend at least 1/8 inch through OSB or plywood sheathing.
 - 1. Shank: Barbed.
 - 2. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Felt-Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch minimum diameter.

2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Single-Layer Felt Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches over underlying course. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches. Fasten with felt-underlayment nails.
 - 1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt over self-adhering sheet underlayment not less than 3 inches in direction that sheds water. Lap ends of felt not less than 6 inches over self-adhering sheet underlayment.
 - 2. Install fasteners at no more than 36 inches o.c.
- C. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install lapped in direction that sheds water. Lap sides not less than 3-1/2 inches. Lap ends not less than 6 inches staggered 24 inches between courses. Roll laps with roller. Cover underlayment within seven days.

3.2 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

3.3 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip with tabs removed with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 1/2 inch over fasciae at eaves and rakes.
 - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

- D. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- E. Fasten asphalt-shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
 - 1. Where roof slope exceeds 21:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
 - 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 - 3. When ambient temperature during installation is below 50 deg F, seal asphalt shingles with asphalt roofing cement spots.
- F. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.
 - 1. Set valley edge of asphalt shingles in a 3-inch- wide bed of asphalt roofing cement.
 - 2. Do not nail asphalt shingles to metal open-valley flashings.
- G. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
- H. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.
 - 1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 073113

SECTION 074646 - FIBER-CEMENT SIDING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes fiber-cement siding.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For fiber-cement siding including related accessories.

1.3 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Product test reports.
- C. Research/evaluation reports.
- D. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 FIBER-CEMENT SIDING

- A. General: ASTM C 1186, Type A, Grade II, fiber-cement board, noncombustible when tested according to ASTM E 136; with a flame-spread index of 25 or less when tested according to ASTM E 84.

1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. CertainTeed Corporation.
 - b. James Hardie Building Products, Inc.
 - B. Labeling: Provide fiber-cement siding that is tested and labeled according to ASTM C 1186 by a qualified testing agency acceptable to authorities having jurisdiction.
 - C. Nominal Thickness: Not less than 5/16 inch.
 - D. Horizontal Pattern: Boards 6-1/4 to 6-1/2 inches wide in plain style.
 1. Texture: Smooth.
 - E. Factory Priming: Manufacturer's standard acrylic primer.
- 2.2 ACCESSORIES
- A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.
 - B. Flashing: Provide stainless-steel flashing complying with Section 076200 "Sheet Metal Flashing and Trim" at window and door heads and where indicated.
 - C. Fasteners:
 1. For fastening to wood, use siding nails of sufficient length to penetrate a minimum of 1 inch into substrate.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
 1. Install fasteners no more than 24 inches o.c.
- B. Install joint sealants as specified in Section 079200 "Joint Sealants" and to produce a weathertight installation.

3.2 ADJUSTING AND CLEANING

- A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

- B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074646

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed roof-drainage sheet metal fabrications.
2. Formed wall sheet metal fabrications.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop- and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, roof-penetration flashing, and connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified.

1.3 INFORMATIONAL SUBMITTALS

A. Product certificates.

B. Product test reports.

C. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.5 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 successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

1.6 WARRANTY

- A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Finish Warranty Period: 10 years from date of Substantial Completion.

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. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.
- D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
 1. Design Pressure: As indicated on Drawings.
- E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 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. Aluminum Sheet: ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required.
 1. As-Milled Finish: Mill.

2.3 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.
- B. Self-Adhering, High-Temperature Sheet: Minimum 30 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carlisle Coatings & Waterproofing Inc; CCW WIP 300HT.
 - b. Grace Construction Products; W.R. Grace & Co. -- Conn.; Grace Ice and Water Shield HT.
 - 2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
 - 3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.

2.4 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.
 - 2. Fasteners for Aluminum Sheet: Aluminum or Series 300 stainless steel.
 - 3. Fasteners for Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. 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.

- D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- E. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- F. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

2.5 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. Obtain field measurements for accurate fit before shop fabrication.
 - 2. 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.
 - 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. 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.
- C. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.
- H. Seams for Aluminum: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints where necessary for strength.

2.6 ROOF-DRAINAGE SHEET METAL FABRICATIONS

- A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in continuous long sections. Furnish flat-stock gutter brackets and gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
- B. Downspouts: Fabricate rectangular downspouts to dimensions indicated, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors.
 - 1. Hanger Style: Concealed.
 - 2. Fabricate from the following materials:
 - a. Aluminum: 0.024 inch thick.
- C. Splash Pans: Fabricate to dimensions and shape required and from the following materials:
 - 1. Aluminum: 0.040 inch thick.

2.7 WALL SHEET METAL FABRICATIONS

- A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch-long, but not exceeding 12-foot-long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch-high, end dams. Fabricate from the following materials:
 - 1. Stainless Steel: 0.016 inch thick.
- B. Opening Flashings in Frame Construction: Fabricate head and similar flashings to extend beyond wall openings. Fabricate from the following materials:
 - 1. Aluminum-Zinc Alloy-Coated Steel: 0.022 inch thick.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION

- A. Felt Underlayment: Install felt underlayment, wrinkle free, using adhesive to minimize use of mechanical fasteners under sheet metal flashing and trim. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

- B. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

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 true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure sealant.
 - 2. 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.
 - 3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 - 4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
 - 5. Torch cutting of sheet metal flashing and trim is not permitted.
- 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 uncoated-aluminum sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 - 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- 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 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. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."
- G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.3 ROOF-DRAINAGE SYSTEM INSTALLATION

- A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.
- B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.
 - 1. Install continuous gutter with no joints on concealed hangers.
- C. Downspouts: Provide hangers with fasteners designed to hold downspouts securely to walls. Locate hangers at top and bottom and at midpoint.

3.4 ROOF FLASHING INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.
- B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate.
- C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches.

3.5 WALL FLASHING INSTALLATION

- A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.6 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.

END OF SECTION 076200

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Nonstaining silicone joint sealants.
3. Urethane joint sealants.
4. Immersible joint sealants.
5. Mildew-resistant joint sealants.
6. Latex joint sealants.

1.2 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product.
- B. Samples: For each kind and color of joint sealant required.
- C. Joint-Sealant Schedule: Include the following information:
1. Joint-sealant application, joint location, and designation.
 2. Joint-sealant manufacturer and product name.
 3. Joint-sealant formulation.
 4. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Preconstruction field-adhesion-test reports.
- C. Sample warranties.

1.4 QUALITY ASSURANCE

- A. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

1.5 PRECONSTRUCTION TESTING

- A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates. Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1.1 in ASTM C 1193 or Method A, Tail Procedure, in ASTM C 1521.

1.6 WARRANTY

- A. Special Installer's Warranty: 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 agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

- A. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Dow Corning Corporation; 791.
 - b. GE Construction Sealants; Momentive Performance Materials Inc; SCS2000 SilPruf.
 - c. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 265 LTS.
 - d. Pecora Corporation; PCS.
 - e. Sika Corporation U.S.; Sikasil WS-295 Sikasil WS-295 FPS.

2.3 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested according to ASTM C 1248.

- B. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Dow Corning Corporation; 795.
- b. GE Construction Sealants; Momentive Performance Materials Inc; SilPruf NB.
- c. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 295 FPS NB.
- d. Pecora Corporation.
- e. Tremco Incorporated; Spectrem 2.

2.4 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. BASF Construction Chemicals - Building Systems; Sonalastic TX1.
- b. Bostik, Inc.; Chem-Calk.
- c. Pecora Corporation; Dynatrol I-XL.
- d. Sika Corporation U.S.; Sikaflex Textured Sealant.
- e. Tremco Incorporated; Dymonic.

- B. Urethane, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. BASF Construction Chemicals - Building Systems; Sonolastic SL 1.
- b. Pecora Corporation; NR-201.
- c. Polymeric Systems, Inc.; Flexiprene 952.
- d. Schnee-Morehead, Inc.; an ITW company; Permathane SM7101.
- e. Sherwin-Williams Company (The); Stampede 1SL.

2.5 IMMERSIBLE JOINT SEALANTS

- A. Immersible Joint Sealants. Suitable for immersion in liquids; ASTM C 1247, Class 1; tested in deionized water unless otherwise indicated

- B. Urethane, Immersible, S, NS, 25, T, NT, I: Immersible, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Uses T, NT, and I.

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. Tremco Incorporated; Vulkem 116.

2.6 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Products: Subject to compliance with requirements, provide one of the following:

- a. Dow Corning Corporation; 786-M White.
- b. GE Construction Sealants; Momentive Performance Materials Inc.; SCS1700 Sanitary.
- c. May National Associates, Inc., a subsidiary of Sika Corporation U.S.; Bondaflex Sil 100 WF.

- C. Acrylic Latex: 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:

- a. BASF Construction Chemicals - Building Systems; Sonolac.
- b. Pecora Corporation; AC-20.
- c. Sherwin-Williams Company (The); 850A.

2.7 JOINT-SEALANT BACKING

- A. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) Type O (open-cell material) Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Construction Chemicals - Building Systems.
- b. Construction Foam Products, a division of Nomaco, Inc.

- B. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer.

2.8 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.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 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 laitance and form-release agents from concrete.
 - 2. 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.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.2 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with ASTM C 1193 and joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. 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.
- C. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- D. 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.

- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

- 1. Provide concave joint profile per Figure 8A in ASTM C 1193 unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

- A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

- 1. Extent of Testing: Test completed and cured sealant joints as follows:
 - a. Perform 10 tests for the first 1000 feet of joint length for each kind of sealant and joint substrate.
 - b. Perform one test for each 1000 feet of joint length thereafter or one test per each floor per elevation.
 - 2. 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.

- B. 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.

3.4 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.

- 1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Joints between different materials listed above.
 - c. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Urethane, M, P, 50, T, NT.
 - 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

- B. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces subject to water immersion.

- 1. Joint Locations:
 - a. Joints in pedestrian plazas.
 - b. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, immersible, S, P, 25, T, NT, I.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- C. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- D. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint Locations:
 - a. Isolation joints in cast-in-place concrete slabs.
 - b. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, S, P, 25, T, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- E. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:
 - a. Control and expansion joints on exposed interior surfaces of exterior walls.
 - b. Vertical joints on exposed surfaces of partitions.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Urethane, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- F. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces not subject to significant movement.
1. Joint Locations:
 - a. Control joints on exposed interior surfaces of exterior walls.
 - b. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Acrylic latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- G. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
1. Joint Locations:

- a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - b. Other joints as indicated on Drawings.
 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.
- H. Joint-Sealant Application: Concealed mastics.
1. Joint Locations:
 - a. Aluminum thresholds.
 - b. Sill plates.
 - c. Other joints as indicated on Drawings.
 2. Joint Sealant: Butyl-rubber based.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 079200

SECTION 081213 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes hollow-metal frames.
- B. Related Requirements:
 - 1. Section 081416 "Flush Wood Doors" for wood doors installed in hollow-metal frames.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings according to NAAMM-HMMA 803 or SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include elevations, frame profiles, metal thicknesses, preparations for hardware, and other details.
- C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Amweld International, LLC.
 - 2. Apex Industries, Inc.
 - 3. Ceco Door Products; an Assa Abloy Group company.
 - 4. Commercial Door & Hardware Inc.
 - 5. Curries Company; an Assa Abloy Group company.

6. Custom Metal Products.
7. Daybar Industries, Ltd.
8. Greensteel Industries, Ltd.
9. Karpen Steel Custom Doors & Frames.
10. North American Door Corp.
11. Pioneer Industries, Inc.
12. Republic Doors and Frames.
13. Steelcraft; an Ingersoll-Rand company.

2.2 REGULATORY REQUIREMENTS

- A. Fire-Rated Assemblies: Complying with NFPA 80 and listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings and temperature-rise limits indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. Smoke- and Draft-Control Assemblies: Provide an assembly with gaskets listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing according to UL 1784 and installed in compliance with NFPA 105.

2.3 INTERIOR FRAMES

- A. Standard-Duty Frames: SDI A250.8, Level 1. At locations indicated in the Door and Frame Schedule.
1. Physical Performance: Level C according to SDI A250.4.
 2. Materials: Uncoated, cold-rolled steel sheet, minimum thickness of 0.042 inch.
 3. Construction: Face welded.
 4. Exposed Finish: Prime.

2.4 EXTERIOR HOLLOW-METAL FRAMES

- A. Heavy-Duty Frames: SDI A250.8, Level 2. At locations indicated in the Door and Frame Schedule.
1. Physical Performance: Level B according to SDI A250.4.
 2. Materials: Metallic-coated steel sheet, minimum thickness of 0.053 inch, with minimum A40 coating.
 3. Construction: Face welded.
 4. Exposed Finish: Prime.

2.5 FRAME ANCHORS

- A. Jamb Anchors:

1. Stud-Wall WS Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.

2.6 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B.
- C. Frame Anchors: ASTM A 879/A 879M, Commercial Steel (CS), 04Z coating designation; mill phosphatized.
 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- E. Mineral-Fiber Insulation: ASTM C 665, Type I (blankets without membrane facing).
- F. Glazing: Comply with requirements in Section 088000 "Glazing."

2.7 FABRICATION

- 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 metal thickness. 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. Hollow-Metal Frames: 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. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 2. Jamb Anchors: Provide number and spacing of anchors as follows:
 - a. Stud-Wall SW Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c.
 3. Door Silencers: Except on weather-stripped frames, drill stops to receive door silencers.
- C. Hardware Preparation: Factory prepare hollow-metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to SDI A250.6, the Door Hardware Schedule, and templates.
 1. Reinforce frames to receive nontemplated, mortised, and surface-mounted hardware.
 2. Comply with applicable requirements in SDI A250.6 and BHMA A156.115 for preparation of hollow-metal work for hardware.

- D. Stops and Moldings: Provide stops and moldings around glazed lites and louvers where indicated. Form corners of stops and moldings with butted hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow-metal work.
 2. Multiple Glazed Lites: Provide fixed and removable stops and moldings so that each glazed lite is capable of being removed independently.
 3. Provide fixed frame moldings on outside of exterior and on secure side of interior frames.
 4. Provide loose stops and moldings on inside of hollow-metal work.
 5. Coordinate rabbet width between fixed and removable stops with glazing and installation types indicated.

2.8 STEEL FINISHES

- A. Prime Finish: Clean, pretreat, and apply manufacturer's standard primer.
1. Shop Primer: SDI A250.10.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hollow-Metal Frames: Install hollow-metal frames for doors, transoms, sidelites, borrowed lites, and other openings, of size and profile indicated. Comply with SDI A250.11 or NAAMM-HMMA 840 as required by standards specified.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumb, square, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 2. In-Place Metal or Wood-Stud Partitions: Secure slip-on drywall frames in place according to manufacturer's written instructions.
 3. Installation Tolerances: Adjust hollow-metal door frames for squareness, alignment, twist, and plumb to the following tolerances:

- a. Squareness: Plus or minus 1/16 inch, measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch, measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch, measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch, measured at jambs at floor.
- B. Glazing: Comply with installation requirements in Section 088000 "Glazing" and with hollow-metal manufacturer's written instructions.
- 1. Secure stops with countersunk flat- or oval-head machine screws spaced uniformly not more than 9 inches o.c. and not more than 2 inches o.c. from each corner.

3.2 ADJUSTING AND CLEANING

- A. Final Adjustments: Remove and replace defective work, including hollow-metal work that is warped, bowed, or otherwise unacceptable.
- B. Remove grout and other bonding material from hollow-metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surface Touchup: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.
- E. Touchup Painting: Cleaning and touchup painting of abraded areas of paint are specified in painting Sections.

END OF SECTION 081213

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Solid-core doors with wood-veneer faces.
2. Factory finishing flush wood doors.
3. Factory fitting flush wood doors to frames and factory machining for hardware.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of door. Include factory-finishing specifications.

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. Requirements for veneer matching.
6. Doors to be factory finished and finish requirements.
7. Fire-protection ratings for fire-rated doors.

C. Samples: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is a licensee of WI's Certified Compliance Program.

B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide Jeld-Wen or products by one of the following:
1. Algoma Hardwoods, Inc.
 2. Eggers Industries.
 3. Graham Wood Doors; an Assa Abloy Group company.
 4. Lambton Doors.
 5. Marshfield Door Systems, Inc.
 6. Mohawk Doors; a Masonite company.
 7. Oshkosh Door Company.
 8. VT Industries, Inc.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with AWT's, AWMAC's, and WI's "Architectural Woodwork Standards."
1. Provide WI Certified Compliance Labels indicating that doors comply with requirements of grades specified.
- B. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C.
1. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 2. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.
- C. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- D. Mineral-Core Doors:
1. Core: Noncombustible mineral product complying with requirements of referenced quality standard and testing and inspecting agency for fire-protection rating indicated.
 2. Blocking: Provide composite blocking with improved screw-holding capability approved for use in doors of fire-protection ratings indicated as needed to eliminate through-bolting hardware.
 3. Edge Construction: At hinge stiles, provide laminated-edge construction with improved screw-holding capability and split resistance. Comply with specified requirements for exposed edges.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Interior Solid-Core Doors:

1. Grade: Premium, with Grade A faces.
2. Species: Birch.
3. Cut: Rotary cut.
4. Core: Either glued or nonglued wood stave or structural composite lumber.
5. Construction: Five or seven plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering. Faces are bonded to core using a hot press.

2.4 LIGHT FRAMES AND LOUVERS

- ### A. Metal Frames for Light Openings in Fire-Rated Doors:
- Manufacturer's standard frame formed of 0.048-inch-thick, cold-rolled steel sheet; factory primed for paint finish; and approved for use in doors of fire-protection rating indicated.

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.
1. Comply with NFPA 80 requirements for fire-rated doors.
- ### B. Factory machine doors for hardware that is not surface applied.

2.6 FACTORY FINISHING

- ### A. General: 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 bottom edges, edges of cutouts, and mortises.
- ### B. Factory finish doors that are indicated to receive transparent finish.
- ### C. Transparent Finish:
1. Grade: Custom.
 2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 9, UV curable, acrylated epoxy, polyester, or urethane.
 3. Staining: As selected by Architect from manufacturer's full range.
 4. Effect: Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores.
 5. Sheen: Satin.

PART 3 - EXECUTION

3.1 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.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

END OF SECTION 081416

SECTION 083113 - ACCESS DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes access doors and frames for walls and ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each type of access door and frame and for each finish specified.
- C. Product Schedule: For access doors and frames. Use same designations indicated on Drawings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Access Doors and Frames: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection and temperature-rise limit ratings indicated, according to NFPA 252 or UL 10B.

2.2 ACCESS DOORS AND FRAMES

- A. Flush Access Doors with Exposed Flanges:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Acudor Products, Inc.
 - b. Babcock-Davis.
 - c. Cendrex Inc.
 - d. Elmdor/Stoneman Manufacturing Company; a division of Acorn Engineering Company.
 - e. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - f. Karp Associates, Inc.
 - g. Lane-Aire Manufacturing Corp.
 - h. Larsens Manufacturing Company.
 - i. Maxam Metal Products Limited.
 - j. Metropolitan Door Industries Corp.
 - k. MIFAB, Inc.
 - l. Milcor; Commercial Products Group of Hart & Cooley, Inc.

- m. Nystrom, Inc.
 - n. Williams Bros. Corporation of America (The).
- 2. Description: Face of door flush with frame, with exposed flange and concealed hinge.
 - 3. Locations: Wall.
 - 4. Uncoated Steel Sheet for Door: Nominal 0.060 inch , 16 gage, factory primed.
 - 5. Frame Material: Same material, thickness, and finish as door.
 - 6. Latch and Lock: As indicated in schedule.

2.3 FIRE-RATED ACCESS DOORS AND FRAMES

A. Fire-Rated, Flush Access Doors with Exposed Flanges:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Acudor Products, Inc.
 - b. Babcock-Davis.
 - c. Cendrex Inc.
 - d. Elmdor/Stoneman Manufacturing Company; a division of Acorn Engineering Company.
 - e. JL Industries, Inc.; a division of the Activar Construction Products Group.
 - f. Karp Associates, Inc.
 - g. Lane-Aire Manufacturing Corp.
 - h. Larsens Manufacturing Company.
 - i. Maxam Metal Products Limited.
 - j. Metropolitan Door Industries Corp.
 - k. MIFAB, Inc.
 - l. Milcor; Commercial Products Group of Hart & Cooley, Inc.
 - m. Nystrom, Inc.
 - n. Williams Bros. Corporation of America (The).
- 2. Description: Door face flush with frame, with a core of mineral-fiber insulation enclosed in sheet metal; with exposed flange, self-closing door, and concealed hinge.
- 3. Locations: Wall.
- 4. Fire-Resistance Rating: Not less than that indicated.
- 5. Temperature-Rise Rating: 450 deg F at the end of 30 minutes.
- 6. Uncoated Steel Sheet for Door: Nominal 0.036 inch , 20 gage, factory primed.
- 7. Frame Material: Same material, thickness, and finish as door.
- 8. Latch and Lock: Self-latching door hardware, as indicated in schedule.

2.4 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Steel Sheet: Uncoated or electrolytic zinc coated, ASTM A 879/A 879M, with cold-rolled steel sheet substrate complying with ASTM A 1008/A 1008M, Commercial Steel (CS), exposed.

- C. Frame Anchors: Same material as door face.
- D. Inserts, Bolts, and Anchor Fasteners: Hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

2.5 FABRICATION

- A. Metal Surfaces: For metal surfaces exposed to view in the completed Work, provide materials with smooth, flat surfaces without blemishes. Do not use materials with exposed pitting, seam marks, roller marks, rolled trade names, or roughness.
- B. Doors and Frames: Grind exposed welds smooth and flush with adjacent surfaces. Furnish mounting holes, attachment devices and fasteners of type required to secure access doors to types of supports indicated.
- C. Latch and Lock Hardware:
 - 1. Quantity: Furnish number of latches and locks required to hold doors tightly closed.
 - 2. Keys: Furnish two keys per lock and key all locks alike.

2.6 FINISHES

- A. Painted Finishes: Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
 - 1. Factory Primed: Apply manufacturer's standard, lead- and chromate-free, universal primer immediately after surface preparation and pretreatment.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing access doors and frames.
- B. Adjust doors and hardware, after installation, for proper operation.

END OF SECTION 083113

SECTION 083313 - COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Counter doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of coiling counter door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
2. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 COUNTER DOOR ASSEMBLY

A. Counter Door: Coiling counter door formed with curtain of interlocking metal slats.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Alumatec Pacific Products.

- b. C.H.I. Overhead Doors.
 - c. Lawrence Roll-Up Doors, Inc.
 - d. Overhead Door Corporation.
 - e. Raynor.
 - f. Wayne-Dalton Corp.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.
- C. Door Curtain Material: Aluminum.
- D. Door Curtain Slats: Flat profile slats of 1-1/2-inch center-to-center height.
 - 1. Perforated Slats: Approximately 1/16-inch pinholes.
- E. Bottom Bar: Manufacturer's standard 2" angle.
- F. Curtain Jamb Guides: Face mount extruded aluminum guides. Provide continuous integral wear strips to prevent metal-to-metal contact and to minimize operational noise.
- G. Hood: Match curtain material and finish.
 - 1. Mounting: As shown on Drawings.
- H. Sill Configuration: No sill.
- I. Locking Devices: Equip door with slide bolt for padlock.
- J. Manual Door Operator: Manufacturer's standard crank operator.
- K. Curtain Accessories: Equip door with pull-down strap.
- L. Door Finish:
 - 1. Aluminum Finish: Clear anodized.

2.2 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.3 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

2.4 LOCKING DEVICES

- A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

2.5 CURTAIN ACCESSORIES

- A. Pull-Down Strap: Provide pull-down straps for doors more than 84 inches high.

2.6 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.7 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install coiling counter doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Smoke-Control Doors: Install according to NFPA 80 and NFPA 105.
- C. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 083313

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Service doors.

1.2 ACTION SUBMITTALS

A. Product Data: For each type and size of overhead coiling door and accessory.

B. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
2. Show locations of controls, locking devices, and other accessories.
3. Include diagrams for power, signal, and control wiring.

C. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance, Exterior Doors: Capable of withstanding the design wind loads.

1. Design Wind Load: As indicated on Drawings.

2.2 DOOR ASSEMBLY

- A. Door: Overhead coiling door formed with curtain of interlocking metal slats.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Alumatec Pacific Products.
 - b. C.H.I. Overhead Doors.
 - c. City-Gates.
 - d. Lawrence Roll-Up Doors, Inc.
 - e. Overhead Door Corporation.
 - f. Raynor.
 - g. Wayne-Dalton Corp.
- B. Operation Cycles: Door components and operators capable of operating for not less than 20,000.
- C. Door Curtain Material: Aluminum.
- D. Door Curtain Slats: Type T; Flat profile slats of 2-5/8-inch center-to-center height and 3/4 inch thickness.
 - 1. Vision Lites of 4" x 1 1/2" Cut-outs covered with plexiglass.
- E. Bottom Bar: Two angles, each not less than 1-1/2 by 1-1/2 by 1/8 inch thick; fabricated from hot-dip galvanized steel or aluminum extrusions and finished to match door.
- F. Curtain Jamb Guides: Aluminum with exposed finish matching curtain slats. Face Mount E-Guide.
- G. Hood: Match curtain material and finish.
 - 1. Mounting: As shown on Drawings.
- H. Locking Devices: Equip door with chain lock keeper.
- I. Manual Door Operator: Chain-hoist operator.
- J. Curtain Accessories: Equip door with weatherseals push/pull handles.
- K. Door Finish:
 - 1. Baked-Enamel or Powder-Coated Finish: Color as selected by Architect from manufacturer's full range.

2.3 MATERIALS, GENERAL

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.4 DOOR CURTAIN MATERIALS AND CONSTRUCTION

- A. Curtain Jamb Guides: Manufacturer's standard angles or channels and angles of same material and finish as curtain slats unless otherwise indicated, with sufficient depth and strength to retain curtain, to allow curtain to operate smoothly, and to withstand loading. Slot bolt holes for guide adjustment. Provide removable stops on guides to prevent overtravel of curtain.

2.5 HOODS

- A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

2.6 LOCKING DEVICES

- A. Chain Lock Keeper: Suitable for padlock.

2.7 CURTAIN ACCESSORIES

- A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.
- B. Push/Pull Handles: Equip each push-up-operated or emergency-operated door with lifting handles on each side of door, finished to match door.

2.8 COUNTERBALANCING MECHANISM

- A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.
- B. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.9 MANUAL DOOR OPERATORS

- A. General: Equip door with manual door operator by door manufacturer.
- B. Chain-Hoist Operator: Consisting of endless steel hand chain, chain-pocket wheel and guard, and gear-reduction unit with a maximum 25-lbf force for door operation. Provide alloy-steel hand chain with chain holder secured to operator guide.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.
- B. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion. Lubricate bearings and sliding parts as recommended by manufacturer. Adjust seals to provide tight fit around entire perimeter.

3.2 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior storefront framing.
2. Exterior manual-swing entrance doors and door-frame units.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

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

- B. Shop Drawings: Include plans, elevations, sections, full-size details, and attachments to other work.

1. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

- C. Samples: For each exposed finish required.

1.4 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.

- B. Product test reports.

- C. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.
- B. 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.

1.7 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. Warranty Period: Five 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.
 - 1. Aluminum-framed entrances and storefronts 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 Drawings.
 - 2. Other Design Loads: As indicated on 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.

D. 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.
2. Entrance Doors:
 - a. Single Doors: Maximum air leakage of 0.5 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

E. Energy Performance: Certify and label energy performance according to NFRC as follows:

1. Thermal Transmittance (U-factor): Fixed glazing and framing areas shall have U-factor of not more than 0.57 Btu/sq. ft. x h x deg F as determined according to NFRC 100.
2. Condensation Resistance: Fixed glazing and framing areas shall have an NFRC-certified condensation resistance rating of no less than 25 as determined according to NFRC 500.

F. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Cascade Aluminum or comparable product by one of the following:

1. Arcadia, Inc.
2. Arch Aluminum & Glass Co., Inc.
3. EFCO Corporation.
4. Kawneer North America.
5. YKK AP America Inc.

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. Construction: Thermally broken.
 2. Glazing System: Retained mechanically with gaskets on four sides.
 3. Glazing Plane: Front.
 4. Finish: Baked-enamel or powder-coat finish.
 5. Fabrication Method: Field-fabricated stick system.
- 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 ENTRANCE DOOR SYSTEMS

- A. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing operation.
1. Door Construction: 1-3/4-inch overall thickness, with minimum 0.125-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.
 2. Door Design: As indicated.
 3. Glazing Stops and Gaskets: Beveled, snap-on, extruded-aluminum stops and preformed gaskets.

2.5 ENTRANCE DOOR HARDWARE

- A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

- B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door to comply with requirements in this Section.
 - 1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products complying with BHMA standard referenced.
 - 2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
 - 3. Opening-Force Requirements:
 - a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
 - b. Accessible Interior Doors: Not more than 5 lbf to fully open door.
- C. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of entrance door hardware are indicated in "Entrance Door Hardware Sets" Article. Products are identified by using entrance door hardware designations as follows:
 - 1. References to BHMA Standards: Provide products complying with these standards and requirements for description, quality, and function.
- D. Operating Trim: BHMA A156.6.
- E. Thresholds: BHMA A156.21, raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

2.6 GLAZING

- A. Glazing: Comply with Section 088000 "Glazing."
- B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.
- C. Glazing Sealants: As recommended by manufacturer.

2.7 FABRICATION

- A. Form or extrude aluminum shapes before finishing.
- B. 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.

- C. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.
- D. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.
- E. Entrance Doors: Reinforce doors as required for installing entrance door hardware.
- F. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.8 ALUMINUM FINISHES

- A. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils.
 - 1. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 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.
- 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. Entrance Doors: Install doors to produce smooth operation and tight fit at contact points.
1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
 2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

END OF SECTION 084113

SECTION 085313 - VINYL WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes vinyl-framed windows.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Include plans, elevations, sections, hardware, accessories, insect screens, operational clearances, and details of installation, including anchor, flashing, and sealant installation.
- C. Samples: For each exposed product and for each color specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranties.

1.4 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace vinyl windows that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period:
 - a. Window: 10 years from date of Substantial Completion.
 - b. Glazing Units: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 WINDOW PERFORMANCE REQUIREMENTS

- A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.
 - 1. Window Certification: WDMA certified with label attached to each window.

- B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
 - 1. Minimum Performance Class: As indicated on Drawings.
 - 2. Minimum Performance Grade: 60.
- C. Thermal Transmittance: NFRC 100 maximum whole-window U-factor of 0.32 Btu/sq. ft. x h x deg F.
- D. Solar Heat-Gain Coefficient (SHGC): NFRC 200 maximum whole-window SHGC of 0.40.

2.2 VINYL WINDOWS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Ply-Gem or equal products.
- B. Operating Types: As indicated on Drawings.
- C. Frames and Sashes: Impact-resistant, UV-stabilized PVC complying with AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Finish: Integral color, white.
 - 2. Gypsum Board Returns: Provide at interior face of frame.
- D. Glass: Clear annealed glass, ASTM C 1036, Type 1, Class 1, q3.
 - 1. Kind: Fully tempered where indicated on Drawings.
- E. Insulating-Glass Units: ASTM E 2190.
 - 1. Glass: ASTM C 1036, Type 1, Class 1, q3.
 - a. Kind: Fully tempered where indicated on Drawings.
 - 2. Lites: Two.
 - 3. Filling: Fill space between glass lites with air.
 - 4. Low-E Coating: Sputtered on second or third surface.
- F. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.
- G. Hardware, General: Provide manufacturer's standard corrosion-resistant hardware sized to accommodate sash weight and dimensions.
 - 1. Exposed Hardware Color and Finish: As selected by Architect from manufacturer's full range.
- H. Projected Window Hardware:

1. Gear-Type Rotary Operators: Complying with AAMA 901 when tested according to ASTM E 405, Method A. Provide operators that function without requiring the removal of interior screens or using screen wickets.

- a. Type and Style: As selected by Architect from manufacturer's full range of types and styles.

2. Hinges: Manufacturer's standard type for sash weight and size indicated.

- I. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.

- J. Fasteners: Noncorrosive and compatible with window members, trim, hardware, anchors, and other components.

2.3 INSECT SCREENS

- A. General: Fabricate insect screens to integrate with window frame. Provide screen for each operable exterior sash. Screen wickets are not permitted.

1. Type and Location: Full, inside for project-out sashes.

- B. Aluminum Frames: Complying with SMA 1004 or SMA 1201.

1. Finish for Interior Screens: Baked-on organic coating in color selected by Architect from manufacturer's full range.

2.4 FABRICATION

- A. Fabricate vinyl windows in sizes indicated. Include a complete system for installing and anchoring windows.

- B. Glaze vinyl windows in the factory.

- C. Weather strip each operable sash to provide weathertight installation.

- D. Hardware: Mount hardware through double walls of vinyl extrusions or provide corrosion-resistant reinforcement.

- E. Complete fabrication, assembly, finishing, hardware application, and other work in the factory to greatest extent possible. Disassemble components only as necessary for shipment and installation. Allow for scribing, trimming, and fitting at Project site.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's written instructions for installing windows, hardware, accessories, and other components. For installation procedures and requirements not addressed in manufacturer's written instructions, comply with installation requirements in ASTM E 2112.
- B. Install windows level, plumb, square, true to line, without distortion, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction to produce weathertight construction.
- C. Adjust operating sashes and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure.
- D. Clean exposed surfaces immediately after installing windows. Remove excess sealants, glazing materials, dirt, and other substances.
- E. Remove and replace sashes if glass has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 085313

SECTION 087000 - HARDWARE AND SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:

1. Commercial door hardware.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Samples: For each exposed finish.
- C. Door Hardware Schedule: Organized into door hardware sets indicating type, style, function, size, label, hand, manufacturer, fasteners, location, and finish of each door hardware item.
- D. Product certificates.

1.3 QUALITY ASSURANCE

- A. Supplier Qualifications: Person who is or employs a qualified DHI Architectural Hardware Consultant.
- B. Keys: Deliver keys to Owner.
- C. Standards: Comply with BHMA A156 series standards, Grade 1, unless Grade 2 is indicated.
- D. Certified Products: Provide door hardware that is listed in BHMA directory of certified products.

PART 2 - PRODUCTS

2.1 PIVOTS AND HINGES

- A. Manufacturers:
1. Hinges:
 - a. Hager Hinge Company.
 - b. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK).

2. Pivot Hinges:

- a. Standard off set pivot hinges by Kawneer.
- B. General: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.
- C. Hinge Base Metal: Unless otherwise indicated, provide the following:
 - 1. Exterior Hinges: by Kawneer, supplied with storefront.
 - 2. Interior Hinges
- D. Screws: Phillips flat-head screws; screw heads finished to match surface of hinges.
 - 1. Metal Doors and Frames: Machine screws (drilled and tapped holes).

2.2 MECHANICAL LOCKS AND LATCHES

- A. Manufacturers:
 - 1. Schlage Lock Company; an Ingersoll-Rand Company (SCH).
 - 2. Yale Security Inc.; Div. of Williams Holdings (YAL).
- B. Backset: 2-3/4 inches, unless otherwise indicated.

2.3 OPERATING TRIM

- A. Push-Pull Design:
 - 1. Manufacturers:
 - a. By Kawneer, supplied with storefront.

2.4 CLOSERS

- A. Surface-Mounted Closers:
 - 1. Manufacturers:
 - a. Norton door controls, Div. of Yale Security Inc.
 - b. LCN Closers, an Ingersoll-Rand Company (LCN)
- B. Size of Units: Factory-sized, adjustable to meet field conditions and requirements for opening force.

2.5 STOPS AND HOLDERS

- A. Stops and Holders: Provide floor stops for doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.

1. Manufacturers:

- a. Ives, H. B. (IVS)
- b. Baldwin Hardware Corporation (BH).
- c. Hager Companies (HAG)
- d. Schlage Lock Company; an Ingersoll-Rand Company (SCH).

2.6 DOOR GASKETING AND THRESHOLDS

- A. Door Gasketing: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

1. Manufacturers:

a. Gasketing:

2. Pemko Manufacturing Co., Inc. (PEM).
3. Air Leakage: Not to exceed 0.50 cfm per foot of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.
4. Sound-Rated Gasketing: Assemblies that are listed and labeled, based on testing according to ASTM E 1408.
5. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.

- B. Thresholds: Of type scheduled or indicated.

1. Manufacturers:

- a. Pemko Manufacturing Co., Inc. (PEM).

2.7 CYLINDERS, KEYING, AND STRIKES

- A. Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.

1. Manufacturers:

- a. Same manufacturer as for locks and latches.

2. Number of Pins: Seven.
3. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
4. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

- a. Furnish permanent cores to Owner for installation.
- B. Keying System: Factory-registered keying system; grand master key system.
 - 1. Keys: Provide nickel-silver keys permanently inscribed with a visual key control number and "DO NOT DUPLICATE" notation. In addition to one extra blank key for each lock, provide three change keys and five grand master keys.
- C. Strikes: 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.

2.8 FABRICATION

- A. Base Metals: Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials if different from specified standard.
- B. Fasteners: Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated. Provide steel machine or wood screws or steel through bolts for fire-rated applications.
- C. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."
- D. Finishes: Comply with BHMA A156.18.

2.9 HARDWARE SCHEDULE

QTY	UNIT	DESCRIPTION	MFR	PART #	FINISH
HARDWARE GROUP 1 – Exterior Entry (5 ea) Lobby, Corridor 1, Lunch, Crew, Parts					
3	ea	Hinges	SELECT HINGE	SL31HD83	613
1	ea	Dual Cylinder	SCHLAGE	B662P	613
2	ea	Push Bar	HARNISCH	4E-233	613
1	ea	Closer	NORTON	7500 690 SNB	613
1	ea	Threshold	PEMKO	176D	613
1	ea	Weatherstrip	PEMKO	S88D	
HARDWARE GROUP 2 – Interior Entry (9 ea) Offices 1, 2, & 3, Billing, File Storage, Corridor 2, Crew, Mechanical, Storage					
3	ea	Hinges	MCK	TA2714 4.5 X 4.5	613
1	ea	Stop	SCHLAGE	SC61B	613
3	ea	Silencer	IVES	SR65	613
1	ea	Entry Lockset	SCHLAGE	AL50PD SAT	613
HARDWARE GROUP 3 – Passage (2 ea) Lunch, Meeting					
3	ea	Hinges	MCK	TA2714 4.5 X 4.5	613
1	ea	Passage Lockset	SCHLAGE	AL10S SAT	613

1	ea	Stop	SCHLAGE	SC61B	613
3	ea	Silencer	IVES	SR65	613

HARDWARE GROUP 4 – Privacy. (3 ea) Toilets 1,2, & 3

3	ea	Hinges	MCK	TA2714 4.5 X 4.5	613
1	ea	Privacy Lockset	SCHLAGE	AL40S SAT	613
1	ea	Deadbolt w/ Occupancy	SCHLAGE	B571	613
1	ea	Stop	SCHLAGE	SC61B	613
3	ea	Silencer	IVES	SR65	613
1	ea	Closer	NORTON	7500 690 SNB	613

HARDWARE GROUP 5 – Gate (1 ea) Mezzanine

4	ea	Hinges	STANLEY	CD1291	US1D
1	ea	Cane Bolt	LAWRENCE	L250S-24"	ZN
1	ea	Latch	LAWRENCE	C238S	ZN
2	ea	Snap End	VISIONTRON	852SNAP	SS
2	ea	Quick Link Screw Lock	VISIONTRON	852QL	SS
10	ft	Welded Links, Chain	VISIONTRON	852SS	SS
2	ea	Eye Screw	FASTENALL	11101361	SS

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- B. Steel Door and Frame Preparation: Comply with DHI A115 series. Drill and tap doors and frames for surface-applied hardware according to SDI 107.
- C. Wood Door Preparation: Comply with DHI A115-W series.
- D. Mounting Heights: Comply with the following requirements, unless otherwise indicated:
 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
- E. Adjust and reinforce attachment substrates as necessary for proper installation and operation. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
 1. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- F. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with accessibility requirements.

1. Door Closers: Adjust sweep period so that from an open position of 70 degrees, the door will take at least three seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.

3.2 FIELD QUALITY CONTROL

- A. Inspections: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.

END OF SECTION 087000

SECTION 088000 - GLAZING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Glass for doors interior borrowed lites.
 - 2. Glazing sealants and accessories.

1.2 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Glass Samples: For each type of glass product other than clear monolithic vision glass; 12 inches square.
- C. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

1.4 INFORMATIONAL SUBMITTALS

- A. Preconstruction adhesion and compatibility test report.

1.5 QUALITY ASSURANCE

- A. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion and Compatibility Testing: Test each glass product, tape sealant, gasket, glazing accessory, and glass-framing member for adhesion to and compatibility with elastomeric glazing sealants.
 - 1. Testing is not required if data are submitted based on previous testing of current sealant products and glazing materials matching those submitted.

1.7 WARRANTY

- A. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Glass Product: Subject to compliance with requirements, provide product indicated in glass schedules or comparable product by one of the following:
1. AGC Glass Company North America, Inc.
 2. Cardinal Glass Industries.
 3. General Glass International.
 4. Hartung Glass Industries.
 5. National Association.
 6. Oldcastle BuildingEnvelope.
 7. PPG Industries, Inc.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.
- B. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined according to the International Building Code and ASTM E 1300.
1. Design Wind Pressures: As indicated on Drawings.
 2. Differential Shading: Design glass to resist thermal stresses induced by differential shading within individual glass lites.
- C. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.
- D. 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. 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.

2. 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.
3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

- A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 1. GANA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."
- B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
- C. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than the thickness indicated.
- D. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

- A. Clear Annealed Float Glass: ASTM C 1036, Type I, Class 1 (clear), Quality-Q3.
- B. Fully Tempered Float Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

2.5 LAMINATED GLASS

- A. Laminated Glass: ASTM C 1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.
 1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
 2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
 3. Interlayer Color: Clear unless otherwise indicated.

2.6 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they 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. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

2.7 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.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.8 MISCELLANEOUS GLAZING MATERIALS

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.

C. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).

D. 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.

PART 3 - EXECUTION

3.1 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. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.
- C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- D. 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.
- E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- F. Provide spacers for glass lites where length plus width is larger than 50 inches.
- G. 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.

3.2 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, then to jambs. Cover horizontal framing joints by applying tapes to jambs, 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. Apply heel bead of elastomeric sealant.
- F. 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.
- G. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.3 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.

3.4 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.

3.5 CLEANING AND PROTECTION

- A. Immediately after installation remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. 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.
 - 1. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

- C. Remove and replace glass that is damaged during construction period.

3.6 MONOLITHIC GLASS SCHEDULE

- A. Glass Type: Clear annealed or fully tempered float glass as indicated.
 - 1. Minimum Thickness: 6 mm.
 - 2. Safety glazing required.

3.7 LAMINATED GLASS SCHEDULE

- A. Glass Type: Clear laminated glass with two plies of annealed float glass.
 - 1. Minimum Thickness of Each Glass Ply: As indicated.
 - 2. Interlayer Thickness: 0.030 inch.
 - 3. Safety glazing required.

END OF SECTION 088000

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Texture finishes.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each texture finish indicated on same backing indicated for Work.

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. Ceiling and wall materials shall comply with the requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

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.

2.3 INTERIOR GYPSUM BOARD

- A. Gypsum Board, Type X: ASTM C 1396/C 1396M.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. CertainTeed Corporation.

- c. Continental Building Products, LLC.
 - d. Georgia-Pacific Building Products.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple-Inland Building Products by Georgia-Pacific.
 - h. USG.
 - 2. Thickness: 5/8 inch.
 - 3. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
- B. Gypsum Ceiling Board: ASTM C 1396/C 1396M.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. CertainTeed Corporation.
 - c. Continental Building Products, LLC.
 - d. Georgia-Pacific Building Products.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple-Inland Building Products by Georgia-Pacific.
 - h. USG.
 - 2. Thickness: 1/2 inch.
 - 3. Long Edges: Tapered.
- C. Mold-Resistant Gypsum Board: ASTM C 1396/C 1396M. With moisture- and mold-resistant core and paper surfaces.
- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. American Gypsum.
 - b. CertainTeed Corporation.
 - c. Continental Building Products, LLC.
 - d. Georgia-Pacific Building Products.
 - e. National Gypsum Company.
 - f. PABCO Gypsum.
 - g. Temple-Inland Building Products by Georgia-Pacific.
 - h. USG.
 - 2. Core: As indicated.
 - 3. Long Edges: Tapered.
 - 4. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.

2.4 TRIM ACCESSORIES

- A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, 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.

2.5 JOINT TREATMENT MATERIALS

- A. General: Comply with ASTM C 475/C 475M.
- B. Joint Tape:
 1. Interior Gypsum Board: Paper.
- 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. Prefilling: At open joints and damaged surface areas, use setting-type taping compound.
 2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.
 - a. Use setting-type compound for installing paper-faced metal trim accessories.
 3. Fill Coat: For second coat, use drying-type, all-purpose compound.
 4. Finish Coat: For third coat, use drying-type, all-purpose compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
- C. 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.

- D. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Accumetric LLC.
 - b. Grabber Construction Products.
 - c. Hilti, Inc.
 - d. Pecora Corporation.
 - e. Specified Technologies, Inc.
 - f. United States Gypsum Company.
- E. Thermal Insulation: As specified in Section 072100 "Thermal Insulation."
- F. Vapor Retarder: As specified in Section 072600 "Vapor Retarders."

2.7 TEXTURE FINISHES

- A. Primer: As recommended by textured finish manufacturer.
- B. Aggregate Finish: Water-based, job-mixed, aggregated, drying-type texture finish for spray application.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. Georgia-Pacific Building Products.
 - c. National Gypsum Company.
 - d. United States Gypsum Company.
 - 2. Texture: Very light orange peel.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C 840.

- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch-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.
- D. 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.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. 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 Section 099123 "Interior Painting."
 - 5. Level 5: Where indicated on Drawings.
 - a. Primer and its application to surfaces are specified in Section 099123 "Interior Painting."
- H. Glass-Mat Faced Panels: Finish according to manufacturer's written instructions.

3.2 APPLYING TEXTURE FINISHES

- A. Surface Preparation and Primer: Prepare and apply primer to gypsum panels and other surfaces receiving texture finishes. Apply primer to surfaces that are clean, dry, and smooth.

3.3 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.
- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

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.

1.4 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.
- B. Product test reports.
- C. Research reports.
- D. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 ACOUSTICAL PANELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. American Gypsum.
 - 2. Armstrong World Industries, Inc.

3. CertainTeed Corporation.
4. Chicago Metallic Corporation.
5. Tectum Inc.
6. United States Gypsum Company.

- B. Acoustical Panel Standard: Manufacturer's standard panels according to ASTM E 1264.
- C. Classification: Fine Fissured Second Look, Scored Tegular.
- D. Color: As selected from manufacturer's full range.
- E. Edge/Joint Detail: 15/16" Angled Tegular.
- F. Thickness: 3/4 inch.
- G. Modular Size: 24 inches by 48 inches.

2.2 METAL SUSPENSION SYSTEM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Prelude XL Fire Guard or comparable product by one of the following:
1. Armstrong World Industries, Inc.
 2. CertainTeed Corporation.
 3. Chicago Metallic Corporation.
 4. United States Gypsum Company.
- B. Metal Suspension-System Standard: Manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M.

2.3 ACCESSORIES

- A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.

2.4 METAL EDGE MOLDINGS AND TRIM

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
1. Armstrong World Industries, Inc.
 2. CertainTeed Corporation.
 3. Chicago Metallic Corporation.
 4. Fry Reglet Corporation.
 5. Gordon, Inc.
 6. United States Gypsum Company.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated.
- B. Layout openings for penetrations centered on the penetrating items.

3.2 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Do not use exposed fasteners, including pop rivets, on moldings and trim.
 - 3. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.
 - b. Install panels with pattern running in one direction parallel to long axis of space.
 - c. Install panels in a basket-weave pattern.
 - 4. Install clips in areas indicated; space according to panel manufacturer's written instructions unless otherwise indicated.

END OF SECTION 095113

SECTION 096516 - RESILIENT SHEET FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes vinyl sheet flooring.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For each type of flooring. Include flooring layouts, locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
 - 1. Show details of special patterns.
- C. Samples: For each exposed product and for each color and texture specified in manufacturer's standard size, but not less than 6-by-9-inch sections.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: For resilient sheet flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

2.2 UNBACKED VINYL SHEET FLOORING

- A. Products: Subject to compliance with requirements, provide Flexitec Blueprint by IVC US or approved equal by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Forbo Industries, Inc.
 - 3. Johnsonite; A Tarkett Company.
 - 4. Mannington Mills, Inc.

- B. Product Standard: ASTM F 1913.
- C. Thickness: 0.080 inch.
- D. Wearing Surface: Smooth.
- E. Sheet Width: As standard with manufacturer.
- F. Style: Modus.
- G. Colors and Patterns: As selected by Architect from full range of industry colors.

2.3 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by resilient sheet flooring manufacturer for applications indicated.
- B. Adhesives: Water-resistant type recommended by flooring and adhesive manufacturers to suit resilient sheet flooring and substrate conditions indicated.
- C. Floor Polish: Provide protective, liquid floor-polish products recommended by resilient sheet flooring manufacturer.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare substrates according to resilient sheet flooring manufacturer's written instructions to ensure adhesion of resilient sheet 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 adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by resilient sheet flooring manufacturer. Do not use solvents.
 - 3. Alkalinity and Adhesion Testing: Perform tests recommended by resilient sheet 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: Proceed with installation only after substrates pass testing according to resilient sheet flooring manufacturer's written recommendations, 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 a 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 resilient sheet flooring until it is the same temperature as the space where it is to be installed.
- E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient sheet flooring.

3.2 RESILIENT SHEET FLOORING INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient sheet flooring.
- B. Unroll resilient sheet flooring and allow it to stabilize before cutting and fitting.
- C. Lay out resilient sheet flooring as follows:
 - 1. Maintain uniformity of flooring direction.
 - 2. Minimize number of seams; place seams in inconspicuous and low-traffic areas, at least 6 inches away from parallel joints in flooring substrates.
 - 3. Match edges of flooring for color shading at seams.
 - 4. Avoid cross seams.
- D. Scribe and cut resilient sheet flooring to butt neatly and tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, and door frames.
- E. Extend resilient sheet flooring into toe spaces, door reveals, closets, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on resilient sheet flooring as marked on substrates. Use chalk or other nonpermanent marking device.
- G. Install resilient sheet flooring on covers for telephone and electrical ducts and similar items in installation 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.
- H. Adhere resilient sheet 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.

3.3 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting resilient sheet flooring.

- B. Cover resilient sheet flooring until Substantial Completion.

END OF SECTION 096516

SECTION 096813 - TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes modular carpet tile.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For carpet tile installation, plans showing the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of installation.
 - 4. Pattern of installation.
 - 5. Pattern type, location, and direction.
 - 6. Type, color, and location of edge, transition, and other accessory strips.
 - 7. Transition details to other flooring materials.
- C. Samples: For each exposed product and for each color and texture required.

1.3 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Certified by the International Certified Floorcovering Installers Association at the Commercial II certification level.

1.6 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 CARPET TILE

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product of J&J Invision or comparable product by one of the following:
 - 1. J&J Invision; J&J Industries, Inc.
 - 2. Mannington Mills, Inc.
 - 3. Milliken & Company.
 - 4. Mohawk Group (The); Mohawk Carpet, LLC.
 - 5. Patcraft; a division of Shaw Industries, Inc.
 - 6. PhillyQueen; a division of Shaw Industries, Inc.
 - 7. Shaw Contract Group; a Berkshire Hathaway company.
 - 8. Tandus; a Tarkett company.
- B. Color: 385 Ringmaster.
- C. Style: Flying Trapeze.

2.2 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that comply with flammability requirements for installed carpet tile, and are recommended by carpet tile manufacturer for releasable installation.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Concrete Slabs:
 - 1. Moisture Testing: Perform tests so that each test area does not exceed 200 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

- a. Anhydrous Calcium Chloride Test: 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. Relative Humidity Test: Using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.
 - c. Perform additional moisture tests recommended in writing by adhesive and carpet tile manufacturers. Proceed with installation only after substrates pass testing.
- B. Wood Subfloors: Verify that underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.

3.2 PREPARATION

- A. General: Comply with CRI's "CRI Carpet Installation Standards" and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile.
- 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 cracks, 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. Concrete Substrates: Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by adhesive and carpet tile manufacturers.
- D. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI's "CRI Carpet Installation Standard," Section 18, "Modular Carpet" and with carpet tile manufacturer's written installation instructions.
- 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. Maintain pile-direction patterns indicated on Drawings.
- E. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- F. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

- G. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on carpet tile as marked on subfloor. Use nonpermanent, nonstaining marking device.
- H. Install pattern parallel to walls and borders.
- I. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 096813

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Fiber-cement board.
 - 2. Wood.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and each color and gloss of topcoat.

1.3 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Behr Process Corporation.

2. Benjamin Moore & Co.
3. Glidden Professional.
4. Kelly-Moore Paint Company Inc.
5. Parker Paint; Comex Group.
6. PPG Architectural Finishes, Inc.
7. Pratt & Lambert.
8. Rodda Paint Co.
9. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
10. Sherwin-Williams Company (The).
11. Zinsser; Rust-Oleum Corporation.

- B. Products: Subject to compliance with requirements, provide one of the products listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

- B. Colors: By Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
1. Fiber-Cement Board: 12 percent.
 2. Wood: 15 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
- B. 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.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Cement Board Substrates:
 - 1. Alkyd System:
 - a. Prime Coat: Primer, latex for exterior wood.
 - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
 - c. Topcoat: Alkyd, exterior, flat (MPI Gloss Level 5).
- B. Wood Substrates: Wood trim Architectural woodwork Doors Windows Wood board siding wood fences.
 - 1. Alkyd System:
 - a. Prime Coat: Primer, alkyd for exterior wood.
 - b. Intermediate Coat: Exterior, alkyd enamel, matching topcoat.
 - c. Topcoat: Alkyd, exterior, flat (MPI Gloss Level 5).

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 099113

SECTION 099123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Steel and iron.
 - 2. Wood.
 - 3. Gypsum board.
 - 4. Plaster.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of paint system and in each color and gloss of topcoat.

1.3 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each paint system indicated and each color and finish selected to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each paint system.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 100 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of color selections will be based on mockups.
 - a. If preliminary color selections are not approved, apply additional mockups of additional colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. California Paints.
4. Conco Paints.
5. Coronado Paint; Benjamin Moore Company.
6. Diamond Vogel Paints.
7. Dulux (formerly ICI Paints); a brand of AkzoNobel.
8. Dunn-Edwards Corporation.
9. Duron, Inc.
10. Frazee Paint; Comex Group.
11. Glidden Professional.
12. Kelly-Moore Paint Company Inc.
13. Kwal Paint; Comex Group.
14. M.A.B. Paints.
15. Parker Paint; Comex Group.
16. PPG Architectural Finishes, Inc.
17. Pratt & Lambert.
18. Rodda Paint Co.
19. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
20. Sherwin-Williams Company (The).
21. Zinsser; Rust-Oleum Corporation.

- B. Products: Subject to compliance with requirements, provide one of the products listed in the Interior Painting Schedule for the paint category indicated.

2.2 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

- B. Colors: By Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:

1. Wood: 15 percent.
 2. Gypsum Board: 12 percent.
 3. Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions.
- B. 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.

3.4 INTERIOR PAINTING SCHEDULE

- A. Steel Substrates:
1. Latex over Shop-Applied Quick-Drying Shop Primer System:
 - a. Prime Coat: Primer, quick dry, for shop application.
 - b. Intermediate Coat: Latex, interior, matching topcoat.
 - c. Topcoat: Latex, interior (MPI Gloss Level 3).
- B. Wood Substrates: Exposed framing.
1. Latex over Latex Primer System:
 - a. Prime Coat: Primer, latex, for interior wood.
 - b. Topcoat: Latex, interior.

C. Wood Substrates: Wood trim, Architectural woodwork, Doors, and Windows.

1. Latex over Alkyd Primer System:

- a. Prime Coat: Primer sealer, alkyd, interior.
- b. Intermediate Coat: Latex, interior, matching topcoat.
- c. Topcoat: Latex, interior (MPI Gloss Level 3).

D. Gypsum Board and Plaster Substrates:

1. Latex over Latex Sealer System:

- a. Prime Coat: Primer sealer, latex, interior.
- b. Prime Coat: Latex, interior, matching topcoat.
- c. Intermediate Coat: Latex, interior, matching topcoat.
- d. Topcoat: Latex, interior (MPI Gloss Level 3).

END OF SECTION 099123

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and application of wood stains and transparent finishes on the following substrates:
 - 1. Interior Substrates:
 - a. Dressed lumber (finish carpentry or woodwork).

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples: For each type of finish system and in each color and gloss of finish required.

1.3 QUALITY ASSURANCE

- A. Mockups: Apply mockups of each finish system indicated and each color selected to verify preliminary selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.
 - 1. Architect will select one surface to represent surfaces and conditions for application of each type of finish system and substrate.
 - a. Vertical and Horizontal Surfaces: Provide samples of at least 200 sq. ft..
 - b. Other Items: Architect will designate items or areas required.
 - 2. Final approval of stain color selections will be based on mockups.
 - a. If preliminary stain color selections are not approved, apply additional mockups of additional stain colors selected by Architect at no added cost to Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Behr Process Corporation.
2. Benjamin Moore & Co.
3. Glidden Professional.
4. Kelly-Moore Paint Company Inc.
5. Minwax.
6. Parker Paint; Comex Group.
7. PPG Architectural Finishes, Inc.
8. Pratt & Lambert.
9. Rodda Paint Co.
10. Rust-Oleum Corporation; a subsidiary of RPM International, Inc.
11. Sherwin-Williams Company (The).
12. Zinsser; Rust-Oleum Corporation.
13. Insert manufacturer's name.

- B. Products: Subject to compliance with requirements, provide one of the products listed in wood finish systems schedules for the product category indicated.

2.2 MATERIALS, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

- B. Stain Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Exterior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- C. Maximum Moisture Content of Interior Wood Substrates: 15 percent, when measured with an electronic moisture meter.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with finish application only after unsatisfactory conditions have been corrected.

1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- C. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.
 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD -FINISH-SYSTEM SCHEDULE

- A. Wood Substrates: Wood trim windows.
 1. Polyurethane Varnish over Stain System:
 - a. Stain Coat: Stain, semitransparent, for interior wood.

- b. First Intermediate Coat: Polyurethane varnish matching topcoat.
- c. Second Intermediate Coat: Polyurethane varnish matching topcoat.

END OF SECTION 099300

SECTION 101400 - SIGNAGE

PART 1 - GENERAL

- A. Work included: Provide signage as shown schematically on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Specific design work to be performed by bidder and approved by Architect.

PART 2 - SUBMITTALS

- A. Provide shop drawings in sufficient detail to show installation and anchorage of the work of this Section with that of adjacent trades.

PART 3 - PRODUCTS

- A. Provide door signage by Seton, P.O. Box 1331, New Haven, Ct. 06505. 1-800-345-7819

Restrooms (x3)	Entry Door	66725
Lobby	Entry Door	Custom Regal Braille ADA Facility Signs Sign will say "PRIVATE".
Meeting	Entry Door	Custom Regal Braille ADA Facility Signs Sign will say "MEETING ROOM".

- B. Exterior Signage: Gemini Incorporated.

- 1. Cast Aluminum
- 2. Optima 6"
- 3. Dark Anodized
- 4. Projected Spacer Mounting

- C. Mezzanine Loading Dock: SafetySign.com

- 1. 10" x 14" Outdoor Durable Plastic E2275

- D. Provide Site signage by Seton, P.O. Box 1331, New Haven, Ct. 06505. 1-800-345-7819

Driveway	Entry Only	L5843S08STDRAE
Driveway	Exit Only	L5846S08STDRAE
Handicap Parking (x2)	Handicap	84881
Handicap Parking	Van Accessible	L6605S01STDRAE

PART 4 - EXECUTION

- A. Install as per manufacturer's instructions.
- B. Verify signage style and color with Architect prior to installation.

END OF SECTION 101400

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.
 - 2. Underlavatory guards.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: Full size, for each exposed product and for each finish specified.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 WARRANTY

- A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Toilet Tissue (Roll) Dispenser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A&J Washroom Accessories, Inc.
 - b. American Specialties, Inc.; ASI Group.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.
 - e. Brey-Krause Manufacturing Co.
 - f. GAMCO Specialty Accessories; a division of Bobrick.
 - g. Tubular Specialties Manufacturing, Inc.
2. Description: Double-roll dispenser.
3. Mounting: Surface mounted.
4. Operation: Noncontrol delivery with standard spindle.
5. Capacity: Designed for 4-1/2- or 5-inch-diameter tissue rolls.
6. Material and Finish: Stainless steel, No. 4 finish (satin).

B. Paper Towel (Folded) Dispenser:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A&J Washroom Accessories, Inc.
 - b. American Specialties, Inc.; ASI Group.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.
 - e. Brey-Krause Manufacturing Co.
 - f. GAMCO Specialty Accessories; a division of Bobrick.
 - g. Seachrome Corporation.
 - h. Tubular Specialties Manufacturing, Inc.
2. Mounting: Surface mounted.
3. Minimum Capacity: 400 C-fold or 525 multifold towels.
4. Material and Finish: Stainless steel, No. 4 finish (satin).
5. Lockset: Tumbler type.
6. Refill Indicator: Pierced slots at sides or front.

C. Waste Receptacle:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A&J Washroom Accessories, Inc.
 - b. American Specialties, Inc.; ASI Group.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.

- e. Brey-Krause Manufacturing Co.
 - f. GAMCO Specialty Accessories; a division of Bobrick.
 - g. Tubular Specialties Manufacturing, Inc.
- 2. Mounting: Surface mounted.
 - 3. Material and Finish: Stainless steel, No. 4 finish (satin).
 - 4. Liner: Reusable vinyl liner.
 - 5. Lockset: Tumbler type for waste receptacle.

D. Liquid-Soap Dispenser:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A&J Washroom Accessories, Inc.
 - b. American Specialties, Inc.; ASI Group.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.
 - e. Brey-Krause Manufacturing Co.
 - f. GAMCO Specialty Accessories; a division of Bobrick.
 - g. Seachrome Corporation.
 - h. Tubular Specialties Manufacturing, Inc.
- 2. Description: Designed for dispensing antibacterial soap in liquid or lotion form.
- 3. Mounting: Vertically oriented, surface mounted.
- 4. Lockset: Tumbler type.
- 5. Refill Indicator: Window type.

E. Grab Bar:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A&J Washroom Accessories, Inc.
 - b. American Specialties, Inc.; ASI Group.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.
 - e. Brey-Krause Manufacturing Co.
 - f. GAMCO Specialty Accessories; a division of Bobrick.
 - g. Tubular Specialties Manufacturing, Inc.
- 2. Mounting: Flanges with concealed fasteners.
- 3. Material: Stainless steel, 0.05 inch thick.
 - a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
- 4. Outside Diameter: 1-1/2 inches.
- 5. Configuration and Length: As indicated on Drawings.

F. Mirror Unit:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A&J Washroom Accessories, Inc.
 - b. American Specialties, Inc.; ASI Group.
 - c. Bobrick Washroom Equipment, Inc.
 - d. Bradley Corporation.
 - e. Brey-Krause Manufacturing Co.
 - f. GAMCO Specialty Accessories; a division of Bobrick.
 - g. Tubular Specialties Manufacturing, Inc.
2. Frame: Stainless steel, fixed tilt.
 - a. Corners: Manufacturer's standard.
3. Integral Shelf: 5 inches deep.
4. Hangers: Produce rigid, tamper- and theft-resistant installation, using method indicated below.
 - a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
 - b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
5. Size: As indicated on Drawings.

2.3 UNDERLAVATORY GUARDS

A. Underlavatory Guard:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Plumberex Specialty Products, Inc.
 - b. Truebro by IPS Corporation.
2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
3. Material and Finish: Antimicrobial, molded plastic, white.

2.4 FABRICATION

- ### A. Keys:
- Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf, when tested according to ASTM F 446.

END OF SECTION 102800

SECTION 123530 - RESIDENTIAL CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes kitchen cabinets.
- B. Related Requirements:
 - 1. Section 123623.13 "Plastic-Laminate-Clad Countertops."

1.2 DEFINITIONS

- A. MDF: Medium-density fiberboard.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Cabinets.
 - 2. Cabinet hardware.
- B. Shop Drawings: Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, and hardware.
- C. Samples: For cabinet finishes.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For casework.

PART 2 - PRODUCTS

2.1 CABINETS

- A. Basis-of-Design Product: based on standard units by IKEA, provide product indicated on Drawings.
- B. Face Style: Flush overlay.
- C. Cabinet Style: Frameless, Sektion.

- D. Door and Drawer Fronts: Solid-wood stiles and rails, 3/4 inch thick, with 1/2-inch-thick, solid-wood center panels; IKEA Bjorket.
- E. Exposed Cabinet End Finish: IKEA end panel to match units.

2.2 CABINET MATERIALS

- A. Softwood Lumber: Kiln dried to 10 percent moisture content.
- B. Composite Wood Products: Products shall be made using ultra-low-emitting formaldehyde resins as defined in the California Air Resources Board's "Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products" or shall be made with no added formaldehyde.
 - 1. MDF: ANSI A208.2, Grade MD.
- C. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- D. Exposed Materials:
 - 1. Plastic Laminate: Particleboard faced with high-pressure decorative laminate complying with NEMA LD 3, Grade VGS.
 - a. Colors, Textures, and Patterns: As selected by Architect from cabinet manufacturer's full range.

2.3 CABINET HARDWARE

- A. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish as selected by Architect from manufacturer's full range.
- B. Pulls: IKEA pulls.
- C. Hinges: Concealed European-style, self-closing hinges.
- D. Drawer Guides: Epoxy-coated-metal, self-closing drawer guides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05011 or Type B05091.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.
- B. Install cabinets without distortion so doors and drawers fit the openings, are aligned, and are uniformly spaced. Complete installation of hardware and accessories as indicated.
- C. Install cabinets level and plumb to a tolerance of 1/8 inch in 8 feet.
- D. Fasten cabinets to adjacent units and to backing.
 - 1. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head screws sized for not less than 1-1/2-inch penetration into wood framing, blocking, or hanging strips.

3.2 ADJUSTING AND CLEANING

- A. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

END OF SECTION 123530

SECTION 123623.13 - PLASTIC-LAMINATE-CLAD COUNTERTOPS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes plastic-laminate countertops.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.
- C. Samples:
 - 1. Plastic laminates, for each color, pattern, and surface finish.

1.3 INFORMATIONAL SUBMITTALS

- A. Woodwork Quality Standard Compliance Certificates: WI Certified Compliance Program certificates.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Licensee of WI's Certified Compliance Program.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install countertops until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 PLASTIC-LAMINATE COUNTERTOPS

- A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades indicated for construction, installation, and other requirements.

1. Provide labels and certificates from WI certification program indicating that countertops comply with requirements of grades specified.
- B. Grade: Custom.
- C. High-Pressure Decorative Laminate: NEMA LD 3, Grade HGL.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Abet Laminati, Inc.
 - b. Formica Corporation.
 - c. Lamin-Art, Inc.
 - d. Panolam Industries International, Inc.
 - e. Wilsonart International Holdings, Inc.
- D. Colors, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed laminate surfaces complying with the following requirements:
 1. As selected by Architect from manufacturer's full range in the following categories:
 - a. Solid colors, matte finish.
 - b. Patterns, matte finish.
- E. Edge Treatment: Wood as indicated.
- F. Core Material at Sinks: or exterior-grade plywood.
- G. Core Thickness: 3/4 inch.
 1. Build up countertop thickness to 1-1/2 inches at front, back, and ends with additional layers of core material laminated to top.
- H. Paper Backing: Provide paper backing on underside of countertop substrate.

2.2 WOOD MATERIALS

- A. Wood Products: Provide materials that comply with requirements of referenced quality standard unless otherwise indicated.
 1. Wood Moisture Content: 5 to 10 percent.
- B. Composite Wood and Agrifiber Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
 1. Softwood Plywood: DOC PS 1.

2.3 FABRICATION

- A. Fabricate countertops to dimensions, profiles, and details indicated. Provide front and end overhang of 1 inch over base cabinets. Ease edges to radius indicated for the following:
 - 1. Solid-Wood (Lumber) Members: 1/16 inch unless otherwise indicated.
- B. Complete fabrication, including assembly, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- C. Shop cut openings to maximum extent possible to receive appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
 - 1. Seal edges of openings in countertops with a coat of varnish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition countertops to average prevailing humidity conditions in installation areas.

3.2 INSTALLATION

- A. Grade: Install countertops to comply with same grade as item to be installed.
- B. Assemble countertops and complete fabrication at Project site to the extent that it was not completed in the shop.
 - 1. Provide cutouts for appliances, plumbing fixtures, electrical work, and similar items.
 - 2. Seal edges of cutouts by saturating with varnish.
- C. Field Jointing: Prepare edges to be joined in shop so Project-site processing of top and edge surfaces is not required.
 - 1. Secure field joints in plastic-laminate countertops with concealed clamping devices located within 6 inches of front and back edges and at intervals not exceeding 24 inches. Tighten according to manufacturer's written instructions to exert a constant, heavy-clamping pressure at joints.
- D. Install countertops level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
- E. Scribe and cut countertops to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

- F. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
1. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 2. Secure backsplashes to walls with adhesive.
 3. Seal junctures of tops, splashes, and walls with mildew-resistant silicone sealant or another permanently elastic sealing compound recommended by countertop material manufacturer.

END OF SECTION 123623.13

SECTION 220500 - COMMON PLUMBING REQUIREMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to work of this Section.

1.2 SCOPE

- A. Provide labor, material and complete system described and shown. Provide any incidental work not shown or specified which can reasonably be inferred or taken as belonging and necessary.

1.3 DEFINITION

- A. "Contractor" as used in this Division refers to Mechanical Contractor.
- B. "Approval" means approval of Architect.
- C. "Provide" means furnish and install completely.
- D. "Or approved equivalent" implies during substitution request prior to project bid.

1.4 BONDING

- A. Check Division 1 for bonding requirements.

1.5 CODES AND STANDARDS

- A. General

- 1. The plumbing systems shall be installed in accordance with the following codes and standards, but in no instance shall the standards be less than the requirements set forth herein.
 - a. National Electric Codes
 - b. State Department of Public Safety
 - c. Standards of Underwriters' Laboratories (U.L.)
 - d. American Standards Association (ASA)
 - e. Occupational Safety and Health Act (OSHA)
 - f. Local Governing Codes

- g. Compliance with all applicable local, state and federal codes and regulations. Conform with regulations of National Fire Protection Association.
 - h. A.G.A. - American Gas Association
 - i. E.T.L. - Electric Testing Laboratories
- 2. The plumbing system shall be installed in accordance with the 2012 Uniform Plumbing Code as amended by the State of Washington.

1.6 PERMITS

- A. Obtain and pay permits and licenses required.
- B. Pay for and obtain inspections by State and local bodies as required to show compliance therewith
- C. Pay all utility fees.

1.7 MATERIALS

- A. Except as otherwise permitted by specification designation all material shall be new of standard make and where applicable, conform to ASME, NFPA or other requirements and have UL listing. Select equipment to fit space provided.
- B. Pressure vessels to be ASME Code in accord with laws of State of Washington.
- C. Maximum allowable variation from stated capacities, plus 10% to minus zero.

1.8 MATERIAL SUBSTITUTIONS

- A. Use of brand names is for the purpose of description and fixing quality and does not eliminate requirements of meeting specifications.
- B. Requests for review of other brands per INSTRUCTIONS TO BIDDERS.
- C. Submit certification of specification compliance or a statement of variations with request for review or request will not be considered.
- D. Equipment arrangement is based on one specific manufacturer but intended to be typical of the makes approved. Spaces allotted on drawings for equipment are maximum. Equipment requiring more floor space or larger service area will not be acceptable.
- E. "Or approved equivalent" requests for review shall be processed during project bid period prior to bid and contract award. See instructions to bidders in Section 1.
- F. Where the word "only" follows a manufacturer's name and model number, no other product will be considered.

1.9 SUBMITTALS

- A. Product Data: After award of contract and before starting work, submit (7) complete sets of equipment brochures to Architect for review.

1. Format of Submittals

- a. Provide section in submittal for each manufactured item.
 - b. Include name, address, and phone number of each supplier.
 - c. Submittals -
 - 1) Shall be delivered to Architect for approval (15) working days prior to ordering of equipment for processing.
 - 2) Partial submittals will not be accepted and will promptly be returned as disapproved. (in the event that resubmittals are required, unless otherwise noted, resubmit only the required items.) See Section 013300.
 - 3) Bind in 3-ring binder with hard cover.
 - 4) Section and tab each portion of submittal data corresponding to this Specification
 - a) Label each item to correspond with specifications i.e., 22 1117
 - b) Label each item to correspond with contract documents i.e., PEX Piping
 - 5) Submit Manufacturer's catalog data for each manufactured item.
 - 6) Include and underline/highlight pertinent dimensional and rating data, manufacturer, model number, fixture, figure number relating to specific item.
 - 7) Include and underline information showing performance compliance, i.e., capacity, etc.
2. Review is for general compliance with contract documents and to demonstrate Contractor understands design concept. Review does not waive or supersede any requirements of contract documents. No responsibility is assumed for correctness of dimensions, details, or electrical characteristics.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 REQUIRED WORK

- A. Contractor is responsible for location and size of framed openings provided by General Contractor.
- B. Contractor is responsible for sleeves, inserts, etc.

3.2 WORKMANSHIP

- A. Run piping parallel to building, keep as inconspicuous as possible, and grade evenly. Set equipment plumb and true with easy access to maintenance. Off-set piping as required to provide proper and necessary clearance.
- B. Provide adequate clearances for repair and service of mechanical equipment.

3.3 CLEANING UP

- A. Keep premises free from waste material and rubbish and at completion of work remove all rubbish and surplus material, leaving job "broom clean".

3.4 CHANGE ORDERS

- A. Should changes be authorized which in the opinion of Contractor requires additional payment, do not start work until receiving written notice from Architect.

3.5 GUARANTEE

- A. Guarantee equipment and installation, per Division 1 General Requirements. Include written guarantee of compliance stating repairs and replacement of defective equipment and workmanship will be corrected at no expense to Owner.

3.6 TEMPORARY SERVICES

- A. Temporary water and sanitary services by General Contractor.

3.7 EXAMINATION OF DRAWINGS, SPECIFICATIONS AND SITE

- A. At the time of examining the drawings, specifications and site and prior to submitting a bid, the Contractor shall make certain he understands all requirements thoroughly.
- B. If, in the opinion of the Contractor, there are omissions or conflicts in drawings or specifications, the Contractor shall clarify those points with the Architect before submitting the bid.
- C. The omission of the expressed reference to any item of labor or material necessary for the proper execution of the work, in accordance with present day practice, shall not relieve the Contractor from furnishing and installing same.
- D. Drawings are diagrammatic and do not show all offsets, bends, elbows, etc., which may be required for proper installation of work. Such work shall be verified by Contractor at building site. Provide additional bends, offsets as required by riser and main locations, or other conditions, to complete work at no additional cost. Right is reserved to make reasonable changes in outlet locations prior to roughing-in at no additional cost.

- E. Drawings and specifications are complementary and what is called for by one shall be as binding as if called for by both. Items indicated are not necessarily included in Specifications.

3.8 SITE CONDITIONS

- A. Information on drawings relative to existing conditions is approximate. During progress of construction, deviations found necessary to conform to actual conditions shall be reported to Architect for determination of procedure to be followed. Contractor is responsible for any damage caused to existing systems. Promptly notify Architect if utilities are found which are not indicated.
- B. Verify all dimensions, lines and levels at site of all work specified herein. All inverts, slopes and elevations shall be established by instrument, working from established datum. Provide elevation markers and lines for Architect's use in determining that slopes and elevations are in accordance with contract requirements.

3.9 COORDINATION

- A. Study Architectural, Structural and Electrical Drawings to the end that there is no conflict between Mechanical work and work of other trades. Verify exact distances and available space to provide equipment consistent with room allocated.
- B. Because of limited space and multiplicity of services, it is mandatory that strict coordination be maintained by Contractor between the Plumber, Sheet Metal Contractor, Heating Contractor, and Electrician, to provide optimum use of room available.
- C. Coordinate with General Contractor to provide Construction Schedule for Owner approval.

3.10 SUPERVISION

- A. Maintain qualified supervisory personnel on job to coordinate work and space utilization with other trades involved. Supervisor must be completely familiar with operations and requirements of equipment being installed and be responsible for job during entire construction period. Prior to request for final inspection, be certain that equipment and controls are functioning properly.
- B. Supervisor shall answer all service calls and complaints by the Owner for the first thirty days of system operation. Provide Owner with necessary names and phone numbers.
- C. Mechanical drawings and specifications are arranged for convenience only and do not necessarily determine which trades perform various portions of work.
- D. Before shutdown of any utility service for new connections, coordinate with and notify Owner, City and utility.

3.11 SAFETY

- A. In accordance with generally accepted construction practices, Contractor is solely and completely responsible for conditions of job site, including safety of persons and property during performance of work. This requirement applies continuously and is not limited to normal working hours.
- B. Compliance with Federal Department of labor Occupational Safety and Health Administration Standards, latest Edition, will be responsibility of Contractor. Equipment, service platforms, belt guards, etc., to meet OSHA requirements.
- C. Engineer's construction review is for determining compliance with technical provisions of contract documents and is in no way intended to include review of Contractor's safety measures in, on, or near Construction Site. See Architectural General Conditions.

3.12 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

- A. Provide 3 copies for approval in 3-ring hard cover notebook prior to acceptance of installation. Section and tab each portion to correspond to this Specification:
 - 1. Certificates.
 - 2. As-Built Drawings.
 - 3. A brief, type-written description of system and how it functions.
 - 4. Manufacturer's literature for equipment. Complete sets of manufacturer's instructions for operation and maintenance of mechanical equipment, including replacement parts lists, wiring diagrams, and literature, bound in 3-ring notebooks. Provide suppliers directory with subcontractors and suppliers names, addresses and telephone numbers.
 - 5. Instruct Owner's representative in operating system and on each item of equipment and its maintenance.

3.13 AS-BUILT DRAWINGS

- A. Record changes in concealed piping runs, equipment locations or other pertinent information on a set of drawings. Locate underground lines by dimensions from building lines. At close of job, transfer changes to clean set of black lines and turn over to Architect.

3.14 EQUIPMENT PROTECTION

- A. General: Keep all openings closed with plugs or caps to prevent entrance of foreign matter. Protect all piping, fixtures, equipment against dirt, water, chemical, or mechanical damage, both before and after installation. Temporary cap all piping at the end of each work day. Provide caps on all piping when rough-in is complete. Do not remove until finished. Any equipment or apparatus damaged prior to final acceptance shall be restored to original condition or replaced at no additional cost.
- B. Finish: Protect all equipment and materials until in service. Any visible rust or corrosion shall be removed as directed prior to installation.

- C. Store in clean dry area. Leave in shipping container or provide plastic sheet to entirely cover. Do not allow to sit on concrete or grade. Provide 2 x 4's or plastic sheet for equipment and fixtures. Provide 2 x 4's to place all piping on. Wrap with plastic sheet. Failure to comply with above will result in rejection and removal of equipment, fixtures and piping.

3.15 CLEANING

- A. Thoroughly flush out new piping
- B. Remove tags and shipping labels from fixtures and appurtenances. Thoroughly clean fixtures with approved domestic non-abrasive cleaner.

3.16 LUBRICATION

- A. Lubricate equipment properly before being put into service.

3.17 PAINTING

- A. Materials shall comply with Section 099000.
- B. Surfaces shall be prepared and paint applied in accordance with Section 099000, Painting.
- C. Items Painted:
- D. Miscellaneous Metal: Apply one coat of primer followed by one coat of rust-resisting enamel to any uncoated (bare) metal and to all surfaces where factory applied finish is broken including threads of galvanized pipe, steel hangers, rods, anchors, bases, supports, and equipment.

3.18 ELECTRIC CONNECTIONS

- A. Electric Contractor runs wiring, provides and installs disconnect switches, and makes line voltage connections to equipment furnished under this Contract unless noted under Specific items.
- B. After electrical connections are complete, cooperate with Electrical Contractor to verify correct rotations.

3.19 ELECTRICAL CHARACTERISTICS

- A. Conform to voltage and current limitations shown on electrical plans. Should equipment furnished and approved under these specifications require power in excess of that required by the specified equipment, Electrical Contractor will furnish excess power at expense of this Contractor.

3.20 EXCAVATION AND BACKFILL

- A. General: Perform all necessary excavation and backfill required for the installation of mechanical work. Any piping or other work damaged by the Contractor's operations shall be repaired at Contractor's expense.
- B. Water: Keep all excavations free of standing water. Excavations damaged or softened by water or frost shall be re-excavated and filled back to original level with crushed rock or other approved material by the Contractor at his own expense.
- C. Test: During the progress of the work for compacted fill, the Owner reserves the right to request compaction tests made under the direction of a testing laboratory.
- D. Trench Excavation: Excavation trenches to the necessary depth and width, removing rocks, unstable soil (silt, peat, etc.) roots and stumps. Width of trench shall be adequate for proper installation of piping or conduit.
- E. Foundations and Bedding:
 - 1. Foundation Preparation: Proper preparation of foundation, placement of foundation material where required and placement of bedding material shall precede the installation of the pipe. This shall include necessary leveling of the native trench bottom or the top of the foundation material as well as placement and compaction of required bedding material to a uniform grade so that the entire length of pipe will rest firmly on a well compacted material, so the backfill material around the pipe will be placed in a manner to meet requirements specified hereinafter.
 - 2. Where unauthorized excavation has been made below the established grade, the Contractor shall provide, place and compact suitable bedding material to the proper grade elevation at his own expense.
- F. Backfilling: Following installation and successful completion of required test, piping shall be backfilled in lifts. Backfill material shall be placed and compacted in lifts not to exceed 6" in depth to a height of 1' above the top of the pipe. The backfill material shall be placed to obtain contact with the entire periphery of the pipe, without disturbing or displacing the pipe.
- G. Compaction of Trench Backfill: Compaction of trench backfill material is required. One of the following methods or combination thereof shall be used: (1) Mechanical tamper (2) vibratory compactor or (3) other approved methods appropriate to the conditions encountered. The Engineer shall have the right to change methods and limits to better accommodate field conditions. Compaction shall be sufficient to attain 95% of maximum density at optimum moisture content unless noted otherwise on the Drawings or elsewhere in the Specifications. Water "puddling" or "washing" is prohibited.
- H. Foundation Material: Where native material has been removed, necessary foundation material consisting of 3/4" minus crushed rock or fill sand shall be placed and compacted to form a base of the replacement of the required thickness of bedding material.

- I. Bedding: All site piping shall be full bedded on sand or crushed rock. A minimum 4-inch deep layer of sand or crushed rock shall be placed on the leveled trench bottom for this purpose. The bedding shall be removed to the necessary depth of piping bells and couplings to maintain contact of the pipe on the bedding for its entire length. Additional bedding shall be provided in excessively wet, unstable or solid rock trench bottom conditions as required to provide a firm foundation.
- J. Backfill Material: Backfill material shall 3/4" minus crushed rock or sand. Backfill shall be placed and compacted in layers not to exceed 12" in depth.

3.21 CUTTING AND PATCHING

- A. When masonry construction must be penetrated, furnish and install a Schedule 40 steel pipe sleeve in opening and grout in place in a neat manner. Leave grout surface to match existing finish.
- B. Prior to cutting any existing work, locate all concealed utilities to eliminate any possible service interruption or damage.
- C. Provide information to General Contractor as to where finished surfaces must be cut and restored to original conditions.

3.22 TESTS

- A. Testing Equipment: Provide all necessary pumps, gauges, connections and similar items required to perform tests.
- B. General:
 - 1. Test all piping prior to concealment, backfilling, insulation being applied, and connection to equipment, fixtures or specialties.
 - 2. All tests on below grade lines shall be continued until backfill on such lines is completed to disclose any damage caused by backfilling.
 - 3. Leaks: Repair all leaks and re-test until stipulated results are achieved.
 - 4. Notification: Advise the Architect 48 hours in advance of each test.
 - 5. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.
- C. Requirements:
 - 1. Plumbing: Fill waste and vent pipe with water and test for 2 hours. Prove tight under a minimum head of 10 feet of water.
 - 2. Domestic Cold and Hot Water Systems: Test hydrostatically at 1-1/2 times working pressure, but not less than 125 psi for 4 hours.
 - 3. Repair leaks and retest until leaks are eliminated.

3.23 BENEFICIAL USE

- A. When Contractor determines work is substantially complete and ready for beneficial use, request inspection to establish date of substantial completion in accordance with Division 1.

3.24 SITE OBSERVATIONS AND CLARIFICATIONS

- A. Engineer is responsible to make site observations during construction. These observations can be scheduled to coincide with site clarification requests. Engineer (Engineering Office) is not responsible for providing field supervision. Clarification requests shall be written and accompanied by a drawing denoting request. The Engineer at his discretion can charge the Contractor for additional site visits requested by Contractor.

3.25 START-UP AND SUBSTANTIAL COMPLETION INSPECTION

- A. Prior to substantial completion inspection, provide start-up, test and adjustment of each item of mechanical equipment by qualified field personnel. Coordinate controls furnished with equipment and system operating controls. Calibrate and integrate to operate as specified. Systems balancing can be uncompleted at this time.
- B. Coordinate with General Contractor to establish a substantial completion date. General Contractor to notify Architect of same.

3.26 FINAL INSPECTION

- A. Final Inspection shall take place after all Substantial Completion Inspection "punch list" items have been completed and the enclosed request form and completion documents have been received by the Architect. Review of "As Built Drawings", Balancing Logs and "O & M" manuals will be done at this time.
- B. The Engineer is responsible for making said inspection. Any additional inspections will be at Contractor's cost deducted from retainage.

3.27 REQUEST FOR FINAL INSPECTION

The undersigned formally requests final inspection on the following project by the Engineer of record. The requesting Contractor certifies that all work designed by Engineer has been completed according to the project contract documents, and that all systems are functional and ready for final inspection at this time. It is further certified that completion documents (complete operating and maintenance manuals, as built drawings, balancing reports and all certificates) have been delivered to the Engineer of record a minimum of three working days prior to requested date of final inspection. Engineer will confirm date of final inspection as soon as the submitted documents have been reviewed and found to be acceptable.

Contractor agrees if Engineer attempts to perform final inspection and project is incomplete or not completely functional, contractor will pay Engineer for subsequent follow up inspection. Cost of

performing additional final inspection for this project is estimated at \$1,000.00.

Job Name: _____

Owner: _____

Building Location: _____

Date Inspection Requested: _____ Time: _____

Date Completion Documents Delivered: _____ Via: _____

REQUESTING CONTRACTOR:

Telephone: (_____) _____ Fax: (_____) _____

Firm Name: _____

Address: _____

Project Foreman: _____

Signature of Officer of Firm: _____

Title: _____

Date: _____

Return To:

Paraclete P.S., Inc.
7510 N.E. Vancouver Mall Drive #100
Vancouver, Washington 98662
360/254-9234 Phone
360/254-7885 Fax

Original signed document must be mailed or delivered.

3.28 REQUEST FOR INFORMATION

- A. We recommend submitting questions prior to the deadline for the last addendum during the bid time in order that proper, formal response can be made. The last addendum is usually issued 7 days prior to bid.

3.29 CERTIFICATES

- A. Furnish certificates of compliance with Plumbing Code signed by Chief Inspector of Code Body, covering plumbing, roughing-in, and finish.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

B. Copy of Chlorination Report

END OF SECTION 15024-22 0500

SECTION 220523 - VALVES

PART 1 - GENERAL

1.1 SCOPE

- A. Provide valves as described in Contract Documents.
- B. Valve rating shall exceed respective system operating pressures. All valves shall be line size unless otherwise indicated. Selection of valve trim materials shall be as recommended by manufacturer for temperature and pressure applicable.

1.2 SUBMITTALS

- A. Required for all valve types used.

PART 2 - PRODUCTS

2.1 MATERIALS AND MANUFACTURERS

- A. Manufacturers: Jenkins Bros.; Kennedy Valve Mfg. Co.; Stockham Valves & Fittings, Inc.; Crane Co.; Hammond; Walworth Co.; The Wm. Powell Co.; Milwaukie, Lunkenheimer Co.; Nibco; Vic, Apollo; FNW, or special as specified.
- B. Ball Valves: To be used up to 3" size on water piping systems 150 psig or less. Crane Co.; Milwaukie; Hammond or Jenkins.

2.2 VALVES SCHEDULE

- A. Plumbing:
 - 1. Swing Check Valves: Water.
 - a. 3/8" - 3": 1222; solder end; bronze.
 - b. 1/4" - 3": 92A; threaded; bronze.
 - c. 2-1/2" & larger: 624; flanged: I.B.B.M.
 - 2. Ball Valves: Water.
 - a. Milwaukie BA-200 (threaded), BA-250 (soldered) or Jenkins 900T; 1/2" through 2".
 - 3. Hose End Ball Valve with cap and chain:

- a. Milwaukie BA-150H.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install valves with stems in vertical position with handles upward if possible. Valves may be rotated with stems in horizontal position. In no case are valves to be installed with handles down or with stems in less than horizontal position.

3.2 ADJUSTMENT

- A. Adjust packing for free operation of handles and leak free operation. Insure that handles have adequate clearance for proper operation.
- B. Operate each valve checking for tight shut-off and full flow. Inspect operation to insure that stem is not bent. Replace any bent stems, or damaged valves.

END OF SECTION 220523

SECTION 220529 - PIPE SUPPORTS

PART 1 - GENERAL

1.1 SCOPE

- A. Provide labor, material and complete system described and shown. Provide any incidental work not shown or specified which can reasonably be inferred or taken as belonging and necessary.

PART 2 - PRODUCTS

2.1 PIPE SUPPORTS

- A. Approved Manufacturers: Anvil Corp. (ITT), Michigan, Fee & Mason MFG. Co. (ATO, Inc.), Carpenter Technology Corp., Pipe Shields, Inc., Tolco or approved equal.
- B. Pipe Covering Protection: Provide pipe cover protection at hangers on all continuous vapor barrier insulated piping. Pipe support sleeves to be 20 gauge sheet metal, 6 inches long roll formed to fit round insulation shape.
- C. Upper Attachments:
 - 1. Provide necessary unistrut or angles. Secure to Purlins or Joists.
 - a. Unistrut - threaded rod terminate with washer and 2 nuts.
 - b. Angles - "C" clamps for threaded rods with retaining clip.
- D. Lower Attachments: Shall be as follows, unless otherwise indicated
 - 1. Hangers for water tubing: Fig. 65 Anvil or equal clevis type, 1/2" through 2".
 - 2. Uninsulated Copper Tubing all sizes: Fig. CT-65 copper-plated clevis.
 - 3. Cast iron all sizes: Fig. 590 clevis.
 - 4. UNI-STRUT Clamps:
 - a. PEX: TouchDown II Strut Clamp by Sioux or approved equivalent.
 - b. ABS/PVC: Unistrut Clamp-Wrap pipe with (2) layers of Scotch 33 Tape.
 - 5. On all insulated piping with continuous vapor barrier (cold water and storm drain) provide insulation protection shield fig. 167 at all hanger locations. Increase hanger size to allow for continuous insulation.

PART 3 - EXECUTION

3.1 PIPE SUPPORTS

A. Hanger Rods - Size & Spacing Schedule - Maximum Hanger Water and Waste.

PIPE	WEIGHT PER FOOT (WITH H ₂ O)	MINIMUM HANGER ROD SIZE	PLASTIC DWV ABS or PVC	PEX PIPING
1/2"	1.0	1/4"	2'-8"	
3/4"	1.4	1/4"	2'-8"	
1"	2.1	1/4"	2'-8"	
1-1/4"	2.9	3/8"	4'	2'-8"
1-1/2"	3.6	3/8"	4'	2'-8"
2"	5.2	3/8"	4'	2'-8"
2-1/2"	7.9	1/2"	4'	2'-8"
3"	10.8	1/2"	4'	2'-8"

END OF SECTION 220529

SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Provide labeling of piping and equipment as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for pipe markers.

PART 2 - PRODUCTS

2.1 IDENTIFICATION

- A. Piping Markers: Pipes shall be labeled with "glue-on" labels manufactured by W.H. Brady Company, or Seton. For pipe covering sizes up to and including 1-inch outside diameter, select labels with 1/2-inch letters. For sizes from 1-1/4 to 2-inch outside diameter, 3/4-inch letters; above 2-inch outside diameter, 2-inch letters. The pipe markers shall be identified and color coded as follows:

1. Color

<u>Service</u>	<u>Pipe Marker</u>	<u>Background</u>
Cold Water	"Domestic Cold Water Supply"	Green
Hot Water	"Domestic Hot Water Supply"	Yellow

PART 3 - EXECUTION

3.1 LOCATORS

- A. Provide valve locators to walls and ceilings wherever valves are concealed.

1. Wall and Hard Ceilings - 1/8" round color dot on access door
2. Lay-In Tile Ceiling - 1/8" round color stick pins in tile below valve.
3. Colors shall be as follows:

Domestic CW	Green
Domestic HW	Yellow

3.2 PIPE MARKERS

- A. Provide with flow arrows indicating flow direction. Pipe markers to be placed on each side of wall penetrations and a maximum of 20 feet on center. Pipe markers to be placed on pipe risers from equipment.

END OF SECTION 220553

SECTION 220700 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 Provide insulation of equipment, fixtures, and piping as described in Contract Documents.

1.2 SUBMITTALS

A. Required for all items.

PART 2 - PRODUCTS

2.1 FLAME AND SMOKE RATING

- A. Descriptions: All insulation material hazard ratings, as tested by procedures of ASTM E-84, NFPA 255 and U.L. 723, not to exceed a flame spread index of 25 and a smoke developed index of 50. PVC fitting covers and accessories such as adhesives, cement, etc., provided with a component rating as listed above. All products and their shipping cartons provided with identification of the flame spread index and smoke developed index.
- B. Data Required: Catalog data to show compliance with flame and smoke rating.
- C. Manufacturers: Certainteed, Knauf, Manville, Schuler and Owens-Corning.

2.2 PIPE INSULATION

A. Description: One piece, multipurpose preformed glass fiber pipe insulation with vapor barrier jacket, k of 0.25 at 75°F mean temperature difference similar to Schuler "Micro-Lok AP" jacket.

B. Above Ground Hot Water:

<u>Pipe Size</u>	<u>Temperature</u>	<u>Insulation Thickness</u>
less than 1"	105° F - 1400F	1"

C. Above Ground Cold Water and Storm Drain:

<u>Pipe Size</u>	<u>Temperature</u>	<u>Insulation Thickness</u>
less than 1"	400 - 600 F	1/2"
1" - 1-1/2"	400 - 600 F	1/2"

D. Below ground cold water: Not required.

E. Alternate Hot or Cold Water and Storm Drain Insulation:

1. Flexible, elastomeric, expanded closed cell insulation, thickness 1/2". Material meeting flame spread of 25 or less and smoke developed of 100 or less as tested by ASTM E 84-81a. Provide in tubular or slit tube form. Thermal conductivity of 0.27 at 75°F mean temperature as tested by ASTM C177 or C518. Water vapor permeability 0.17 (ASTM E96, procedure B). Maximum water absorption - 3% by weight.
2. Contact Joint Sealer: Armaflex 520, BFG construction adhesive No. 105, Therma-Cel 950, NOMACO or IMCOA equivalent.
3. Manufacturer: Armaflex, Rubatex, CSG Ultrafoam, Therma-Cel, IMCOA or NOMACO.
4. Thickness per 2.2B and C above.

2.3 FITTING, FLANGE, VALVE, AND PIPE TERMINATION INSULATION

- A. Description: Preformed PVC insulated fitting cover similar to Manville Zeston 2000 to be secured over fittings insulated per above for various services.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Install in accordance with manufacturer's recommendations. Seal all insulation to maintain continuous vapor barrier on domestic cold water piping. Insulation continuous through hangers, floors, walls, etc. Provide 6 inches long 22 gauge steel sleeve at each pipe support and penetration.
- B. Insulate valve bodies, bonnets, and grooved pipe fittings utilizing Zeston preformed pipe covering. Insulate valve bonnets and unions in cold water piping with material of same thickness as adjacent pipe covering. Use insulating cement and field-applied fire retardant jacket, or large size pipe covering as required for neat appearing installation.
- C. Piping to be insulated to fixture stop or equipment stop.
- D. On handicap lavatory exposed water and waste piping, provide "Lav Guard" or "Trap Wrap" pre-fit insulation. Color to be ivory or taupe.
- E. Flexible, elastomeric, expanded closed cell insulation
- F. Slip insulation on piping before piping and fittings are assembled keeping slitting of insulation to a minimum.
- G. Longitudinal joints, as necessary, to be at top of pipe.
- H. Seal butt joints and longitudinal "slits" with joint sealer.
- I. Wrap valve bodies and fittings with insulation and seal with adhesive.

END OF SECTION 220700

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

SECTION 221117 - PEX PIPING

PART 1 - GENERAL

1.1 STANDARDS

- A. ANSI/AGA LC-1

1.2 SUBMITTALS

- A. Required for all items.

PART 2 - PRODUCTS

2.1 SYSTEM COMPONENTS:

- A. Tubing: Cross-link polyethylene listed to ASTM F876 and F877 and certified to NSF Standards 14 and 61. Test to pressure 100 psi.
- B. Appurtenances: Manifold, fittings, adaptors, plugs, bend supports, fasteners, stop valves, fittings, firestop sealant and tools.
- C. Color Code
 - 1. Cold Water Blue or White
 - 2. Hot Water Red
- D. Manufacturer: Wirsbo, Vanguard, Zurn Pex.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. System to be installed in accord with the Uniform Plumbing Code as amended by the State of Washington, latest edition and manufacturer's installation instructions.
- B. Piping may be used for, 1-1/2" and less.

3.2 TESTING

- A. Test complete system at 100 psi.

3.3 PEX PIPING

- A. PEX piping must be insulated per State of Washington Energy Code.

END OF SECTION 221117

SECTION 221119 - DOMESTIC WATER SPECIALTIES

PART 1 - GENERAL

1.1 SCOPE

- A. Provide domestic water specialties and their installation as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all items.

PART 2 - PRODUCTS

2.1 ACCESS PANELS

- A. Fire rated, all surfaces; U.L. Listed 16 gauge flanged steel frame, 20 gauge steel door with concealed pin hinge and screw driver security latch/lock system. Prime coat.
- B. Sizes
 - 1. Trap primer, valve, etc, access - 12 x 12.
 - 2. Equipment access through walls and ceilings - 24 x 24.

2.2 WATER FLEXIBLE CONNECTOR

- A. Brasscraft "Speedi Plumb Plus" 3/4" and less, Falcon Stainless, Inc., 1" and larger only, or approved equivalent. Must be line size of cold and hot water to and from heater.

PART 3 - EXECUTION

- A. Provide and install water flexible connector at cold and hot water inlet to water heater.
- B. Provide and install access panels where indicated on drawings.

END OF SECTION 221119

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install waste and vent piping systems within buildings to termination on site as indicated on Contract Drawings.
- B. Perform excavation and backfill. See Section 220500

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 STANDARD PIPE AND FITTING CLASSES

- A. General: Pipe classes listed in Pipe and Fitting Schedule are to be used. Standards are to be latest revision.
- B. Pipe and Fittings:
 - 1. Class M:
 - a. ABS-DWV:
 - 1) Pipe & Fittings: ASTM F628.
 - 2) Solvent Cement: ASTM D2235-93a.
 - OR
 - b. PVC-DWV:
 - 1) Pipe & Fittings: ASTM D2665-94, D2122-90
 - 2) ASTM D3311-92
 - 3) Solvent Cement: ASTM D2564-80
 - 4) All the above to be listed in the Latest Edition of the U.P.C. and marked with IAPMO Label.

2.2 PIPE JOINTS

- A. General: Pipe and fittings shall be mounted using methods and materials recommended by manufacturer, in conformance with standard practice and applicable Codes. Cleaning, cutting, reaming, grooving, etc., shall be done with proper tools and equipment. Hacksaw pipe cutting prohibited.
- B. ABS System Joints:
 - 1. Solvent cement, gasket-type or special procedures per manufacturer's recommendations and IAPMO Standard IS 11-87 as indicated in the latest edition of the Uniform Plumbing Code.
- C. PVC-DWV Joints:
 - 1. Solvent cement, gasket-type or special procedures per manufacturer's recommendations and IAPMO Standard IS9-95 as indicated in the latest edition of the Uniform Plumbing Code.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Piping installed as indicated, direct as possible without unnecessary offsets or fittings and parallel with building lines. Vertical risers plumb.
- B. Slopes: Horizontal piping shall slope uniformly without sags or humps to provide for complete drainage of systems. Drainage piping shall slope at 1/4 inch per foot minimum.

END OF SECTION 221316

SECTION 223300 - ELECTRIC WATER HEATERS

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install electric water heaters as specified in Contract Documents.

1.2 SUBMITTALS

- A. Required for all products specified and/or scheduled on drawings.

PART 2 - PRODUCTS

2.1 ELECTRIC WATER HEATER

- A. General: Provide electric water heater with glass lined tank, glass fiber insulation, heavy gauge steel jacket, 150 psig working pressure, UL listed, magnesium anode, with thermostat stepped electric heating, double pole manual reset high limit immersed thermostat.
- B. See plans for capacity.
- C. Manufacturers: Lochinvar, Rheem, Rudd, A.O. Smith, Bradford White and State.
- D. Heater labeled to meet ASHRAE 90A standard, and meet Energy Efficiency factor of 0.95.

2.2 SEISMIC BRACING FOR WATER HEATER

- A. As manufactured by Spacemaker Model No. E-25 for 55 gallon tanks and below. Use E-50 for tanks above 55 gallon to 100 gallon tanks.

2.3 ACCESSORIES

- A. Thermal Expansion Absorbers
 - 1. Bladder type for use with potable water systems.
 - 2. Acceptable Products -
 - a. Therm-X-Trol ST-5 by Amtrol

PART 3 - EXECUTION

- A. Electric Water Heaters on Concrete Floors: Provide wood or steel stand with minimum of R-10 insulation between floor and bottom of heater.
- B. Pipe PTRV discharge to termination as indicated on drawings.
- C. Anchor water heater to wall using two (2) anchor straps. Fasten anchors in accordance with manufacturers recommendations and as construction dictates.
- D. Provide and install water flexible connector at cold and hot water inlet to heater.
- E. Install thermal expansion absorber per manufacturer's recommendations and drawing details.

END OF SECTION 223300

SECTION 224000 - PLUMBING FIXTURES AND APPURTENANCES

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install plumbing fixtures specified and/or scheduled on drawings.

1.2 SUBMITTALS

- A. Required for all products.

1.3 FIXTURE MANUFACTURERS

- A. Drainage Products -

1. Smith
2. Watts
3. Zurn
4. Prior approved equivalents. See Plumbing Schedule.

- B. Vitreous China -

1. American Standard
2. Kohler
3. Zurn
4. Crane
5. Prior approved equivalents. See Plumbing Schedule.

- C. Faucets -

1. Delta
2. Prior approved equivalents. See Plumbing Schedule.

- D. Stainless Steel Fixtures -

1. Just
2. Elkay
3. Prior approved equivalents. See Plumbing Schedule.

1.4 FIXTURE TRIM & APPURTENANCES

- A. Furnish and install plumbing fixtures with necessary trim, stops and traps.
 1. Furnish and install stops with escutcheons at sink, lavatories, water closets.

- a. Stops: 1/4 turn ball valve by BrassCraft, McGuire, or Zurn. Connect with flexible chrome plated tube or NSF flexible connector.
- 2. Aerators completely vandal proof. Trim with replaceable and interchangeable assemblies. Hot and cold water faucet to open towards center.

1.5 FIXTURE SUPPORTS AND ANCHORS - LAVATORIES

- A. All wall supports must be securely anchored to studs per manufacturers recommendations to make fixture rigid.

1.6 PIPING: See Sections 22 1117, 22 1316 - PIPE AND FITTINGS

- A. Waste Below Grade: Class: M
- B. Waste Above Grade: Class: M
- C. Vent Below Grade: Class: M
- D. Vent Piping Above Grade: Class M
- E. Potable Water Above Grade: PEX
- F. Potable Water Below Grade: PEX

1.7 CHLORINATION

- A. General: Upon completion of all tests and necessary replacements, all new domestic water piping shall be disinfected. Chlorination shall be accomplished by personnel in employ of firm licensed in this specialized type of work. After work has been accomplished, provide the Owner and Architect a statement from the laboratory indicating the water is suitable for human consumption. Engineered Control Products Inc.
- B. Method: The system shall be charged with a chlorine solutions of at least 50 PPM residual chlorine. The solution shall be distributed evenly throughout the system. The strong chlorine solution shall remain in the system for a minimum of 24 hours. The strength of the solution shall be confirmed at over 10 PPM at the end of the 24 hours period. Alternate method per UPC allows use of solution at 200 ppm for 3 hours.
- C. Samples: Bacteriological samples shall be submitted to a certified laboratory who shall certify that the water is suitable for drinking.

1.8 CLEANOUTS

- A. General: Provide Jay R. Smith, Watts, or Zurn, cleanouts where indicated, and required by Code. Same size as main with maximum size of 4".

1. In floors, nikalloy finish, Smith 4023.
2. In walls of finished space, Smith 4472.
3. In exterior areas, Smith 4243.
4. Provide tiling flanges in tile floors.
5. Secure cleanout cover with stainless steel flat head screws.

1.9 TRAP PRIMERS

- A. Automatic Trap Primer Unit: Provide entire trap primer units complete as indicted with piping, valves, all equipment components and appurtenances.
- B. In-Line Type: Automatic trap primer valve Complying with ASTM-D-1784, NSF approved. Smith 2699-1 with integral backcheck assembly, P.P.P Model P-1 & P-2.

1.10 TRAPS

- A. General: Provide traps on all fixtures connected to soil systems except for fixtures having integral traps and arrange so discharge from a fixture will not pass through more than one trap before reaching sewer. All traps shall have seal of not less than 2" nor more than 4".
- B. Exposed Traps: White DWV PVC assemblies.

1.11 HOSE BIBBS

- A. General: Provide Chicago, Jay R. Smith, Wade or Zurn hose bibbs with brass castings and dull bronze face boxes. See schedule on drawings.

1.12 PLUMBING FIXTURES INSTALLATION

- A. General: Provide new plumbing fixtures of type specified on drawings and quality shown.
 1. Fixtures: Complete with fittings, supports, fastening devices, faucets, valves, traps and appurtenances required.
 2. Vitreous Ware: Non-absorbent china of even color or unmarked.
 3. Porcelain Lined Ware: constructed of smooth, sound iron castings, properly finished and provided with first quality high temperature enamel.
 4. Warranty: All fixtures warranted not to craze, color or scale.
 5. Escutcheons: Brass chrome plated.
 6. Fixtures set connected to soil, waste, vent and water supplies in neat, finished and uniform manner.
 7. Connections: Equal height, plumb and set at right angles to floor, wall or both unless otherwise required or specified.
 8. Fixture Locations: As shown on Architectural Drawings.
 9. For counter mounted fixtures provide white silicone caulking compound, Dow Corning #780 or G.E. Construction Sealant on counter top before inserting lavatory to ensure proper seal. Caulk under rim of fixture before inserting into counter.

10. After fixtures are set in place and secured to walls, caulk all around between fixtures and wall with white silicone caulking compound, Dow Corning #780, G.E. Construction Sealant, or approved substitute.
11. Seal faucets to lavatory with plumbers putty under faucet.
12. All gaskets and compression rings to be neoprene rubber. Wax is not allowed.
13. Install shutoff and union upstream of trap primer. Adjust trap primer for proper flow to maintain trap seal.
14. Secure water closet to flange with brass toilet bolts, brass plated toilet bolts not allowed.
15. Handle on flush tank ADA water closet to be located on wide side of stall.

1.13 PIPING INSTALLATION

- A. Carry vent pipes 12" minimum above roof. Coordinate with Metal Roofing Contractor for penetration and sealing of vent.
- B. No water piping is to be wired or supported in any other way from waste or vent system. Pitch water lines to low points and provide ball type hose end valve with cap and chain.
- C. Provide and install polished nickel plated split-plate escutcheons of sufficient diameter to cover pipe sleeves where exposed pipes go through walls, floors and ceilings.

END OF SECTION 224000

SECTION 230500 - GENERAL PROVISIONS

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Related Documents: Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to work of this Section.

1.2 SCOPE

- A. Provide labor, material and complete system described and shown. Provide any incidental work not shown or specified which can reasonably be inferred or taken as belonging and necessary.

1.3 DEFINITION

- A. "Contractor" as used in this Division refers to Mechanical Contractor.
- B. "Approval" means approval of Architect.
- C. "Provide" means furnish and install completely.
- D. "Or approved equivalent" implies during substitution request prior to project bid.

1.4 BONDING

- A. Check Division 1 for bonding requirements.

1.5 CODES AND STANDARDS

- A. General - Design Phase

- 1. The heating, ventilating and air conditioning system shall be installed in accordance with the following codes and standards, but in no instance shall the standards be less than the requirements set forth herein.
 - a. National Electric Codes
 - b. State Department of Public Safety
 - c. Standards of Underwriters' Laboratories (U.L.)
 - d. American Standards Association (ASA)
 - e. Occupational Safety and Health Act (OSHA)
 - f. Local Governing Codes

- g. Air Moving and Conditioning Association (AMCA)
- h. American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE)
- i. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
- j. Compliance with all applicable local, state and federal codes and regulations. Conform with regulations of National Fire Protection Association.
- k. A.G.A. - American Gas Association
- l. A.R.I. - Air Conditioning & Refrigeration Institute
- m. E.T.L. - Electric Testing Laboratories

- 2. The HVAC system shall be installed in accordance with the 2012 International Mechanical Code as amended by the State of Washington.

1.6 PERMITS

- A. Obtain and pay permits and licenses required.
- B. Pay for and obtain inspections by State and local bodies as required to show compliance therewith.

1.7 MATERIALS

- A. Except as otherwise permitted by specification designation all material shall be new of standard make and where applicable, conform to ASME, NFPA or other requirements and have UL listing. Select equipment to fit space provided.
- B. Pressure vessels to be ASME Code in accord with laws of State of Washington.
- C. Maximum allowable variation from stated capacities, plus 10% to minus zero.

1.8 MATERIAL SUBSTITUTIONS

- A. Use of brand names is for the purpose of description and fixing quality and does not eliminate requirements of meeting specifications.
- B. Requests for review of other brands per INSTRUCTIONS TO BIDDERS.
- C. Submit certification of specification compliance or a statement of variations with request for review or request will not be considered.
- D. Equipment arrangement is based on one specific manufacturer but intended to be typical of the makes approved. Spaces allotted on drawings for equipment are maximum. Equipment requiring more floor space or larger service area will not be acceptable.
- E. "Or approved equivalent" requests for review shall be processed during project bid per period prior to bid and contract award. See instructions to bidders in Section 1.

- F. Where the word “only” follows a manufacturer's name and model number, no other product will be considered.

1.9 SUBMITTALS

- A. Product Data: After award of contract and before starting work, submit (7) complete sets of equipment brochures to Architect for review.

1. Format of Submittals

- a. Provide section in submittal for each manufactured item.
- b. Include name, address, and phone number of each supplier.
- c. Submittals -
 - 1) Shall be delivered to Architect for approval (15) working days prior to ordering of equipment for processing.
 - 2) Partial submittals will not be accepted and will promptly be returned as disapproved. (in the event that re-submittals are required, unless otherwise noted, resubmit only the required items.) See Section 01300.
 - 3) Bind in 3-ring binder with hard cover
 - 4) Section and tab each portion of submittal data corresponding to this Specification
 - a) Label each item to correspond with specifications i.e., 23 3713
 - b) Label each item to correspond with contract documents i.e., Diffusers
 - 5) Submit Manufacturer's catalog data for each manufactured item
 - 6) Include and underline/highlight pertinent dimensional and rating data, manufacturer, model number, fixture, figure number relating to specific item.
 - 7) Include and underline information showing performance compliance, i.e., cfm, capacity, etc.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 REQUIRED WORK

- A. This Contractor is responsible for proper location, and sizes for framed openings, roof leveling curbs, sleeves, inserts, etc.

3.2 WORKMANSHIP

- A. Run piping parallel to building, keep as inconspicuous as possible, and grade evenly. Set equipment plumb and true with easy access to maintenance. Off-set piping as required to provide proper and necessary clearance.
- B. Provide adequate clearances for repair and service of mechanical equipment.

3.3 CLEANING UP

- A. Keep premises free from waste material and rubbish and at completion of work remove all rubbish and surplus material, leaving job "broom clean".

3.4 CHANGE ORDERS

- A. Should changes be authorized which in the opinion of Contractor requires additional payment, do not start work until receiving written notice from Architect.

3.5 GUARANTEE

- A. Guarantee equipment and installation, per Division 1 General Requirements. Include written guarantee of compliance stating repairs and replacement of defective equipment and workmanship will be corrected at no expense to Owner.

3.6 TEMPORARY SERVICES

- A. Temporary water and sanitary services by General Contractor.

3.7 EXAMINATION OF DRAWINGS, SPECIFICATIONS AND SITE

- A. At the time of examining the drawings, specifications and site and prior to submitting a bid, the Contractor shall make certain he understands all requirements thoroughly.
- B. If, in the opinion of the Contractor, there are omissions or conflicts in drawings or specifications, the Contractor shall clarify those points with the Architect before submitting the bid.
- C. The omission of the expressed reference to any item of labor or material necessary for the proper execution of the work, in accordance with present day practice, shall not relieve the Contractor from furnishing and installing same.
- D. Drawings are diagrammatic and do not show all offsets, bends, elbows, etc., which may be required for proper installation of work. Such work shall be verified by Contractor at building site. Provide additional bends, offsets as required by riser and main locations, or other conditions, to complete work at no additional cost. Right is reserved to make reasonable changes in outlet locations prior to roughing-in at no additional cost.

- E. Drawings and specifications are complementary and what is called for by one shall be as binding as if called for by both. Items indicated are not necessarily included in Specifications.
- F. Coordinate with General Contractor to provide Construction Schedule for Owner approval.

3.8 COORDINATION

- A. Study Architectural, Structural and Electrical Drawings to the end that there is no conflict between Mechanical work and work of other trades. Verify exact distances and available space to provide equipment consistent with room allocated.
- B. Because of limited space and multiplicity of services, it is mandatory that strict coordination be maintained by Contractor between the Plumber, Sheet Metal Contractor, Heating Contractor, Fire Protection Contractor and Electrician, to provide optimum use of room available.
- C. Coordinate with General Contractor to provide Construction Schedule for Owner approval.

3.9 SUPERVISION

- A. Maintain qualified supervisory personnel on job to coordinate work and space utilization with other trades involved. Supervisor must be completely familiar with operations and requirements of equipment being installed and be responsible for job during entire construction period. Prior to request for final inspection, be certain that equipment and controls are functioning properly.
- B. Supervisor shall answer all service calls and complaints by the Owner for the first thirty days of system operation. Provide Owner with necessary names and phone numbers.
- C. Mechanical drawings and specifications are arranged for convenience only and do not necessarily determine which trades perform various portions of work.
- D. Before shutdown of any utility service for new connections, coordinate with and notify Owner, City and utility.

3.10 SAFETY

- A. In accordance with generally accepted construction practices, Contractor is solely and completely responsible for conditions of job site, including safety of persons and property during performance of work. This requirement applies continuously and is not limited to normal working hours.
- B. Compliance with Federal Department of Labor Occupational Safety and Health Administration Standards, latest Edition, will be responsibility of Contractor. Equipment, service platforms, belt guards, etc., to meet OSHA requirements.
- C. Engineer's construction review is for determining compliance with technical provisions of contract documents and is in no way intended to include review of Contractor's safety measures in, on, or near Construction Site. See Architectural General Conditions.3.11

3.11 MAINTENANCE DATA AND OPERATING INSTRUCTIONS

- A. Provide 3 copies for approval in 3-ring hard cover notebook prior to acceptance of installation. Section and tab each portion to correspond to this Specification:
1. Certificates.
 2. System balance logs and drawings.
 3. As-Built Drawings.
 4. A brief, type-written description of system and how it functions.
 5. Manufacturer's literature for equipment. Complete sets of manufacturer's instructions for operation and maintenance of mechanical equipment, including replacement parts lists, wiring diagrams, belt type and size if belt driven, type of bearings on unit and motor, control diagrams and literature, bound in 3-ring notebooks. Provide suppliers directory with subcontractors and suppliers names, addresses and telephone numbers.
 6. Instruct Owner's representative in operating system and on each item of equipment and its maintenance.

3.12 AS-BUILT DRAWINGS

- A. Record changes in concealed piping runs, equipment locations or other pertinent information on a set of drawings. Locate underground lines by dimensions from building lines. At close of job, transfer changes to "clean set" of black lines and turn over to Architect.

3.13 EQUIPMENT PROTECTION

- A. General: Keep all openings closed with plugs or caps to prevent entrance of foreign matter. Protect all piping, ductwork, and equipment against dirt, water, chemical, or mechanical damage, both before and after installation. Temporary cap all piping and ductwork at the end of each work day. Provide caps on all piping and ductwork when rough-in is complete. Do not remove until finish or for temporary heat. Any equipment or apparatus damaged prior to final acceptance shall be restored to original condition or replaced at no additional cost.
- B. Start-up: Equipment shall be adjusted, lubricated, aligned, etc., prior to start-up. Manufacturer shall inspect each piece of equipment prior to start-up.
- C. Finish: Protect all equipment and materials until in service. Any visible rust or corrosion shall be removed as directed prior to installation.
- D. Store in clean dry area. Leave in shipping container or provide plastic sheet to entirely cover. Do not allow to sit on concrete or grade. Provide 2 x 4's or plastic sheet for equipment and fixtures. Provide 2 x 4's to place all piping on. Wrap with plastic sheet. Failure to comply with above will result in rejection and removal of equipment, fixtures and piping.
- E. Return and exhaust air systems shall not be used during construction. All duct rough-in openings into return and exhaust air systems shall be sealed air tight. After installation of flexible duct and grilles, seal grilles air tight. Architect will approve removal of seals when space is clean and ready for air balance. Balancing Contractor will remove seals.

3.14 CLEANING

- A. Replace filters in air moving equipment operating during construction prior to turning job over to Owner.

3.15 LUBRICATION

- A. Lubricate equipment properly before being put into service.

3.16 PAINTING

- A. Materials shall comply with Section 099000.
- B. Surfaces shall be prepared and paint applied in accordance with Section 099000, Painting.
- C. Items Painted:
- D. Miscellaneous Metal: Apply one coat of primer followed by one coat of rust-resisting enamel to any uncoated (bare) metal and to all surfaces where factory applied finish is broken including threads of galvanized pipe, steel hangers, rods, anchors, grilles, bases, supports, and equipment.
- E. Sheet Metal: Apply one coat of zinc chromate to all mechanical sheet metal exposed to weather, except painting is not required on aluminum or stainless steel. Apply one coat of flat black paint to the inside of unlined ducts visible through grilles and registers from finished spaces.

3.17 ELECTRIC CONNECTIONS

- A. Electric Contractor runs wiring, provides and installs disconnect switches, mounts starters and makes line voltage connections to equipment furnished under this Contract unless noted under Specific items. Wiring by Mechanical to conform to Electrical Division wiring methods.
- B. After electrical connections are complete, cooperate with Electrical Contractor to verify correct rotations.

3.18 ELECTRICAL CHARACTERISTICS

- A. Conform to voltage and current limitations shown on electrical plans. Should equipment furnished and approved under these specifications require power in excess of that required by the specified equipment, Electrical Contractor will furnish excess power at expense of Mechanical Contractor.

3.19 TESTS

- A. Testing Equipment: Provide all necessary pumps, gauges, connections and similar items required to perform tests.

B. General:

1. Test ductwork prior to connection to equipment.
2. Leaks: Repair all leaks and re-test until stipulated results are achieved.
3. Notification: Advise the Architect 48 hours in advance of each test.
4. Before operating any equipment or systems, make thorough check to determine that systems have been flushed and cleaned as required and equipment has been properly installed, lubricated and serviced. Check factory instructions to see that installations have been made accordingly and that recommended lubricants have been used.
5. Use particular care in lubricating bearings to avoid damage by over-lubrication and blowing out seals. Check equipment for damage that may have occurred during shipment, after delivery or during installation. Repair damaged equipment as approved or replace with new equipment.
6. After completion of requirements above and immediately before starting tests, clean or replace air filters.

C. Requirements:

1. Ground Water System: Test hydrostatically to 100 psi for 4 hours without loss of pressure.
2. Repair leaks and retest until leaks are eliminated.

D. Ductwork Requirements:

1. Test all systems at 2-inch static pressure, using a Pacific Air Products "Port-O-Lab" or "Rolok" testing machine.
2. Maximum allowable leakage percentage is defined as DFM air leakage per cubic foot VOLUME of duct section tested. This is not percentage of design air flow. Leakage shall not be greater than 10% duct volume per minute.
3. Ductwork Pressure Testing:
 - a. In compliance with procedures for Medium Pressure Ductwork as stated in SMACNA's "HVAC Air Duct Leakage Test Manual" 1985, First Edition.
 - b. Test supply, return and relief duct at 2" wc pressure for 24 hours with 5% maximum pressure loss.
 - c. Repair leaks and retest until criteria is met and Owner's Representative has signed off.

3.20 CERTIFICATES

A. Furnish signed certificates stating that:

1. Systems have been thoroughly cleaned as specified.
2. Lubrication of items has been completed.
3. Clean set of filter media is installed.

B. Specified systems have been tested:

1. Ground Water

3.21 TEMPORARY HEAT

- A. The mechanical system may be used for temporary heat under the following conditions:
 - 1. Approval of use by Owner's Representative.
 - 2. The return and exhaust air ductwork is tightly sealed prior to the return and exhaust air grilles.
 - 3. The units run on all outside air and the outside air temperature is above 40 degree F.
 - 4. Filters are in place in the units and changed frequently (every 14 days maximum) to prevent accumulation of dirt on the fins of the coil.
 - 5. If the filters are not frequently changed, the Contractor will have the coils in the units steam cleaned at his expense to original factory conditions.

3.22 BENEFICIAL USE

- A. When Contractor determines work is substantially complete and ready for beneficial use, request inspection to establish date of substantial completion in accordance with Division 1.

3.23 SITE OBSERVATIONS AND CLARIFICATIONS

- A. Engineer is responsible to make site observations during construction. These observations can be scheduled to coincide with site clarification requests. Engineer (Engineering Office) is not responsible for providing field supervision. Clarification requests shall be written and accompanied by a drawing denoting request. The Engineer at his discretion can charge the Contractor for additional site visits requested by Contractor.

3.24 START-UP AND SUBSTANTIAL COMPLETION INSPECTION

- A. Prior to substantial completion inspection, provide start-up, test and adjustment of each item of mechanical equipment by qualified field personnel. Coordinate controls furnished with equipment and system operating controls. Calibrate and integrate to operate as specified. Systems balancing can be uncompleted at this time.
- B. Coordinate with General Contractor to establish a substantial completion date. General Contractor to notify Architect of same.

3.25 FINAL INSPECTION

- A. Final Inspection shall take place after all Substantial Completion Inspection "punch list" items have been completed and the enclosed request form and completion documents have been received by the Architect. Review of "As Built Drawings", Balancing Logs and "O & M" manuals will be done at this time.
- B. The Engineer is responsible for making said inspection. Any additional inspections will be at Contractor's cost deducted from retainage.

3.26 REQUEST FOR FINAL INSPECTION

The undersigned formally requests final inspection on the following project by the Engineer of record. The requesting Contractor certifies that all work designed by Engineer has been completed according to the project contract documents, and that all systems are functional and ready for final inspection at this time. It is further certified that completion documents (complete operating and maintenance manuals, as built drawings, balancing reports and all certificates) have been delivered to the Engineer of record a minimum of three working days prior to requested date of final inspection. Engineer will confirm date of final inspection as soon as the submitted documents have been reviewed and found to be acceptable.

Contractor agrees if Engineer attempts to perform final inspection and project is incomplete or not completely functional, contractor will pay Engineer for subsequent follow up inspection. Cost of performing additional final inspection for this project is estimated at \$1,000.00

Job Name: _____

Owner: _____

Building Location: _____

Date Inspection Requested: _____ Time: _____

Date Completion Documents Delivered: _____ Via: _____

REQUESTING CONTRACTOR:

Telephone: (_____) _____ Fax: (_____) _____

Firm Name: _____

Address: _____

Project Foreman: _____

Signature of Officer of Firm: _____

Title: _____

Date: _____

Return To: Paraclete P.S., Inc.
7510 N.E. Vancouver Mall Drive #100
Vancouver, Washington 98662

360/254-9234 Voice 360/254-7885 Fax

Original signed document must be mailed or delivered.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 2305000

SECTION 230519 - METERS AND GAUGES FOR HVAC PIPING - ALTERNATE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install as described in Contract Documents all meters and gauges.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 PRESSURE-TEMPERATURE TAPS

- A. 1/4-inch tap fitting to receive either pressure or temperature probe. Installed at inlets and outlets of automatic valves and where otherwise shown. Manufacturer: Pete' Plug. In addition, furnish four 0-100 psi pressure gauges, four adapters with probes, two 5-inch stem pocket testing low temperature probes 25F, and two 5-inch stem pocket testing high temperature probes 50F - 200F; all for the Owner's use.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install per manufacturer's recommendations and details on Drawings.
- B. Install pressure temperature tap vertically up. Horizontal only if dictated for accessibility.
- C. Install circuit setters vertically up. Horizontal only if dictated for accessibility.

END OF SECTION 230519

SECTION 230523 - VALVES - ALTERNATE

PART 1 - GENERAL

- A. Valve rating shall exceed respective system operating pressures. All valves shall be line size unless otherwise indicated. Selection of valve trim materials shall be as recommended by manufacturer for temperature and pressure applicable.

1.2 SUBMITTALS

- A. Required for all valve types used.

PART 2 - PRODUCTS

2.1 MATERIALS AND MANUFACTURERS

- A. Manufacturers: Jenkins Bros.; Kennedy Valve Mfg. Co.; Stockham Valves & Fittings, Inc.; Crane Co.; Hammond; Walworth Co.; The Wm. Powell Co.; Milwaukie, Lunkenheimer Co.; Nibco; Vic, Apollo; FNW; or special as specified.
- B. Ball Valves: To be used up to 3" size on water piping systems 150 psig or less. Crane Co.; Milwaukie; Hammond or Jenkins.

2.2 VALVES SCHEDULE

- A. Types:
 - 1. Ball Valves: Water
 - a. Milwaukie BA-200 (threaded), BA-250 (soldered) or Jenkins 900T; 1/2" through 2".
 - 2. Ball Valves 2 1/2" and 3":
 - a. Milwaukie BA-100 (threaded). Milwaukie BA-150 (soldered)
 - 3. Hose End Ball Valve with cap and chain:
 - a. Milwaukie BA-150H.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install valves with stems in vertical position with handles upward if possible. Valves may be rotated with stems in horizontal position. In no case are valves to be installed with handles down or with stems in less than horizontal position.

3.2 ADJUSTMENT

- A. Adjust packing for free operation of handles and leak free operation. Insure that handles have adequate clearance for proper operation.
- B. Operate each valve checking for tight shut-off and full flow. Inspect operation to insure that stem is not bent. Replace any bent stems, or damaged valves.

END OF SECTION 230523

SECTION 230529 - PIPE SUPPORTS - ALTERNATE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide labor, material and complete system described and shown. Provide any incidental work not shown or specified which can reasonably be inferred or taken as belonging and necessary.

PART 2 - PRODUCTS

2.1 PIPE SUPPORTS

- A. Approved Manufacturers: Anvil Corp. (ITT), Michigan, Fee & Mason MFG. Co. (ATO, Inc.), Carpenter Technology Corp., Pipe Shields, Inc., Tolco or approved equal.
- B. Pipe Covering Protection: Provide pipe cover protection at hangers on all continuous vapor barrier insulated piping. Anvil Fig 168. Pipe support sleeves to be 20 gauge sheet metal, 6 inches long roll formed to fit round insulation shape.
- C. Upper Attachments:
 - 1. Provide necessary unistrut or angles. Secure to Purlins or Joists.
 - a. Unistrut - threaded rod terminate with washer and 2 nuts.
 - b. Angles - "C" clamps for threaded rods with retaining clip.
- D. Lower Attachments: Shall be as follows, unless otherwise indicated
 - 1. Hangers for water tubing: Fig. 65 Anvil or equal clevis type, 1/2" through 2". Anvil Fig. 260, 2-1/2" and over.
 - 2. Uninsulated Copper Tubing all sizes: Fig. CT-65 copper-plated clevis.
 - 3. Cast iron all sizes: Fig. 590 clevis.
 - 4. UNI-STRUT Clamps:
 - a. PEX: TouchDown II Strut Clamp by Sioux Chief or approved equivalent.

PART 3 - EXECUTION

3.1 PIPE SUPPORTS

- A. Hanger Rods - Size & Spacing Schedule - Maximum Hanger Water and Waste

PIPE	WEIGHT PER FOOT (WITH H ₂ O)	MINIMUM HANGER ROD SIZE	PEX PIPING
1/2"	1.0	1/4"	2'-8"
3/4"	1.4	1/4"	2'-8"
1"	2.1	1/4"	2'-8"
1-1/4"	2.9	3/8"	2'-8"
1-1/2"	3.6	3/8"	2'-8"

END OF SECTION 230529

SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Provide identification for HVAC piping, ductwork, and equipment as described in Contract Documents.

PART 2 - PRODUCTS

2.1 IDENTIFICATION

- A. Pipe Markers: Pipes shall be labeled with "glue-on" labels manufactured by W.H. Brady Company, or Seton. For pipe covering sizes up to and including 1-inch outside diameter, select labels with 1/2-inch letters. For sizes from 1-1/4 to 2-inch outside diameter, 3/4-inch letters; above 2-inch outside diameter, 2-inch letters. The pipe markers shall be identified and color coded as follows:

- 1. Color

Service	Pipe Marker	Background
Ground Water Supply	"Ground Water Supply"	Green
Ground Water Return	"Ground Water Return"	Green

- - B. Equipment Name plate of black phenolic resin with white 1/2-inch high letters attached to or adjacent to each piece of equipment including but not limited to the following: Heat Pumps.

PART 3 - EXECUTION

- A. Provide with flow arrows indicating flow direction. Pipe markers to be placed on each side of wall penetrations and a maximum of 20 feet on center. Pipe markers to be placed on pipe risers from equipment.

END OF SECTION 230553

SECTION 230593 - TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SCOPE

- A. Provide all necessary instruments for testing, adjusting and balancing of HVAC systems.

1.2 DESCRIPTION

- A. Provide the services of an independent firm as specified hereafter; specializing in the balancing and adjusting of air and water systems (should not be associated or owned by the Contractor). The work generally to include the following:
 - 1. Adjust supply, return and exhaust volumes to the amounts shown, within 5% variation except as approved (10% total variation out-to-out).
 - 2. Adjust outside air dampers for minimum outside air requirements indicated.
 - 3. Adjust fan speeds for required air volumes.
 - 4. Record water temperature and pressure drop through heat pump at full cooling and full heating.
 - 5. Record supply air discharge temperature at fully cooling, full heating and economizer cycle for WSHP-1.
 - 6. Provide equipment data for all fans with equipment identification, motor data, and operation data on motor.
 - 7. Test heat pumps air flow units in:
 - a. Full cooling
 - b. Economizer (WSHP-1 only)
 - c. Full heating

1.3 FIRMS

- A. Air Balancing Specialty, Inc. 503.230.2332, Air, Inc. 541.484.1928, Neudorfer Engineers, Inc. 503.235.8924, or Precisionaire Northwest, 503.651.3120, only.

PART 2 - PRODUCTS - Not Used

PART 3 - EXECUTION

3.1 PROCEDURES

- A. The air system is to be adjusted in accordance with standard procedures and recognized practices of the Associated Air Balance Council and as approved by the Architect.

B. Air System Balancing

1. Minimize throttling losses caused by balancing dampers and other restrictions.

- C. The Contractor shall award the test and balance contract to the approved agency as soon as possible after receipt of his Contract to allow the balance and testing agency to schedule this work in cooperation with other trades involved and comply with the completion date. All instruments used shall be accurately calibrated within six months of balancing and maintained in good working order. If requested, the test shall be conducted in presence of the Engineer. Include an extended warranty of six months after completion of test and balance work, during which time the Engineer at his discretion may request a recheck, or resetting of any equipment or device as listed in the test reports.

3.2 SUBMITTALS OF BALANCING

- A. Complete balancing log of all air outlets indicating actual field measured air volume and percentage of design air volumes. Provide Drawings identifying location of all outlets.
- B. Water temperature and pressure readings.
- C. Supply air discharge temperatures.
- D. Complete equipment data sheets, indicating actual equipment performance, model numbers, bearing and belt data, motor nameplate data, and final balanced motor data.
- E. Additional Data: Provide all additional data as provided by Associated Air Balance Council (AABC) Standard forms
- F. Provide six copies of the above completed information to the Architect for review and insertion into the Operating and Maintenance Data.

3.3 COMFORT BALANCE

- A. The Balancing Contractor shall visit the site 14 days after final balance and make adjustments to the system to provide for specific areas of tenant complaints

END OF SECTION 230593

SECTION 230713 - HVAC DUCT INSULATION

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install HVAC insulation as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all items.

PART 2 - PRODUCTS

2.1 DUCT INSULATION

- A. Description:

- 1. External Insulation:

- a. 1.5 lb./cu.ft. density glass fiber blanket with vapor barrier jacket, k of 0.24 at 75°F mean temperature difference, similar to Manville "Microlite" with FSKL jacket.
- b. Double layer of polyethylene bubbles sandwiched between 2 layers of reflective aluminum sheet, anti-bacterial. Installed tight to duct R-4.3 vapor barrier less than 0.02 perms TVM or equivalent.
- c. Tape - Venture 1581A aluminum foil coated, pressure sensitive adhesive, UL-181A-P and UL181B-FX, nFoil or equivalent.

- 2. Internal Insulation: Matt faced acoustical board with thermal conductivity not to exceed 0.23 at 75°F mean temperature, and a minimum sound absorption coefficient of 0.50 at a frequency of 250 or 0.75 at a frequency of 1000.

- a. Must not use glue-on insulation holding devices in interior ducting.
- b. Manville "Linacoustic" with anti-bacterial coating.

INSULATION

DUCT LOCATION

R-VALUE

Not within conditioned space:

On exterior of building, on roof,
in attic, in enclosed ceiling space,
in exterior walls, in garage, in crawl spaces.

R-8¹

Not within conditioned space:

in concrete, in ground.

R-5.3

Supply air ducts above ceilings or in
interior walls with HVAC equipment supply
air temperature < 55 or > 105°F.

R-3.3

NOTE: Requirements apply to supply ducts, whether heated or mechanically
cooled. Mechanically cooled ducts requiring insulation shall have a vapor retarder,
with a perm rating not greater than 0.5 and all joints sealed.

¹. With approved weatherproof barrier.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

- A. Install in accordance with manufacturer's recommendation. External insulation with joints and seams lapped 3' minimum and stapled 3" on center; wired where required. Benjamin Foster 85-20 adhesive utilized as required. Lap insulation a minimum of 6" and seal vapor barrier jacket to duct surface where insulation types meet.
- B. Install mat finish surface on air stream side. Secure insulation to cleaned sheet metal duct with continuous 100 percent coat of adhesive and with 3/4 inch long mechanical fasteners 12 inches on center maximum and at no more than 2" from any cut or exposed edge. Pin all duct liner.
 - 1. Adhesive to be water based, Duro-Dyne WSA, Hardcast 1A-901, United McGill Uni-tack or approved equivalent.
 - 2. Mechanical fastener to be Duro-Dyne with NC-1 nylon stop clips or approved equivalent. Glue-on type not allowed.
- C. Accurately cut liner and thoroughly coat ends with adhesive. Butt joints tightly. Top and bottom sections of insulation shall overlap sides. If liner is all one piece, folded corners shall be tight against metal. Ends shall butt tightly together.
- D. Provide sealant on all exposed and or raw edges and sheet joints such as United Duct Sealer, water based, or approved equivalent.

3.2 APPLIED LOCATIONS

A. SUPPLY DUCTS

- 1. In Attic and Garage R-8
- 2. In Conditioned Space R-3.3
- 3. In Mechanical Equipment Room R-3.3

B. RETURN DUCTS

- 1. In. Attic and Garage R-8

2. In conditioned space not required
3. Unless noted for internal insulation on drawings R-0, R3.3

C. OUTSIDE AIR DUCTS

1. In Garage Not Required

D. RELIEF DUCT

1. Within 5 feet of connection to return air duct R-3.3

END OF SECTION 230713

SECTION 230719 - HVAC PIPE INSULATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Includes but not limited to:

1. Insulation of ground water pipe and fittings.

PART 2 - PRODUCTS

2.1 PIPE INSULATION

A. Description: One piece, multipurpose preformed glass fiber pipe insulation with vapor barrier jacket, k of 0.25 at 75°F mean temperature difference similar to Schuler "Micro-Lok AP" jacket.

B. Above Ground Water Piping:

Pipe Size	Temperature	Insulation Thickness
less than 1"	400 - 600 F	1/2"
1" - 1-1/2"	400 - 600 F	1/2"

C. Alternate Ground Water Pipe Insulation:

1. Flexible, elastomeric, expanded closed cell insulation, thickness 1/2". Material meeting flame spread of 25 or less and smoke developed of 100 or less as tested by ASTM E 84-81a. Provide in tubular or slit tube form. Thermal conductivity of 0.27 at 75°F mean temperature as tested by ASTM C177 or C518. Water vapor permeability 0.17 (ASTM E96, procedure B). Maximum water absorption - 3% by weight.
2. Contact Joint Sealer: Armaflex 520, BFG construction adhesive No. 105, Therma-Cel 950, NOMACO or IMCOA equivalent.
3. Manufacturer: Armaflex, Rubatex, CSG Ultrafoam, Therma-Cel, IMCOA or NOMACO.
4. Thickness per 2.2B and C above.

2.2 FITTING, FLANGE, VALVE, AND PIPE TERMINATION INSULATION

A. Description: Preformed PVC insulated fitting cover similar to Manville Zeston 2000 to be secured over fittings insulated per above for various services.

PART 3 - EXECUTION

3.1 WATER PIPING INSTALLATION

- A. Install in accordance with manufacturer's recommendations. Seal all insulation to maintain continuous vapor barrier on ground water piping. Insulation continuous through hangers, floors, walls, etc. Provide 6 inches long 22 gauge steel sleeve at each pipe support and penetration.
- B. Insulate valve bodies, bonnets, and grooved pipe fittings utilizing Zeston preformed pipe covering. Insulate valve bonnets and unions in ground water piping with material of same thickness as adjacent pipe covering. Use insulating cement and field-applied fire retardant jacket, or large size pipe covering as required for neat appearing installation.
- C. Piping to be insulated to equipment shut off valve.

3.2 FLEXIBLE, ELASTOMERIC, EXPANDED CLOSED CELL INSULATION

- A. Slip insulation on piping before piping and fittings are assembled keeping slitting of insulation to a minimum.
- B. Longitudinal joints, as necessary, to be at top of pipe.
- C. Seal butt joints and longitudinal "slits" with joint sealer.
- D. Wrap valve bodies and fittings with insulation and seal with adhesive.

END OF SECTION 230719

SECTION 230900 - INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 - GENERAL

1.1 COMPLETION REQUIREMENTS

- A. Provide two (2) hours of time to instruct Owner's personnel in operation of the system. Provide two (2) hours of time for followup.

1.2 SERVICE AND GUARANTEE

- A. The Contractor shall guarantee the Control System installed under this Section of the Specification to be free from defects in workmanship and material under normal use and provide service for a period of one year after acceptance by the Owner. After completion of the installation, Contractor shall completely adjust all control equipment provided under this Contract; place the system in operation, submit for Architect's approval, and instruct the operating personnel in the operation of the Control System.

PART 2 - PRODUCTS

2.1 TEMPERATURE CONTROL WIRING

- A. All control wiring (line voltage or low voltage), required to complete the temperature Control System, system shall be installed by the Contractor in accordance with Division 16 and all Electrical Codes. Do not provide more than 9 wires in any conduit for power wiring.
- B. Labels shall be provided to clearly identify all components whose functions are not clearly apparent and shall be coded to designation provided on Shop Drawings. Labels for items on or outside of control panels shall be engraved plastic or plastic sandwich attached in a permanent manner. Handwritten or stenciled labels will not be acceptable.

2.2 COOLING/HEATING TIME SWITCH THERMOSTAT

- A. Honeywell T7351 with appropriate subbase
- B. Provide with auxiliary contacts.

2.3 120 VOLT WIRING

- A. 14 gauge stranded, 600 volt insulation minimum.

2.4 LOW VOLTAGE WIRE

- A. Type THHN conductors of not less than 18 gauge stranded and with two wires for each run.

2.5 THERMOSTAT CABLE

- A. Thermostat Cable: 12, 8, or 4 conductor, 18AWG solid copper wire, insulated with high-density polyethylene. Conductors parallel enclosed in brown PVC jacket

2.6 RELAYS

- A. Honeywell R8222 Series, gold tipped.

2.7 TRANSFORMERS

- A. 120 / 24 V, 50VA Honeywell AT150F.
- B. 120 / 24 V, 75VA Honeywell AT175F

2.8 DAMPER OPERATORS

- A. Damper Actuators:
 - 1. Electric type equipped for Class I wiring.
 - 2. Shall not consume power during UNOCCUPIED cycle or use chemicals or expandable media.
 - 3. Have built in spring return.
 - 4. Approved Product:
 - a. Outside and Return Air: Floating and Modulating Honeywell MS7510A2008.
 - b. Relief Air: Two position Honeywell 50524-2 pos. Also shown as MS8105 1008

2.9 ECONOMIZER CONTROLLER

- A. Honeywell Jade Controller.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The control equipment and connecting wiring shall be installed in a neat and workmanlike manner by trained mechanics.

- B. All exposed conduit shall be run parallel to or at right angles to the building structure, and shall be concealed in all finished spaces.
- C. All concealed temperature control wiring shall be in accord with NEC latest edition.
- D. Provide conduit in wall for all thermostat wires.
- E. Provide junction box for mounting of thermostat at 4'-0" above finished floor.

3.2 COOLING/HEATING TIME SWITCH THERMOSTAT

- A. Mount thermostat on junction box at locations indicated on drawings; calibrate. Set 75° F. cooling and 70° F. heating, occupied hours; 80°F cooling, 62°F heating during unoccupied hours. Set evaporator fan to run continuously during occupied hours, intermittently during unoccupied mode.
- B. Units with economizers, provide wiring and relays to integrate refrigeration and economy cycle operations. Set refrigeration to operate at 550 F. and above.

3.3 DAMPER OPERATOR

- A. Install operator after control dampers have been installed. Wire complete.
- B. Provide information to Electrical Contractor as to location of required transformers. Provide transformers to Electrical Contractor for installation. After installation is complete, wire to control panel terminal blocks. Install transformers and wire complete.
- C. Provide all wiring, relays and additional control items to make complete and operating systems.

PART 4 - SEQUENCE OF OPERATION

4.1 WATER SOURCE HEAT PUMP: WSHP-1

- A. Evaporator fan to operate continuously with outside air damper open during occupied hours. Fan runs intermittently during unoccupied hours.
- B. Outside Air Damper: Cooling and/or heating enabled from thermostat. At 55° F. and below, cooling from economizer control modulation of outside and return air damper. Refrigeration cooling above 55° F. with outside air damper 100% open. Outside air damper returns to minimum position at 75° F. outside air temperature and on call for heating.
- C. Outside Air Damper open during occupied periods, closed during unoccupied periods.
- D. Outside air damper fails to closed position.
- E. Relief and Return air dampers closed during unoccupied periods.

4.2 WATER SOURCE HEAT PUMP: WSHP-2

- A. Evaporator fan to operate continuously with outside air damper open during occupied hours. Fan runs intermittently during unoccupied hours.
- B. Cooling and/or heating enabled/disabled from thermostat.
- C. Outside air damper open during occupied periods, closed during unoccupied periods. Fails to closed position.

4.3 CEILING EXHAUST FANS

- A. CEF-1: Enabled/disabled from time switch portion of WSHP-1 thermostat enabled during occupancy and/or bypass time periods.
- B. CEF-2: Enabled/disabled from time switch portion of WSHP-2 thermostat enabled during occupancy and/or bypass time periods.

END OF SECTION 230900

SECTION 232113 - HYDRONIC PIPING - ALTERNATE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install hydronic piping and appurtenances as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 ALL COMPONENTS

- A. Components of the buried tubing system shall be provided by one manufacturer, including: tube, fittings, and other ancillary items required for a complete installation.

2.2 UNIONS AND FLANGES

- A. Unions:
 - 1. Provide unions at each threaded or soldered connection to equipment and tanks as indicated on the drawings.
 - 2. Unions shall be located so piping can be easily disconnected and of type specified in following schedules:
 - a. Steel: Sizes: 2" and smaller. Union 250 lb. screwed galvanized malleable iron, ground joint, brass to iron seat.
 - b. Screwed Copper or Brass Pipe: Sizes: 2" and smaller. Union 150 lb. cast brass, ground joint, brass to brass seat, with threaded ends.
 - c. Dielectric Unions: For dissimilar metal pipe connection (from copper to steel) to prevent galvanic action and corrosion. Epso Sales, Inc. Model FX or GX as applicable, or approved equal.
 - 3. Flanges may be used in welded systems in place of unions.

2.3 MATERIALS

- A. Tube

1. Tube shall be cross-linked polyethylene, with maximum working pressure/temperature of 160 psi @ 73.4 degree F, 100 psi @ 180 degree F, 80 psi @ 200 degree F. These Temperatures and pressure ratings shall be issued by hydrostatic stress board of PPI (Plastic Pipe Institute). PPI is a division of SPI (Society of Plastics Industry).
 2. The tube shall be manufactured in accordance with ASTM standard specification F 876. The tube shall be listed to ASTM by independent third party testing laboratory.
 3. The tube shall be of cross-linked polyethylene manufactured by the "Engel Method". The tube shall have an oxygen diffusion barrier capable of limiting oxygen diffusion through the tube to no greater than .10g/m³/day @ 104 degree F water temperature.
- B. Fittings shall be manufactured of dezincification resistant brass. These fittings must be supplied by the tube manufacturer. The fittings shall consist of a compression fitting with insert, compression ring and a compression nut.
- C. Manufacturer:
1. Wirsbo he-PEX or approved equivalent.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. All fittings should be accessible for maintenance. Pipe enters the building to first required fitting in Mechanical and from the last fitting to where the pipe exists the building.
- B. Test at 100 psi without loss of pressure for 4 hours.

END OF SECTION 232113

SECTION 232116 - HYDRONIC SPECIALTIES - ALTERNATE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install as described in Contract Documents all hydronic specialties.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 PRESSURE-TEMPERATURE TAPS

- A. 1/4-inch tap fitting to receive either pressure or temperature probe. Installed at inlets and outlets of automatic valves and where otherwise shown. Manufacturer: Pete' Plug. In addition, furnish four 0-100 psi pressure gauges, four adapters with probes, two 5-inch stem pocket testing low temperature probes 25F, and two 5-inch stem pocket testing high temperature probes 50F - 200F; all for the Owner's use.

PART 3 - EXECUTION

3.1 GENERAL

- A. Install pressure temperature tap vertically up.

END OF SECTION 232116

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install metal ducts and related products as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 ABOVE GROUND METAL DUCTS

- A. Ducts, plenum chambers and casings of zinc coated, lock-forming quality steel sheets meeting requirements of ASTM A653 with G 60 coating.
- B. Standards: All ductwork shall conform to latest ASHRAE, SMACNA, NFPA 90 A, and UL requirements.
- C. Round Ductwork
 - 1. Up to 14" in diameter - "Snap-Lock" longitudinal seam type.
 - 2. Above 14" in diameter - Spiral wound lock seam with factory fittings only as manufactured by Arctic Sheet Metal, Arrow, Robert Lloyd Sheet Metal, Rolock, Semco, Streimer or United.
- D. Duct Hangers and Supports: All duct hangers and spacing for low pressure, round and rectangular ductwork shall conform to latest SMACNA Standards unless otherwise indicated.
- E. Supplementary Steel: Provide all necessary supplementary steel for support or attachment of equipment, pipe and duct supports in shafts and between building structural members.

2.2 DUCT SEALER

- A. Approved Products
 - 1. S2 by Duro Dyne
 - 2. Versa Grip 102 by hardcast Inc.
 - 3. Water Base Duct Sealer by United McGill Corp.

PART 3 - EXECUTION

- A. Fabricate ducts to be straight and smooth with joints neatly finished.

3.2 GENERAL

- A. Where internal acoustic insulation is required, increase duct size to provide clear inside dimensions shown, with interior surfaces to unlined duct aligned with surface of internal insulation at transition point.
- B. Rectangular Ductwork
 - 1. Bare Metal Rectangular Ductwork: "S" and drive, Pittsburgh and Government locks "Ductmate", "Ward" or "TDC" shall be used for all low pressure rectangular duct.
 - 2. 1" internally insulated Metal Rectangular Ductwork: "S" and drive, Pittsburgh and Government locks, "Ductmate", "Ward", or "TDC" shall be used for all low pressure rectangular duct.
 - 3. 2" internally insulated Ductwork: Joints to be made with "Ductmate" or "Ward" only.
- C. Round ductwork
 - 1. Snaplock Joints: Beaded crimp slip type with sheet metal screws equally spaces at a maximum of 90 degree or 8 " apart whichever limit is more restrictive. Interior slip coated with duct sealer.
 - 2. Spiral Joints: Couplings with duct sealer applied to inside. 1" minimum overlap. Sheet metal screw at a maximum of 90 degree or 8 " apart whichever limit is more restrictive.

3.3 SEALING

- A. Duct Sealing:
 - 1. Seal all longitudinal ductwork seams.
 - 2. Seal all transverse joints. Not required for "Ductmate", "Ductmate Junior", "Ward", or "TDC" joints unless undue pressure loss occurs.
 - 3. Seal all Snap-Lock elbow gores.

3.4 INSTALLATION

- A. Ductwork
 - 1. Install in accord with SMACNA manual "HVAC Duct Construction Standards, Latest Edition.
 - 2. Erect all duct work true to dimensions indicated, straight and smooth on inside with neatly finished joints lapped in direction of air travel.
 - 3. Install supply ducts above return or exhaust ducts where possible, provide long, straight duct drops to diffusers for proper diffuser performance.
 - 4. Change in duct size or shape necessitated by interference with other work shall be made using rectangular equivalents of equal friction loss without extra cost.

5. Where internal insulation is required, increase duct size to provide clear inside dimensions shown, with interior surfaces to unlined duct aligned with surface of internal insulation at transition point.
6. Support ductwork from roof or walls. Provide system free from buckling, warping, breathing, air leakage or vibration.
7. Install in manner that allows access to volume dampers, equipment, etc.
8. Leave system in perfect working order and coordinate with System Air Balancer as to damper locations and settings.

END OF SECTION 233113

SECTION 233116 - FLEXIBLE DUCT

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install non metal ducts per Contract Documents.

PART 2 - PRODUCTS

2.1 INSULATED FLEXIBLE DUCT

- A. Assembly, including liner, vapor barrier and insulation listed under UL Standard 181 as a Class I flexible air duct and complying with NFPA standards 90A and 90B. Mold and mildew resistant.
- B. Factory made assembly consisting of CPE, polyethylene or polyester core bonded to a spring steel wire helix and supporting a fiberglass insulating blanket and low permeability outer vapor barrier.
- C. Application
 - 1. Supply in conditioned spaces - R4.2
- D. Manufacturer: Thermaflex M-KE, Flexmaster equivalent or approved.

2.2 UNINSULATED FLEXIBLE DUCT

- A. Assembly including fiberglass cloth fabric listed under UL Standard 181 as Class I flexible air duct and complying with NFPA Standards 90A and 90B. Mold and mildew resistant.
- B. Factory made assembly consisting of coated woven fiberglass cover bonded to a spring steel wire helix.
- C. Application
 - 1. Return in conditioned spaces - R0.0
- D. Manufacturer: Thermaflex S-TL, Flexmaster or approved.

2.3 CINCH BANDS

- A. Nylon, 3/8 inch meeting flame spread of 25 and smoke developed of 50.

- B. Manufacturer: Panduit, Tyton or approved.

2.4 HANGER STRAP

- A. UL Listed for use in Return air plenum space.
- B. 1-1/2 inch wide, adjustable with releasable clasp.
- C. Manufacturer: Thermaflex Flex Tie or approved.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Hang duct from structure with hanger strap at 5'-0" on center maximum.
- B. Provide duct sealer on 3 inch metal collar, slip flexible duct onto collar with minimum 3 inch coverage and secure with cinch strap.

END OF SECTION 233116

SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install accessories in ductwork as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 ACCESSORIES

- A. Turning Vanes

- 1. General: Provide turning vanes in rectangular miter elbows. Vanes factory or job fabricated. Use factory fabricated vane spacing rails for maximum spacing of 2" on center.
- 2. Vane spacing rails to be minimum 24 gauge for ducts operating under 2" S.P. with single wall vanes.
- 3. See Detail on Drawings.

- B. Access Doors, Low Pressure Ductwork

- 1. General: Provide access doors in ductwork at control damper. Door size minimum to be 12" by 12" size. Install access doors in side of horizontal ducts
- 2. Manufacturer: Air Balance FSA 100, Ruskin ADH2, METCO, or approved.

- C. Flexible Connections

- 1. General: Flexible connections shall be installed on inlet and outlet duct connections of fans and ventilating units and at building expansion joints, approximately where indicated. Fabric shall be of weight and strength of service required, properly fitted to render airtight. Fabric of sufficient width to provide minimum space of 4" between connected items.
- 2. Centrifugal Fans:
 - a. Supply, Return and Exhaust Systems: Thirty ounce (30 oz.) glass fabric, fire retardant and airtight, weather resistant, coated with neoprene on both sides, Ventfabrics, Inc. "Ventglas", Duro-Dyne MFN.

- D. Volume Dampers

1. General: Provide adjustable volume dampers at all duct junctions on low pressure supply, return and exhaust ductwork where indicated and in branch ducts for each supply, exhaust and return openings for adjusting air volumes. Dampers installed with end bearings and regulators.
 - a. Bearings: Provide end bearings for dampers manufactured by Young Regulator, #656; Ventlock #607.
2. Single Blade Dampers (B):
 - a. General: Single blade dampers job or factory fabricated of no less than 24 gauge galvanized steel, and no larger than 12" x 48", reinforced or crimped for rigidity, with pivot rod extending through duct.
3. Multi-Blade Damper (B):
 - a. General: Opposed blade damper shall be factory fabricated, and used where width of single blade damper would exceed 12" or as indicated.
4. Regulators:
 - a. Accessible Damper: Regulators locking type with lever handle, position indicator and lock nut as manufactured by Young Regulator #403; Ventlock #64l.
 - b. Plaster Surfaces: Regulators concealed type with lever, position indicator and lock nut enclosed in round die-cast box with female threads to accept male threaded chrome plated cover as manufactured by Young Regulator, Model 315, Ventlock. Aluminum frame linkage and blades. Blades with vinyl edge seals.
5. Bearings to be of zytel.
6. Counter balance to be adjustable zinc plated bars on blade.
7. Manufacturer: Ruskin CBD6 or approved equivalent.

2.2 CONTROL DAMPERS

- A. Class I with maximum leakage rate of 4 cfm per square foot at 1.0 inch water column. AMCA 5000.
- B. Airfoil blades in galvanized frame, blade and jamb seals for shaft mounting of damper actuator.
- C. Manufacturer: Greenheck VCD-42, Ruskin, or approved equivalents.

PART 3 - EXECUTION

- A. Turn vanes installed permanently in ductwork in 90 degree elbow so that no vibration of vanes occur.
- B. Flexible connections installed at inlet and outlet of rotating equipment.

- C. Backdraft damper secured in ductwork in a manner that allows free movement of blades and in direction of air flow.
- D. Install regulators. In hard ceilings install concealed type damper regulator.
- E. Install dampers and control dampers securely to duct in a manner that damper fits against sheet metal walls, bottom and top. Cut internal insulation to allow damper to fit against wall. Seal all cut edges of internal insulation.
- F. Install louvers per Manufacturer's installation instructions and details on drawing.

END OF SECTION 233300

SECTION 233429 - HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish and install power ventilators as described in Contract Documents

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 CEILING EXHAUST FAN

- A. DWDI-FC fans direct connected to motor all mounted on rubber-in shear isolators and enclosed in a sound attenuated cabinet. Fans statically and dynamically balanced on shaft.
- B. Manufacturer: Acme, Carnes, Cook, Greenheck, Penn or approved equivalent.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Ceiling Exhaust Fan
 - 1. Secure fan to framing.

END OF SECTION 233429

SECTION 233713 - DIFFUSERS AND GRILLES

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install diffusers, grilles and related items as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 AIR DISTRIBUTION PRODUCTS

- A. Ceiling Exhaust or Return Grilles:

1. Eggcrate for installation in 2' x 4' lay in T-bar ceiling panel system or gypsum board ceiling.
2. Finish: Baked white enamel.
3. For 2' x 4' T-bar provide extensions as required for lay in application.
4. Price 80C series for surface mount.
5. Price 80TB for T-Bar installation.

- B. Ceiling Diffusers

1. Steel construction with accessible perforated face. Adjustable air pattern deflectors located on perforated face.
2. Round or square neck.
3. Color: Baked white enamel.
4. Surface mounted module size:

Neck Size	Module Size
8 x 8	16 x 16
12 x 12	24 x 24

5. Manufacturer: Price PDS, Type 1 frame for surface mounting, Type 3 frame for T-Bar

- C. Ceiling Diffusers

1. Steel construction with accessible perforated face. Adjustable air pattern deflectors located on perforated face.
2. Round neck.
3. Color: Baked white enamel.

4. Manufacturer: Price PDS Type 1 frame for surface mounting, Type 3 frame for T-Bar.

PART 3 - EXECUTION

- A. Notify Architect when building is completed to such a point that temporary heat can be classified as permanent heat. If the Architect agrees, remove the temporary caps from the exhaust and return ducts and complete those systems installation.
- B. Install all diffusers, grilles and associated devices in accordance with Manufacture's instructions.
- C. Adjust pattern of supplies to those shown on plans.
- D. Correct any undesirable noise or draft problems associated with grilles, diffusers and mounted dampers. Devices with loose or vibrating parts shall be replaced.

END OF SECTION 233713

SECTION 233724 - WALL LOUVERS AND VENT

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install louver and vents and related items as described in Contract Documents.

1.2 SUBMITTALS

- A. Required for all products.

PART 2 - PRODUCTS

2.1 LOUVERS

- A. Extruded aluminum frame and "S" blades with "Bird" screen and extended sill.
- B. Prime coat for enamel finish.
- C. Ruskin ELF-375X, Greenheck, American Warming, Price or approved equivalent.
- D. See Drawing details.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Secure to structure. See details on drawings.

END OF SECTION 233724

SECTION 234100 - FILTERS - ALTERNATE

PART 1 - GENERAL

1.1 SCOPE

- A. Provide and install filters and related items as described in Contract Documents.

1.2 SUBMITTAL DATA

- A. Shop drawings, catalog and performance data for all items.

PART 2 - PRODUCTS

2.1 WATER SOURCE HEAT PUMP FILTERS

- A. Nominal 1-inch thick to fit into filter racks.
- B. Multi-pleats XL11-HC. by Koch Filter Corporation, Puralator or approved equivalent.
- C. Efficiency: 30-35% ASHRAE 52-1 1999; MERV 8 ASHRAE 52.5

PART 3 - EXECUTION

3.1 EXECUTION

- A. Install clean set of filters prior to air test and balance after Architect has given approval for removal of seals over diffusers and grilles.
- B. Provide one additional set of filters for owner's use.

END OF SECTION 234100

SECTION 260501 - GENERAL PROVISIONS

PART 1 - GENERAL

1.1 CONTRACT DOCUMENTS

- A. The General Conditions and General Requirements listed in Index to Specifications apply to the work of Division 26.

1.2 SCOPE

- A. Provide all labor, materials, equipment, transportation, and services necessary to supply, install, complete, adjust, make operable and balance systems indicated on Division 26 contract documents.
- B. Review all contract documents for reference to work to be provided by Section 26. Include all such work in base bid.
- C. Coordinate (convey) the electrical connection requirements as shown on the contract documents for the HVAC units with the mechanical contractor. Notify the Architect in writing of any proposed discrepancies for resolution prior to HVAC equipment purchase.

1.3 DRAWINGS

- A. Electrical Drawings: Drawings are diagrammatic, home runs may be regrouped or rerouted for a more economical installation if desired. Do not alter circuit functions or switching arrangements. The Architect reserves the right to make minor changes in the locations of equipment without additional charge provided such request is made prior to rough-in. (Plus or minus 6'-0".)
- B. Architectural and Mechanical Drawings: Check Architectural Drawings to coordinate location of outlets and switches with cabinets or other requirements. Check Architecture for door swings. Locate switches on the lock side of doors. Locate outlets in or above back-splash above countertops. Before submitting his bid, the Contractor shall familiarize himself with the Architectural and Mechanical plans. Locations of equipment shown on those plans govern. Coordinate the installation of the electrical systems including (but not limited to) panels, disconnects, boxes, conduits, lights, and devices, so as to prevent space use conflicts.
- C. Uncompleted Items: Outlets or equipment shown on the plans with no supply conductors or conduit indicated shall be completed as required.
- D. Items not Understood or Omitted: Prior to bidding, refer to the Architect all items in the plans and/or specifications that are in conflict, not understood or incomplete so that addenda may be issued to make corrections or clarifications. Equipment shown on the plans or listed in the specifications shall be included as if called for on both.

1.4 SPECIFICATIONS

A. Materials:

1. The specifications describe the quality of materials desired by written description and catalog number. Materials listed are those desired and shall be used unless written permission has been granted to use equal or better quality materials by other manufacturers.
2. Approval to use materials of other manufacturers shall in no way reduce the standards of quality set by the specifications. If materials installed do not meet the standards set by the specifications, they shall be removed and replaced with specified materials without additional cost to the Owner.

- B. Installation: The specifications list the method of installation to be followed and types of materials to be used. The type of materials used shall fit the application. Materials improperly installed or of a type not suitable for the application shall be removed and replaced with suitable materials without additional cost to the Owner.

1.5 "AS BUILT" DRAWINGS

- A. Electrical Contractor shall provide to the Owner two red line drawing reflecting all deviations from original electrical design. Drafting shall be neat, readable and complete.

1.6 ALTERNATE EQUIPMENT SUBMITTALS

- A. Alternate equipment submittals shall be submitted a minimum of ten (10) working days prior to bid. Provide the Electrical Engineer and Owner each with one copy of CSI Substitution Request Form and one set of catalog cuts of the submittal equipment. Faxed or e-mailed submittals will not be accepted. "Approved for bidding" does not constitute an unqualified approval of the product. All conditions of quality, function, size, safety, style and appearance shall be as specified.

1.7 APPROVAL OF SHOP DRAWINGS

- A. Approval of shop drawings does not remove the Contractor's requirements to comply with the intent of the Contract Documents. For shop drawing submittals that alter design conditions, electrical requirements, dimensions, functions, manufacturer, model, type, style, installation requirements, etc., it shall remain the responsibility of the Contractor to make all necessary adjustments, alterations, supply changes, trade coordination, etc., required to provide complete and operable systems. Any deviations from Contract Specifications shall be clearly noted in bold letters as such.

1.8 SUBMITTAL DATA

- A. Provide the Architect with six (6) bound and labeled brochures of catalog cuts or shop drawings of all items that are to be provided for the project. Each brochure shall include a cover sheet indicating Project name, Architect, Engineer, and Contractor's name, address, telephone and fax numbers. Each brochure shall contain a complete set of all types of material to be provided under this Contract. Partial submittals will not be accepted and will be returned as disapproved. Items not bound in brochure form will not be accepted. Four (4) copies shall be retained for the Owner-Architect-Engineer and two (2) copies shall be returned for the Contractor and the Supplier of Equipment. Make corrections and alterations as noted on returned drawings without additional charge where proposed materials do not conform to specifications or project requirements.
- B. Submittals should include at a minimum the following (Plus any product that differs from specified product):
 - 1. Conduits and Fittings
 - 2. Conductors
 - 3. Outlets & Plates
 - 4. Switches & Plates
 - 5. Occupancy Sensors
 - 6. Disconnects
 - 7. Fuses
 - 8. Service entrance equipment
 - 9. Panelboards (With Shop Drawings)
 - 10. Circuit Breakers
 - 11. Contactors
 - 12. Time Clocks & Photo-cells
 - 13. Lighting Fixtures, and Associated Control Equipment
 - 14. Emergency/Lighting/Packs
 - 15. Telephone/data distribution raceway system

1.9 TEMPORARY FACILITIES

- A. Provide temporary electrical power and telephone service for construction purposes as necessary for project construction. Coordinate provisions for temporary power and telephone with serving utility companies. Include all costs in base bid.

1.10 WORKMEN

- A. Employ a sufficient number of journeymen electricians and supervisors to insure orderly completion of the work.

1.11 INSPECTIONS AND TESTS

- A. All electrical work shall be inspected before concealment. Uncover work concealed and not inspected if so directed by jurisdiction having authority or Project Engineer.

- B. Test all service entrance equipment, feeders and branch circuits, etc., for shorts and grounds prior to energizing. Service entrance and feeders shall be meggered to ground. Provide written field report of tests to the owner.
- C. All systems shall be tested, adjusted and balanced for proper operation. The Owner and/or his official representative shall be instructed in their use and shown all controls and operating procedures. The operation of the systems shall be demonstrated in the presence of the Owner and Architect.
- D. Provide the Owner with five (5) sets of all operating and maintenance manuals and instructions necessary to properly operate and maintain the systems.
- E. Test all mechanical equipment connected to insure proper rotation and phasing.
- F. Check the horsepower of all motors connected against the size of heater elements in the starters. If they do not match, notify the motor supplier to provide the correct size and type.

1.12 DEFINITIONS AND ABBREVIATIONS

- A. NEC: National Electrical Code.
- B. EMT: Electrical Metallic Tubing.
- C. WP: Weatherproof.
- D. AWG : American Wire Gauge.
- E. CONTRACTOR: In this Division of the Specifications refers to the Electrical Contractor.
- F. FURNISH: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
- G. INSTALL: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
- H. PROVIDE: Except as otherwise defined in greater detail, the term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.

END OF SECTION 260501

SECTION 260502 - ELECTRICAL SYSTEMS SCHEDULE

PART 1 - GENERAL

1.1 SYSTEMS INCLUDED UNDER THIS DIVISION

- A. Work includes but is not necessarily limited to the following outlined systems as well as the general wiring to the project.

1.2 BASE BID: Shall include the general wiring to the building and the following systems:

- A. Secondary Distribution System
- B. Power wiring to equipment provided in other Divisions of the Contract. Power connections shall be made under this Division.
- C. General Wiring and Illumination System
- D. Signal and Communications Systems:
 - 1. Data/Telephone Duct System
- E. Other Work as Indicated in the Contract Documents.

1.3 SYSTEMS NOT INCLUDED UNDER THIS DIVISION

- A. Low voltage wiring (less than 100 volts) associated with the functional control of heating and ventilating, air conditioning or water heating control or refrigeration controls.

END OF SECTION 260502

SECTION 260503 - CODES AND STANDARDS

PART 1 - GENERAL

1.1 MATERIALS

- A. All materials shall be listed by the Underwriters Laboratory and bear the seal wherever standards of approval have been established and such service is normally provided by them. Adhere to all local requirements for materials approval. All conduits, boxes and fittings shall be manufactured in the United States.

1.2 UTILITY REQUIREMENTS

- A. Comply with all rules, regulations and requirements of the local serving utility and coordinate all service entrance and metering requirements with them before installation. Make all negotiations with the utility company and pay all connection charges or fees. If requirements are substantially different from those shown, notify the Architect so that corrective action can be taken.

1.3 PROJECT SITE

- A. Visit the project site and determine local conditions that affect this portion of the contract.

1.4 CODES AND REGULATIONS

- A. Install electrical work in strict conformance to the rules and regulations of legally constituted bodies having jurisdiction over the construction and use of the facility and the National Electrical Code latest edition.

1.5 PERMITS

- A. Arrange and pay for all permits and inspections of the work done. Work shall not be concealed until inspections have been made. Turn over certificates of inspections to the Architect.

1.6 WARRANTY

- A. The Contractor shall and hereby, does warrant that all materials (except specified otherwise) are new, free from defect, of current standard manufacture and design, of the quality, rating and type as shown or specified; and that any defect existing within the warranty period, due to improper or defective materials or workmanship, shall be corrected and resulting damage repaired without additional cost to the Owner. Warranty Period: One (1) year after substantial completion and/or occupancy.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 260503

SECTION 260520 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 GENERAL

- A. Materials listed set type and quality standards for the project. Materials listed are those desired. Materials approved as "equal" shall not change quality or intent of Contract Documents. If "approved" materials are not found equal to specified items upon visual inspection or test, they shall be removed and replaced with specified materials without additional cost. Sole decision as to "as equal" acceptability shall reside with the Engineer.

1.2 MATERIALS IDENTIFIED

- A. All materials shall be new and of current standard manufacture, design, and U.L. listed for intended application.

1.3 MATERIALS NOT LISTED

- A. Provide all items such as relays, control transformers, signal transformers, wiring, circuit extension, and device or equipment connections, etc., that are necessarily part of the finished system and required for logical functioning of the system.

1.4 UNAPPROVED MATERIALS

- A. Remove and replace with specified materials if so directed by Architect, without additional cost to Owner.

1.5 WORKMANSHIP

- A. Shall be best standards of industry and shall conform to specification methods. Un-workman-like work shall be removed and replaced at no additional cost.

1.6 COORDINATION OF WORK

- A. Coordination with plumbing lines, heating and ventilating duct work, etc., to eliminate space use conflicts.

PART 2 - PRODUCTS

2.1 CONDUITS: All wiring shall be in conduit or approved McCable.

- A. Rigid Metal Conduit: Hot dipped galvanized steel. General Electric, Republic, U.S. Steel, National or equal.
- B. Electrical Metallic Tubing: Seamless, sheradized or hot dipped galvanized steel.
- C. Rigid Plastic Conduit: (PVC) Polyvinylchloride. UL approved. Baldwin, Corlon or approved equal. For underground use only. Use only where code allows.
- D. Flexible Metallic Conduits: Shall contain separate grounding conductor, galvanized steel armour. Maximum length 72". Not approved for general wiring.
 - 1. Dry Locations: Columbia, Triangle or equal.
 - 2. Wet Locations or Exposed to Weather: Liquid tight, neoprene or vinyl jacket. Anaconda Sealtite, Type UA or equal.
- E. "MC" type cable:
 - 1. Approved only for 20-30 amp branch circuits where allowed by code.
 - 2. Aluminum armor.
 - 3. Insulated green ground conductor, minimum size #12 AWG.
 - 4. Final home runs shall be EMT and separate conductor in Common Areas.
 - 5. Manufacture: AFC Cable System, Inc., Type MC.
- F. Non-metallic Sheath Cable: Type NM-B, copper, solid maximum size #10, with ground wire, PVC jacket, THW insulation. General Cable or as approved.
- G. Fittings:
 - 1. Rigid Conduits:
 - a. Bushings - Insulating type with grounding lugs where required.
 - 2. EMT and Flexible Conduit: Fittings - All steel set screw type, pre-insulated. Fittings with die cast aluminum or pot metal components are not acceptable. Steel City or approved substitution.

2.2 CONDUCTORS

- A. Copper: Solid #12 AWG minimum size up to #10 AWG. Stranded for sizes #8 and larger. Fire alarm and signal circuits to be stranded.
- B. Aluminum: Minimum size #1 AWG, stranded. Where substituted for copper shall have equivalent ampacity and voltage drop. Resize conduits as required. ALCAN Stabiloy XHHW Alloy AA-8030, or Southwire XHHW Alloy #AA-8178 only.

C. Insulation:

1. General: Type THWN, THHN, XHHW.
2. Recessed Fixtures, baseboard heaters or other high ambient temperature locations. Type THHN.
3. Aluminum: XHHW.

2.3 OUTLET BOXES

- A. Steel, as best suited for the job intended. 4 inch square by 1-1/2 inches or more deep for general use. Device covers shall match finish to be applied to walls. For concrete block use square shouldered device covers so that box can fit into block cavity. Steel City, RACO or approved substitution.
- B. Outlet boxes supporting ceiling fans shall be UL approved for this application typical.

2.4 PULL AND JUNCTION BOXES

- A. General Use: Steel, with baked enamel finish and screw covers. NEMA 1 enclosures. Alwalt or approved substitution.
- B. Exterior Use: Cast aluminum with threaded conduit hubs and water tight screw covers.
- C. Installation:
 1. Junction boxes and pull boxes shall be installed so that they are accessible at all times. The Contractor shall be required to provide sufficient pull boxes to conform to Code requirements whether shown or not. If a box is required in inaccessible place, provide access panel.

2.5 SWITCHES AND RECEPTACLES

- A. Switches and receptacles shall all be of the same manufacture, style and type.
- B. Switches: 20 ampere, 120/277 volt, mechanically quiet type, ivory handle. Specification grade. Federal Spec. #W-S-896d.

<u>Manufacture</u>	<u>SPST</u>	<u>3 Way</u>
Hubbell	CS1221-I	CS1223-I
P & S	20AC-1-I	20AC-3-I
AH	1991-I	1993-I
Leviton	1221-2-I	1223-2-I

- C. Receptacles:

1. Duplex Convenience Outlets: 15 ampere, 120 volt, 2 wire with U-slot ground. Ivory. Shall be of same manufacture as switches. Reference Hubbell #CR5252-I. 20 ampere, 120 volt where noted Reference Hubbell CR5352-I. Provide 20 amp receptacle on all dedicated circuit receptacles.
 2. Provide GFIC type receptacle where shown on drawings or required by NEC or UBC. "Feed through" protection not allowed. Reference Hubbell GF5262-I.
 3. Specialized Outlets: As indicated on Drawings.
- D. Occupancy Sensors (Low Voltage): Dual Technology, ceiling mounted. Provide with ceiling mounting bracket, isolated auxiliary relays (1 no, 1 nc), power pack, and additional slave relay packs (where required for multi-circuit rooms) of correct voltage. The Watt Stopper #DT-200 with power pack #B120E-P or #B277E-P, slave pack #S120/277/347E_P as needed, or approved equal. For 360 degree coverage: Watt Stopper #DT-300. Alternate approved manufacturer: Sensor-Switch, Lutron, or as approved.
- E. Occupancy Sensors (Line Voltage): Dual Technology, ceiling mounted. 360 degree coverage. Watt Stopper #DT-355 or approved equal. Alternate approved manufacturer: Sensor-Switch, Lutron, or as approved.
- F. Occupancy Sensors (Wall Switch Type): Watt Stopper #WS-200, or approved equal. Alternate approved manufacturer: Sensor-Switch, Lutron, or as approved.
- G. Trim:
1. General: Single piece stainless steel in all areas. Non-magnetic chrome-nickel alloy #302 in kitchens, toilets and on brick or masonry walls. Type #430 for standard use.
 2. Weatherproof: Hubbell #WP26M (horizontal #WP26MH) (cast aluminum).
 3. Use standard sizes in all locations except on masonry or block walls. Use Type SO plates.

2.6 SAFETY SWITCHES

- A. Horsepower dual rated, type heavy duty non-fusible for general use. Provide with compression lugs where connecting aluminum conductors. General use NEMA 1. Exterior use rain tight NEMA 3R. Provide fusible disconnect switches where indicated or specified. Fusible safety switches shall incorporate factory installed rejection clips for use with Class "RK1" and "RK5" fuses. Switch doors shall be interlocked with handle to prevent opening when switch handle is in the "on" position. Identify all disconnects with permanent lamcoid label indicating load (equipment) served. 3/8" minimum letter height.

2.7 FUSES

- A. Motor circuits, U.L. Class "RK5" time delay. Non-motor circuits U.L. Class "RK1". Gould-Shawmut, Bussman, Economy, Littelfuse or as approved. Provide one spare set for each size and class supplied.

2.8 SINGLE PHASE MOTOR DISCONNECTS

- A. Provide manual motor starting switches with melting alloy type thermal overload relay protection for all fractional horsepower, single phase motors.

2.9 CONTACTORS

- A. For control of branch circuits. 30 ampere, multiple pole, mechanically latched, with coil clearing contacts. Number of poles as shown on the drawings. Square D Class 8903, LXG series, or equal in ASCO, G.E., Siemens, or as approved.

2.10 TIME CLOCKS

- A. Digital type for control of mechanically held contactors or RC switches. 24 hours, 365 day program type. Holiday capability, two channel, 2 X SPDT, and battery back-up. Two Single pole, double throw contacts, two channel. Tork DZS200BP(120V).

2.11 PHOTO-ELECTRIC CONTROLLERS

- A. Tork #2101.

2.12 SUPPORTING DEVICES

- A. Conduits:
 - 1. Single: Securely support raceway within 3 feet of every 90 degree bend, outlet box, junction box, device box, cabinet, conduit body, and other termination with approved straps, clamps, or hangers. Space supports every 10 feet maximum. Securely mount raceway supports, boxes, and cabinets in an approved manner by:
 - a. Expansion shields in concrete or solid masonry.
 - b. Toggle bolts on hollow masonry units.
 - c. Wood screws on wood.
 - d. Metal screws on metal.
 - 2. Multiple: Kindorf Channels with approved conduit straps or clips. Spaced 10'-0" on centers.
- B. Kindorf Channel installed exposed to the weather (any exterior use) shall be galvanized.

2.13 FIRE BARRIER MOLDABLE PUTTY

- A. U.L. listed, 3M Brand fire barrier moldable putty Type MPS or MPP.

PART 3 - EXECUTION

3.1 MOUNTING HEIGHTS

- A. Devices shall be as follows unless indicated otherwise by specified note on the drawings. Devices shall be located above or below top of wainscoting, adjacent to tackboards or bulletin boards and shall not cut through metal trim or be located in tackboards. Coordinate with Architectural Drawings prior to rough-in. Verify all heights prior to rough-in.

Control switches for lights, fan, etc.	45" to center line
Convenience outlets: Wall mount	18" to center line
over counter	45" to center line
Telephone/Data	
wall mount - desks	18" to center line
wall hung handset	45" to center line
Lights over lavatory mirror	6'-6"
Panelboards (to top of trim)	6'-6"

3.2 RACEWAYS AND CONDUITS

- A. Routing: Run concealed except where detailed as exposed or where surface metal raceways are specified; or by written permission where it is difficult or impractical to conceal.
- B. Outlet and Switch Box Placement:
1. In stud walls back-to-back boxes are not allowed. Separate boxes in adjacent rooms by a minimum of one stud.
 2. Outlet and Switch Box Placement: Provide box extensions as required to bring metallic box flush with final wall surface.
- C. Materials: All conduits above grade shall be metal unless indicated otherwise. Size non-metallic conduits to accommodate grounding conductors. Sizes shown on the drawings are for metal conduits unless shown otherwise.
- D. Minimum Sizes:
1. Power: 1/2 inch.
 2. Lighting: Home Runs - 3/4 inch. Switch legs and runs between outlets 1/2 inch.
- E. Usage:
1. Electrical Metallic Tubing: Use where exposed on ceilings, above suspended ceilings, in attics, hollow cavity walls or cavities of block walls. Not approved for burial, exterior areas, or casting in concrete. Maximum size two (2) inches. Conduit in hollow cavity of block walls being filled with concrete shall be rigid steel instead of EMT.

2. Rigid Galvanized Steel Conduits: Use where raceways are cast into concrete, solid masonry, exposed on walls, exposed to weather or in hazardous areas requiring liquid tight, dust tight or explosion proof wiring.
3. Flexible Metallic Conduits: Use to connect electrical apparatus subject to vibration, such as motors, fans, etc., and to connect recessed lighting fixtures in suspended ceiling installations. Maximum length 72". Not approved for general wiring.
4. Surface metal raceways may be used only where specified or by prior approval for remodel work where it is not practical to conceal wiring.
5. PVC Conduit: Where code use permits, raceways buried directly in the earth may be rigid Sch. 40 polyvinylchloride (PVC) sized to accommodate grounding conductors. Elbows shall be rigid steel conduit wrapped with Scotch #51 tape.
6. MC Cable: Where code use permits, approved for 20-30 amp branch circuits.
7. NM-B Cable: Where code use permits, approved for 20 or 30 amp branch circuits.

F. Installation:

1. Cut ends of all conduits square and ream. Make all joints water tight. Fittings shall be compatible with conduit used, secured water tight, and form a smooth transition from conduit to fitting. Make all bends with no flattening or wrinkling with a bender designed for use with the conduit used.
2. Make up conduit installed underground water tight and sealed. Conduit containing water shall be pumped dry and swabbed. If water is infiltrating and cannot be removed, then reroute conduits as directed without additional charge.
3. Conduits encased in concrete shall be securely attached and anchored to prevent movement during pouring, tamping and vibration of the concrete. Ends shall be sealed with factory seals. Replace conduits containing concrete as directed by Architect.
4. Conduits may be run in concrete slabs or floors as listed below with a minimum of 1 inch concrete over conduits. Boxes shall be flush and of sufficient depth to allow connecting conduits without disturbing reinforcing steel.

Slab Thickness	Maximum Conduit Diameter
2"	None
2 1/2"	1/2"
3 1/4"	3/4"
3 1/2 - 5"	1"

5. Conduits run beneath the vapor barrier under concrete floor slabs are classified as underground and shall be PVC.
6. Swab out all conduits clean and dry before conductors are installed.
7. Mark the location of all conduits stubbed out for future use with brass screw in concrete foundation directly above conduit and 12" above finished grade.
8. Run in neat rows with smooth uniform bends. Support multiple runs from Unistrut hangers in all exposed areas, spaces above ceilings or risers. Diagonal, crossed or haphazard, non-supported runs will not be allowed.
9. Service entrance ducts shall be spaced a minimum of 3 inches between outer walls of conduits. Use plastic "Duct Donut" underground spacers placed 7 1/2 feet apart.
10. All conduit penetrations of fire rated walls, ceilings or floors shall be sealed with specified fire barrier putty. The amount of caulking shall be in relation to the rating of the surface being penetrated. Comply with requirements of the Product Manufacturer and local codes. Maintain rating of penetrated item.

11. Sealing of Conduit Penetrations: Seal around conduit penetrations through walls or floors between conditioned (heated) and unconditioned spaces.

3.3 WIRES AND CABLES

A. Marking and Coding:

1. Wiring shall be color coded to conform to standard practices of the industry.
2. 120/240 volt system shall be solid colors with white neutral.
 - a. A-Phase - Black
 - b. B-Phase - Red
3. All control wiring shall be labeled and tagged with each conductor identified.
4. Power feeders using all black insulating wiring shall have phase identified with colored vinyl tape at all terminations and splices.
5. Identify all feeder or branch circuit loads in the same panelboards.

B. Insulation Value:

1. All wire contained in the same raceway shall have an insulation value to match the highest voltage between conductors of all circuits contained therein.

C. Products:

1. Pulling: Use pulling compounds as recommended by the wire manufacturer; do not exceed recommended pulling tensions; leave sufficient pigtails at each j-box or cabinet for make up.
2. Aluminum Conductors: All splices, terminations or connections shall be made with compatible fittings and non-oxide conductive paste.

END OF SECTION 260520

SECTION 260526 - GROUNDING

PART 1 - GENERAL

1.1 GENERAL

- A. General Conditions and General Requirements as listed in Index to Specifications apply to work under this Section.
- B. Provide a complete grounding system as shown and as required by the NEC and the local enforcing authority with common grounding point at the main distribution center.

PART 2 - PRODUCTS

2.1 CONDUCTORS:

- A. Main System Ground: Bare stranded copper per N.E.C.
- B. Bonding Jumpers: Copper minimum size #2 in switchboards and switchboard rooms.
- C. Bonding Conductors, Equipment: Copper per NEC requirements. Green insulation.

2.2 GROUND CLAMP

- A. Code approved.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The cold water system shall be used as the main system ground. Bond to a minimum size 2 inch metal cold water pipe, 20 feet of which must be in contact with the earth.
- B. Provide a concrete encased grounding electrode system to conform to Section 250-50c NEC. Bond to main cold water ground. This is in addition to, and not in lieu of, the cold water ground.
- C. Bond all drainage, sprinkler system plumbing, communications conduits, and all electrical distribution systems to ground as required by NEC.
- D. Provide 2- 10 foot long ground rods, 10 feet apart. Bond to System Ground.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 260526

SECTION 260700 - COMMUNICATIONS AND SIGNAL SYSTEMS

PART 1 - GENERAL

1.1 GENERAL

- A. General Conditions and General Requirements as listed in Index to Specifications apply to work under this Section.

1.2 SYSTEMS INCLUDED UNDER THIS SECTION

- A. Duct System for Telephone/Data System

PART 2 - PRODUCTS

2.1 DUCT SYSTEM FOR TELEPHONE/DATA SYSTEMS

- A. Provide a roughed-in conduit system only with finish trim on all outlets.
- B. Wiring and equipment shall be provided and installed by others.
- C. Products:
 - 1. Products shall conform to those specified in other sections of the Specifications.
 - 2. Conduits: Run conduit from each telephone/data outlet to accessible ceiling space (provide access sleeves through walls above ceilings to provide continuous pathway to Telephone Board). 3/4" C. for one outlet, 1" C. for two (maximum per home run). See Section 16100. Service entrance - 2 inch diameter PVC Sch. 40 with 200# nylon pull rope.
 - 3. Boxes: See Section 16100.
 - 4. Power: Provide power to the telephone equipment as shown.
 - 5. Mounting Board: 3/4" x 2'(W) x 8'(H) sheets of plywood (fire-rated, A/B Grade) as shown in the MDF room, painted with two coats of non-flammable gray paint.
 - 6. The Electrical Contract shall provide a #6 bare wire copper grounding conductor to the telephone entrance point, and MDF ground bus, from main building ground bus.
 - 7. Provide ground bus in MDF. Chatsworth #19622-010. (Pre-drilled with stand offs).
 - 8. Provide #6 ground conductor from MDF ground bus to each telephone or data rack and telephone switch.

END OF SECTION 260700

SECTION 262417 - SERVICE AND DISTRIBUTION

PART 1 - GENERAL

1.1 GENERAL

- A. General Conditions and General Requirements as listed in Index to Specifications apply to work under this Section.

1.2 WORK DIVISION

- A. Utility Company: Provision, installation, connection and energization of all primary cables, pole mounted transformer, secondary conductors and meter.
- B. Electrical Contractor: Provision, installation, connection and energization of all systems from the point of utility service to and including the building and site work. Provision and installation of all trenching, backfilling, and secondary conduit. Refer to the drawings.

PART 2 - PRODUCTS

2.1 CONDUITS

- A. Underground Feeder: Schedule 40 PVC with long sweep rigid steel elbows wrapped with Scotch #51 tape.
- B. Above Grade Feeders: Rigid galvanized steel or EMT. Refer to Section 16100 for conduit usage.

2.2 CONDUCTORS

- A. Feeders: Stranded copper sized as shown on the drawings (substituted aluminum shall have equal ampacity).

2.3 SERVICE ENTRANCE EQUIPMENT AND METERING

- A. Requirements: Provide service entrance meter base for building service. Consult Electrical Drawings for details and equipment arrangements.

2.4 LOADCENTERS

- A. Cabinets: Code gauge galvanized or pickled steel with factory finish of baked enamel or lacquer. For surface or flush mounting as shown. Dead front safety type. Hinged doors with keyed alike locks, with lift latch for opening. Boxes shall be 3-3/4 inches deep by 14 inches wide by length as required.
- B. Bus Work: Hard drawn copper for all panelboards. Wire terminals shall be compression type with non-oxide conductive paste for accepting aluminum conductors.
- C. Future Provision: Where "space" or provision is called for, provide all necessary hardware so the spare is ready to accept circuit breaker (or switch as applicable) without additional hardware.
- D. Circuit Breakers: Common trip, single handle. Minimum AIC ratings shall be 10,000 amps at 240 volts.
 - 1. General Use: Molded case, thermal magnetic, amperage and poles as indicated in Panel Schedules.
 - 2. HACR Type Circuit Breakers: Provide HACR rated circuit breakers on all heat pump and air conditioner branch circuits.
 - 3. Appliance Circuit Lock-offs: Provide padlock lockable circuit breaker handle lock-offs for all circuits serving permanently installed appliances over 300VA or 1/8 hp per NEC 422-21.
- E. Loadcenters Types:
 - 1. 200 amperes or less: Square D QO (250V), or equal.
- F. Labeling: Label all circuits showing load served in Panelboard Schedule. Typewritten only. Panel Schedules shall reflect final room names, not names shown on plans. Provide permanent lamicaid label on Panel.
- G. Manufacture: Square D, G.E., Siemens, Cutler-Hammer/Westinghouse. Mount panelboards with top up 6'-6" and anchor securely to building structure.

PART 3 - EXECUTION

3.1 TRENCHING

- A. Provide trenching, backfill and compacting for all secondary and telephone service. See drawings for details. Depth of trenching is relative to final grade.

3.2 SERVICES

- A. Secondary and telephone services to the building shall be underground.

3.3 BRANCH CIRCUIT

- A. All branch circuits shall be run concealed where possible.
- B. In general, branch circuits shall contain two phases and a neutral for 120/240 volt single phase, three wire systems. Branch circuits shall be on opposite phases to balance neutral loads.
- C. Home runs shall conform to the following:
 - 1. 120/240 volt circuits where fixed load is more than 1000 watts and run is more than 50 feet, minimum wire size shall be #10 AWG copper.
- D. Extend the branch circuit from the panelboard to the disconnect, mount the starter and wire through to the final connection of the apparatus to be connected.

3.4 LOW VOLTAGE CABLES (70 VOLTS OR LESS)

- A. In inaccessible, concealed spaces run cables in raceway. In accessible, unfinished areas cables may be run exposed without raceway.
- B. Run exposed cables parallel to or at right angles to building structure lines. Do not run exposed cables on floors or in such a way that they obstruct access to, operation of, or servicing of equipment. Keep cables 6 inches minimum from hot water pipes.
- C. Support cables every 3 feet with permanent clips, straps, staples, or tie wraps approved for application and which will not cause cables to be pinched or deformed.
- D. Securely attach clips and straps with nails or screws. Do not use wire or tape to support cables.
- E. Bundle only cables of same systems together.

3.5 CONTROL WIRING

- A. Provide all control wiring associated with equipment or systems provided and included as part of this Division. Unless specifically indicated, control wiring associated with the function and control of heating, ventilating, exhaust, hydronic pumping, water heating equipment or operation of dampers or similar is not covered under this Division.

3.6 RECEPTACLES

- A. Provide the correct type and style of receptacle for phase and voltage of device to be plugged in.

3.7 ACCESS PROVISION

- A. Panels: Provide 4 - 3/4" and 2 - 1" spare conduits stubbed up from each flush mounted (recessed in wall) branch circuit panel to accessible ceiling space, or attic space if hard ceiling.

- B. Walls: Where required for passage of open wiring provide conduit sleeves through walls, 50% spare capacity minimum.

3.8 EQUIPMENT PROVIDED BY OTHERS

- A. It shall be the responsibility of the Electrical Contractor to verify nameplate data on all Mechanical Equipment prior to rough-in. Where direct connection is to be made to equipment, provide code disconnect as required. Provide all disconnects as indicated on drawings.
 - 1. Provide fusible disconnects for refrigeration and/or air conditioning compressor motors, motors without overload protection, and as specified or shown on the drawings.
 - 2. Provide non-fuse disconnects for motors having overload protection, equipment not in site of panelboards, or as required otherwise by code authority.
 - 3. Starters shall be furnished by others and installed under Division 16 work unless specified otherwise.

END OF SECTION 262417

SECTION 265100 - LIGHTING FIXTURES

PART 1 - GENERAL

1.1 GENERAL

- A. General Conditions and General Requirements as listed in Index to Specifications apply to work under this Section.
- B. Provide new lighting fixtures typical in each location of type indicated. Provide with new lamps of wattage as shown. Letter designates fixture type. UL approved.
- C. All exterior lighting fixtures shall be UL approved for wet/damp locations and bear the label.

PART 2 - PRODUCTS

2.1 BALLASTS

- A. Voltage: All ballasts and drivers shall be 120 volts for both interior and exterior lighting fixtures unless noted otherwise.
- B. Led: Refer to individual fixture specifications for drivers.
- C. Execution: Factory installed in lighting fixtures where possible. All ballasts shall be easily accessible for service and maintenance.

2.2 LAMPS

- A. Incandescent Lamps: 130 volt, pear shaped, medium base, inside frosted, 2000 hour.
- B. Led Lamps: Refer to individual fixture specifications for LED lamps.
- C. Execution: All incandescent lamps shall be new at time building is turned over to the Owner. All lamps shall be new when installed. They shall arrive at the jobsite in new, unbroken cases and be installed in fixtures after mounting. All lamps shall be wiped free of construction dust at completion of the project.

2.3 EMERGENCY BATTERY INVERTER UNITS

- A. LED Lamps: Provide a 1400 lumens minimum unit mounted inside driver compartment. Wire to switch protected lamps with normal power lamps. Lithonia PS1400, Bodine B50, or as approved.

2.4 LIGHTING FIXTURES

- A. Sheet Metal: Minimum 22 gauge cold rolled steel. Fixture bodies shall be rigidly formed to prevent warping or twisting. All metal surfaces shall be thoroughly treated, phosphatized, prime coated and finished. All metal surfaces shall be completely covered with finish coat of baked enamel so that no prime coating or raw metal shows through on any surface. Trim finishes shall be as specified with no scratches, damaged surfaces and clean at the time of acceptance.
- B. Lenses and Diffusers: As specified glass or 100% acrylic. At time of acceptance, all shall be new with no scratches, chips, cracks or splits. LED fixture lenses shall not be less than .125" in thickness.

2.5 LIGHTING FIXTURE SCHEDULE

- A. Type A: 2' X 4' two lamp fluorescent layin troffers, T8 lamps. Lithonia #2GT8 232 A12125 MVOLT GEB10RS LP835 or equal in Day-Brite, Ligholier, Columbia, Metalux, HEWilliams or as approved. (62 VA)
- B. Type AE: Same as TYPE A, except with a one lamp emergency battery inverter unit, 1400 lumens.
- C. Type A3: Same as TYPE A, except with three lamps. (93 VA)
- D. Type B: 48" long, surface mounted fluorescent fixture with Acrylic diffuser. Lithonia #WC 232 A12 MVOLT GEB10PS or equal in Day-Brite, Ligholier, Columbia, Metalux, HEWilliams or as approved. (62 VA)
- E. Type C: 6" round fluorescent downlight. Lithonia #LF6N 1/32TRT MVOLT F601AZ or equal in Capri, Prescolite, Lightolier, Halo, Indy, or as approved. (33VA)
- F. Type D: 48" long, surface mounted, undercounter fluorescent, TERON-OF HUC348 MVOLT S1 GEB10RS GW or equal in Day-Brite, Ligholier, Columbia, Metalux, HEWilliams or as approved.
- G. Type F8: 96" long fluorescent with two T8 lamps per 48", with wire guard. Lithonia #TC 232 MVOLT GEB10PS CH CUNWG or equal in Day-Brite, Ligholier, Columbia, Metalux, HEWilliams or as approved. (124 VA).
- H. Type G: Surface mounted, 13" round rough service fluorescent fixture with open face. White finish, two 42 watt TRT lamps. LUMINAIRE #ARV13HO 2PLT42 120 CP WHT, or as approved. (86VA)
- I. Type GE: Surface mounted, 13" round rough service fluorescent fixture with open face. White finish, two 42 watt TRT lamps, emergency battery unit. LUMINAIRE #ARV13HO 2PLT42 120 CP WHT EMB94, or as approved. (86VA)

- J. Type H: Surface mounted, 48" long, fluorescent wraparound, two T8 lamps. Lithonia #LB 232 MVOLT GEB10PS or equal in Day-Brite, Ligholier, Columbia, Metalux, HEWilliams or as approved. (124 VA)
- K. Type J: Wall mounted vandal resistant fluorescent. Lithonia #VR1B 32RT MVOLTT LPI or as approved. (33 VA)
- L. Type X: LED exit sign with battery back up and LED lamp heads. White Thermoplastic finish. Lithonia #LHQM LED R HO SD or as approved.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Recessed lighting fixtures shall be set parallel to building lines, flush, aligned, with no light leaks. Where they are set in suspended ceilings, plaster or tile rings shall be provided and fixtures shall be connected to junction boxes with 60 inches of flexible conduit. Junction boxes shall be set away from opening to allow fixture to be dropped out. See details on drawings. Coordinate with ceiling diffusers and sprinkler head.
- B. Fixtures run in continuous rows shall be mounted at a uniform height unless shown otherwise. Align both horizontally and vertically.

3.2 ANCHORING AND SUSPENDING

- A. Recessed fluorescent fixtures installed in suspended ceilings shall be supported independent of the ceiling system by the Electrical Contractor. Provide and install #12 iron wire from two opposite corners of the fixture to the building structure. Install four seismic clips in addition to the wire supports.
- B. Surface mounted fixtures shall be anchored to or supported from outlined members or from bridging between structural members as outlined above. Anchors shall conform to specified types found in other sections of this Specification. Provide ceiling spacers as required.
- C. All anchors shall support the weight of the fixture plus 150 lbs.
- D. All building bracket type fixtures shall be securely mounted to outlet boxes or secured to buildings with approved anchors.
- E. The surfaces of all fixtures and lenses, interior and exterior, shall be wiped free of construction dust at the completion of the project.
- F. Noisy Ballast: Replace any and all ballasts (fluorescent or H.I.D.) deemed excessively noisy by the Architect at no additional cost to the Contract.

3.3 CONTROL OF EXTERIOR LIGHTING

- A. Control exterior lighting with lighting contactor, time clock and photo-electric cell.
- B. Install time clock and contactor inside building adjacent to serving panel to control exterior lighting.
- C. Locate photo cell outside building under soffit and away from any light source and direct sunlight. Wire photo cell and time clock in series to control lighting contactor for photo cell "ON" and time clock "OFF" operation.

END OF SECTION 265100

SECTION 311100 - CLEARING AND GRUBBING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Basics: Drawings are general provisions of contract, including General and Supplemental Conditions and other Division – 1 Specification Sections, apply to this section
 - 1. In the event of a conflict in these specifications or related documentation for the project, the most stringent or that specification as directed by the authority having oversight shall dictate.

1.2 DESCRIPTION OF WORK

- A. Work specified in this section includes, but is not necessarily limited to the following:
 - 1. Removing obstructions within the clearing limits indicated on the drawings.
 - 2. Removing and disposing of vegetation or other unwanted materials from the ground surface.
 - 3. Grubbing: Removing and disposing of such materials from below the ground surface.
 - 4. Stockpile materials at site.
 - 5. Protecting from harm any trees or other objects selected to remain.

1.3 SUBMITTALS

- A. Demolition procedures and operational sequence for review and acceptance by the Owner's Representative. Include:
 - 1. Permits for transport and disposal of debris shall be provided by the Contractor at no additional cost to the Owner.
 - 2. Record drawings indicating locations of remaining utility lines and related appurtenances, in accordance with Section 017700.

1.4 QUALITY ASSURANCE

- A. Special Requirements of Regulatory Agencies:
 - 1. See referenced codes and ordinances.
 - a. Pacific County having jurisdiction.
 - b. Comply with all governing requirements and regulations.

1.5 EXISTING CONDITIONS

- A. Protection of Existing Improvements: In accordance with the following:
 - 1. Provide, erect and maintain barricades, coverings, or other types of protection necessary to prevent damage to existing objects indicated to remain in place. Restore any improvements damaged by this work to their original condition, as acceptable to Owner.
- B. Protection of Existing Utilities: In accordance with the following:
 - 1. Do not shut off or cap utilities without prior notice. Coordinate work with Division 01 requirements.
- C. Objectionable Noises: Limit use of air hammers and other noisy equipment as much as possible. Confirm with local governing requirements regarding Noise Control.
- D. Maintain vehicular and Pedestrian traffic routes:
 - 1. Ensure minimum interference with streets, parking lots, and adjacent facilities.
 - 2. Do not close or obstruct streets, sidewalks, or passageways without permission from authorities having jurisdiction.
 - 3. Ensure compliance with all city requirements for traffic control, such as flaggers, temporary lane delineation, etc.

1.6 SEQUENCING / SCHEDULING

- A. Prior to commencing work on the project, the Contractor shall submit to the Owner's Representative for review, a complete construction schedule detailing the order in which the work will proceed together with an estimated time schedule.

1.7 DIMENSION AND LAYOUT

- A. The contractor shall be responsible for furnishing, setting, and marking all line, grade, and location stakes, including off-sets and general construction staking, together with clearing limits.
- B. There shall be on site at all times when work requiring control is being performed all necessary equipment, supplies, and instruments related thereto. A qualified layout engineer, surveyor, or technical specialist must be assigned to the Contractor's crew for this work. This equipment and personnel must be available at no additional cost to the Owner for the purpose of verifying layout and certifying the accuracy of work on site.
- C. All work, materials, methods, and personnel shall be subject to approval by the Owner's Representative prior to commencing construction and on a continuing basis for each stage requiring accuracy control.
- D. The Contractor is responsible for preserving all benchmarks and stakes and replacing any that are displaced or missing as a result of the Contractor's operation.

- E. The Contractor is responsible for review of all Owner and city records relative to the existing underground facilities. The Contractor is responsible to avoid damaging these facilities and shall repair all recorded utilities at no additional cost to the Owner.
- F. The Contractor is to notify the Owner's Representative immediately of underground utilities encountered which are not shown on the Owner's record.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that clearing and grubbing and site improvement removal may safely and appropriately begin.
- B. Obtain required permits and permission from local governing authorities and Owner prior to commencing work.

3.2 CLEARING

- A. Remove grown and underbrush as required for new construction and as indicated on the plans. Removal operations shall be performed in a manner to protect property.
 - 1. Cut stumps and other growth with or below original grade surface.
 - 2. Completely remove all growth.

3.3 GRUBBING

- A. General: Grub or otherwise prepare areas where clearing has occurred to receive construction or other improvements.
 - 1. Excavate and remove all stumps to a depth of three (3) feet below grade.
 - 2. Excavate and remove roots larger than one and a half (1 ½) inches in diameter, rocks, boulders, any remaining paving, as well as other unsuitable materials.
 - 3. Areas to be occupied by building or other construction: Excavate these materials to not less than depth indicated on plans.
 - a. Other areas:
 - 1) Not less than twelve(12) inches below existing grade at asphalt paving.
 - 2) Not less than eight (8) inches below existing grade landscaped areas.

3.4 SITE IMPROVEMENT REMOVALS

- A. Sprinkle debris as necessary to limit dust to lowest practicable level. Do not use water to extent causing flooding, contaminated runoff or icing.
- B. Utilities: Cap and remove all piping designated for removal, including underground piping and exposed piping.
 - 1. Piping: Some utility piping and structures are to remain in operation and shall be protected during construction. Damage to existing utilities, which are to remain, shall be repaired at the Contractor's expense.
 - 2. In the event the Contractor encounters utility lines not shown on the site plan or otherwise indicated to be saved, removed, or abandoned, the location of such lines shall be marked in the field and the Owner's Representative notified

3.5 DISPOSAL OF MATERIALS

- A. The excess refuse resulting from clearing and grubbing shall be disposed of by the Contractor in a manner consistent with all government regulations.
 - 1. No burning permitted
 - 2. Do not leave refuse material on the project site, shoved onto abutting properties, or buried in embankments or trenches on the project site.
 - 3. Do not deposit debris in any stream or body of water, or in any street or alley, or upon any private property except by written consent of the private property owner.
 - 4. Maintain hauling routes clean and free of any debris resulting from work in this Section.

3.6 CLEAN-UP

- A. Upon completion of the work of this Section, remove all rubbish, trash, and debris resulting from operations.
- B. Remove equipment and tools; leave the site in a neat and orderly condition acceptable to the Owner's Representative.

END OF SECTION 311100

SECTION 311300 - SELECTIVE TREE AND SHRUB REMOVAL

PART 1 - GENERAL

1.1 SCOPE

- A. Work includes the felling or removal by tree spade of trees or larger shrubs designated in the contract to be removed from the project site, and related work as indicated in the drawings.

1.2 RELATED WORK

- A. Applicable provisions of Division 1 shall govern all work under this section.

1.3 DEFINITIONS

- A. Caliper: Diameter of a trunk measured by a diameter tape at 4'-6" above the ground or DBH (diameter at breast height). (Standard as defined by the ISA – International Society for Arboriculture).
- B. Arborist or Certified Arborist: As referenced here in all "arborists" or "certified arborists" shall be at minimum an ISA Certified Arborist or and ASCA Registered Consulting Arborist unless other specified.

1.4 QUALITY ASSURANCE

- A. Tree Pruning Standard: Comply with ANSI A300 Pruning Standards.
- B. Oak Wilt Prevention: Wisconsin Department of Natural Resources Forestry Division Publication PUB-FR-127 2009.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- A. Mechanical diggers shall be in good operating condition, with properly aligned, sharpened and damage-free blades. Hydraulic systems shall be free of leaks.

- B. For trees up to 10" (25.4 cm) caliper, the tree spade size used should allow a minimum root area equivalent of 9-10" (22.9-25.4 cm) of soil per inch of trunk diameter. (Example: A 4" caliper tree should be dug with a 40" tree spade.)

3.2 FELLING

- A. Fell trees to prevent damage to adjacent structures and to those trees and shrubs designated to remain. Remove stumps and roots to a clear depth of 36" (0.9 m) below existing grades in areas of lawn, and to full depth in areas of paving, building footings, or utility structures.

3.3 PRUNING

- A. Only those branches of existing trees that interfere in some way with the Contractor's operations or with the spading operation are to be pruned.
- B. Pruning shall be performed by a certified arborist. Prune trees over winter, between the months of November and March. Trees may be pruned at other times of the year, provided that the Contractor submits to the owner for acceptance a scheduled time, and a description of pruning methods and materials.
- C. Prune trees according to ANSI A300 Pruning Standards.
- D. To prevent Oak wilt, do not prune, cut or injure Oaks between April 1 and July 31. If an Oak is wounded during this period, cover the wound immediately with tree wound paint (water-based paint). During the lower risk period between July and October 31 covering wound is optional. November through March is the preferred period for pruning and tree removal. Refer to Wisconsin Department of Natural Resources Forestry Division Publication PUB-FR-127 2009 for further Oak tree protection requirements.
- E. Where necessary, repairs to damaged wood shall be performed under the direction of the Owner, or a certified arborist.
- F. Evergreens shall only be pruned to remove dead, broken or damaged branches.
- G. Perform pruning using scissors-style cutting devices, and not anvil-style hand pruners, pole pruners or loppers.

3.4 DIGGING

- A. To minimize soil compaction, damage from tires, etc., the Contractor shall lay down wood planking as surface protection during tree spade operations.
- B. In preparing a tree for removal by tree spade, branches are to be tied up or down to allow access by spade. Presoaking the area around the tree for 24-48 hours prior to removal is advisable. Two to three hours prior to transplanting spray tree to run-off with an approved anti-transpirant at a 1:10 dilution rate.

- C. Remove weeds and excess topsoil from the root ball prior to removal. Match the size of the root ball with the hole dug for transplanting.
- D. Spade blades are to be dropped one at a time, alternating one side with the other to ensure even penetration. After lifting tree, cut any roots protruding from spades with sharp hand tools.

3.5 TRANSPORT

- A. Prior to transporting, wrap tarp around both the upper portion of tree to prevent moisture loss from leaves and stems and around the bottom of the root ball.

3.6 CLEANING

- A. All trimmed branches and other debris shall be removed from the site by the Contractor at the end of each work day.

END OF SECTION 311100

SECTION 312000 - EARTH MOVING

PART 1 - GENERAL

1.1 GENERAL

- A. Excavate, backfill, compact and grade the site to the elevations shown on the Drawings as specified herein.
- B. Use equipment adequate in size, capacity, and numbers to accomplish the work of this Section in a timely manner.
- C. Comply with requirements of governmental agencies having jurisdiction.

PART 2 - MATERIALS

2.1 MATERIALS

- A. For fill at structure and paved areas, provide clean crushed gravel baserock.
- B. Fill surrounding lawn and planting areas with mix of existing surface soil and imported topsoil - pH 5.5 to 7.0, 4% organic material, free of stones 1" or larger or any other material harmful to plant growth.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Barricade open holes and depressions occurring as part of work. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, washout and other hazards created by the operations.
- B. Excavate to a distance below grade as directed by Contract Documents.
- C. Excavate and backfill in a manner and sequence that will provide proper drainage at all times.

3.2 FILLING AND BACKFILLING

- A. Backfill excavations as promptly as progress of the work permits, but not until completing the following:
 - 1. Inspecting, testing, approving and recording locations of underground utilities.
 - 2. Removing concrete form work.

3. Removing trash and debris.

- B. Remove vegetation, debris, unsatisfactory soil materials, obstructions and deleterious materials from ground surface prior to fill.

3.3 GRADING

- A. Compact with uniform levels or slopes between points where elevations are shown on Drawings.
- B. Grade areas adjacent to buildings to achieve drainage away from the structures and to prevent ponding.

3.4 COMPACTING

- A. Provide not less than the following maximum density of soil material compacted at optimum moisture content for the actual density of each layer of soil material in place:
1. Structure areas: 95% of maximum density.
 2. Pavement areas: 90% of maximum density.

END OF SECTION 312000

SECTION 312500 - EROSION CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Basics: Drawings and general provision of contract, including General and Supplemental Conditions and other Division – 1 Specification Sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. General: The Contractor will construct temporary erosion control structures as shown on the plans and specifications.

1.3 SUBMITTALS

- A. Silt Fence: The Contractor will submit manufacturer's data on the silt fence system to the Architect prior to ordering materials.

PART 2 - PRODUCTS

2.1 SILT SACKS

- A. Silt sacks material shall be made of highly permeable woven monofilament and non-woven needle punched geotextiles.

2.2 SILT FENCE

- A. Silt Fence system shall be the "Envirofence" silt system manufactured by Mirafi, Inc., or equal. The height of a silt fence shall not exceed 36 inches (higher fence may impound volumes of water sufficient to cause failure of the structure).

PART 3 - EXECUTION

3.1 GENERAL

- A. All erosion control products and materials will be installed in accordance with the manufacturer's recommendations and as shown on the plans. All erosion control measures shall be left in place until all reseeding efforts are completed and vegetation has taken root, or as directed by Owner's Representative.

3.2 INSTALLATION

- A. Silt sacks shall be placed in all catch basins.
- B. Silt Fences: The filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid the use of joints. Where joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum of 6 inch overlap, and securely sealed. Posts shall be spaced a maximum of 10 feet apart at the barrier location and driven securely into the ground (minimum of 24 inches). A trench shall be excavated approximately 6" (wide) x 6" (deep) along the line of the posts and upslope from the barrier. The trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently seeded and stabilized.

3.3 MAINTENANCE

- A. Maintenance of Silt Sacks: When flow has been impeded or after every storm event, silt sacks shall be monitored and replaced as necessary.
- B. Maintenance of Silt Fences: Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall by the contractor. Any required repairs shall be made immediately by the Contractor. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximately 1/3 the height of the barrier.

3.4 REMOVAL

- A. Removal of Erosion Control Structures: Any material remaining in place after the fence or barrier is no longer required shall be graded to conform to the existing grade and reseeded.

END OF SECTION 312500

SECTION 321216 - ASPHALT PAVING

PART 1 - PAVING

1.1 WORK INCLUDED

- A. Provide asphaltic concrete paving where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

PART 2 - PAVING PRODUCTS

2.1 AGGREGATES

- A. Provide aggregates consisting of crushed stone, gravel, sand, or other sound, durable, mineral materials processed and blended, and naturally combined.
- B. Subbase aggregate maximum size: 1 - 1-1/2".
- C. Base aggregate maximum size:
 - 1. Base courses over 6" thick: 1 - 1-1/2".
 - 2. Other base courses: 3/4".
- D. Aggregates for asphaltic concrete paving: Provide a mixture of sand, mineral aggregate, and liquid asphalt mixed in such proportions that the percentage by weight will be within:

Sieve sizes:	Percentage passing:	
3/4"	100%	
3/8"	67	- 85%
1/4"	50	- 65%
No. 8 mesh	37	- 50%
No. 30 mesh	15	- 25%
No. 200 mesh	3	- 8%

plus 50/60 penetration liquid asphalt at 5% to 6-1/2% of the combined dry aggregates.

2.2 WEED KILLER

- A. Provide a dry, free-flowing, dust-free chemical compound containing not less than 30% sodium chlorate or a chlorate-borate compound, non-flammable, not creating a fire hazard when applied in accordance with the manufacturer's recommendations, soluble in water, and capable of being spread dry or in solution.
- B. Acceptable products:
 - 1. "Chlorax 40": Chipman Chemical Co., Inc., Palo Alto, CA.
 - 2. "Monobar-Chlorate": U.S. Borax and Chemical Corp., Los Angeles, CA.

2.3 HEADERS AND STAKES

- A. Provide construction grade, in dimensions shown on the Drawings or as required for the use where dimensions are not shown on the Drawings.

2.4 ASPHALTS

- A. Comply with provisions of Asphalt Institute Specification SS-2:
 - 1. Asphalt cement: Penetration grade 50/60.
 - 2. Prime coat: None.
 - 3. Tack coat: Uniformly emulsified, grade SS-1H.

2.5 SEALER

- A. Provide a sealer consisting of suitable fibrated chemical type asphalt base binders and fillers having a container consistency suitable for troweling after thorough stirring, and containing no clay or other deleterious substance.
- B. Acceptable products:
 - 1. "Laycold Walk Top": Chevron Asphalt Co., San Pedro, CA.

2.6 MIXING ASPHALTIC MATERIALS

- A. Provide hot plant mixed asphaltic concrete paving materials.
 - 1. Temperature leaving the plant: 290 degrees F minimum, 320 degrees F maximum.
 - 2. Temperature at time of placing: 280 degrees F minimum.

2.7 BASE ROCK

- A. Base course: 4" layer of 2-1/2" - C.G.

- B. Top course: 2" layer of 3/4" - C.G.

PART 3 - PLACEMENT OF BASE COURSES

3.1 PLACEMENT

- A. Subbase (when required):
 - 1. Spread the specified subbase materials to a thickness providing the compacted thickness noted in this specification.
 - 2. Compact to 95%.
- B. Base:
 - 1. Spread the specified base material to a thickness providing the compacted thickness noted in this specification.
 - 2. Compact to 95%.
- C. Thickness tolerance: Provide the compacted thicknesses shown on the Drawings within a tolerance of minus 0.0" to plus 0.5".
- D. Smoothness tolerance: Provide the lines and grades shown on the Drawings within a tolerance of 3/8" in ten feet.
 - 1. Deviations: Correct by removing materials, replacing with new materials, and reworking or recompacting as required.

3.2 PLACEMENT OF ASPHALTIC CONCRETE PAVING

- A. Install the specified headers and stakes to achieve the arrangement of paving shown on the Drawings.
- B. Remove all loose materials from the compacted based.
- C. Apply the specified prime coat, and tack coat where required, and allow to dry, in accordance with the manufacturer's recommendations as approved by the Architect.
- D. Adjust frames and covers, if so required, to meet final grades.
- E. Receipt of asphaltic concrete materials:
 - 1. Do not accept material unless it is covered with a tarpaulin until unloaded, and unless the material has a temperature of not less than 280 degrees F.
 - 2. Do not commence placement of asphaltic concrete materials when the atmospheric temperature is below 50 degrees F, nor during fog, rain, or other unsuitable conditions.
- F. Spreading

1. Spread material in a manner which requires the least handling.
2. Where thickness of finished paving will be 3" or less, spread in one layer.

G. Rolling

1. After the material has been spread to the proper depth, roll until the surface is hard, smooth, unyielding, and true to the thickness and elevations shown on the Drawings.
2. Roll in at least two directions until no roller marks are visible.
3. Finished paving smoothness tolerances:
 - a. Free from birdbaths.
 - b. No deviations greater than 1/8" in six feet.

3.3 FLOOD TEST

- A. Prior to application of seal coat, perform a flood test in the presence of the Architect.
- B. Method:
 1. Flood the entire asphaltic concrete paved area with water by use of a tank truck or hoses.
 2. If a depression is found where water ponds to a depth of more than 1/8" in six feet, fill or otherwise correct to provide proper drainage.
 3. Feather and smooth the edges of fill so that the joint between fill and original surface is invisible.

3.4 APPLICATION OF SEAL COAT

- A. Prepare the surfaces, mix the seal coat materials, and apply in accordance with the manufacturer's recommendations as approved by the Architect.
- B. Apply one coat of the specified sealer.
- C. Achieve a finished surface seal which, when dry and thoroughly set, is smooth, tough, resilient, of uniform black color, and free from coarse textured areas, lap marks, ridges, and other surface irregularities.

3.5 PROTECTION

- A. Protect the asphaltic concrete paved areas from traffic until the sealer is set and cured and does not pick up under foot or wheeled traffic.

PART 4 - PAVEMENT MARKING

4.1 WORK INCLUDED

- A. Provide pavement marking in the types and arrangements shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

4.2 RELATED WORK

- A. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

PART 5 - PAVEMENT MARKING PRODUCTS

5.1 GENERAL

- A. Provide paint specifically formulated for use as pavement marking in automobile traffic areas, and in the colors selected by the Architect from standard colors of the approved manufacturer.
- B. Acceptable products:
 - 1. "Traffic Paint" manufactured by J.E. Bauer Co.
 - 2. "Traffic Paint" manufactured by Tnemec.
 - 3. "Romark Traffic" manufactured by Glidden-Durkee.
 - 4. "Traffic and Zone Marking Paint" manufactured by PPG.

5.2 APPLICATION

- A. Secure the Architect's approval of graphics design and layout prior to start of application.
- B. Using proper masking, stencils, and application equipment recommended for the purpose by the manufacturer of the approved paint, apply the approved paint in strict accordance with its manufacturer's recommendations.

5.3 PROTECTION

- A. Provide traffic cones, barricades, and other devices needed to protect the paint until it is sufficiently dry to withstand traffic.

5.4 CLEANUP

- A. When paint is thoroughly dry, visually inspect the entire application and:
 - 1. Touchup as required to provide clean, straight lines and surfaces throughout.

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

END OF SECTION 321216

SECTION 321713 - PARKING BUMPERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes wheel stops.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 PARKING BUMPERS

- A. Concrete Wheel Stops: Precast, steel-reinforced, air-entrained concrete, 4000-psi minimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long. Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or -drilled vertical holes through wheel stop for anchoring to substrate.
 - 1. Mounting Hardware: Galvanized-steel hardware as standard with wheel-stop manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install wheel stops according to manufacturer's written instructions unless otherwise indicated.
- B. Securely anchor wheel stops to pavement with hardware in each preformed vertical hole in wheel stop as recommended in writing by manufacturer.

END OF SECTION 321713

SECTION 321723 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Basics: Drawings and general provisions of contract, including General and Supplemental conditions and other Division – 1 Specification Sections, apply to this section.

1.2 DESCRIPTION OF WORK

- A. Work specified in this Section includes, but is not necessarily limited to the following:
 - 1. All work necessary for furnishing and installing striping and pavement markings.

PART 2 - PRODUCTS

2.1 PAINT

- A. Paint for both striping and markings shall be the alkyd resin type, ready mixed white, Type I, conforming to the requirement of AASHTO M248.

PART 3 - EXECUTION

3.1 GENERAL

- A. The Contractor will be responsible for preliminary spotting of the lines and markings to be painted and approval of the Engineer must be obtained before pavement markings may begin. The area to be painted shall be dry, clean and free of loose particles. The paint machine shall be of the type capable of satisfactorily applying the paint under pressure with a uniformity of feed through nozzles spraying directly upon the pavement.

3.2 PAINT

- A. Striping paint shall be thoroughly mixed prior to application and shall be applied when the air temperature is above 40° F. The rate of application shall not exceed 80 square feet per gallon (approximately 20 mils wet thickness). This rate is effectively 20 gallons of paint per mile of four (4) inch wide solid stripes. For narrower or wider striping or other marking, paint shall be applied at a proportional rate with the four (4) inch stripes.

END OF SECTION 321723

Bid/Construction Set
06/01/15

New Office and Facilities Building for
North Beach Water District
Ocean Park, Washington

SECTION 334400 - STORM DRAINAGE AND DOWNSPOUTS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Provide drainage systems where shown on Drawings and as specified herein, complete in place, tested and approved.

1.2 MATERIALS

- A. Drainlines: PVC 30-34 gasketed sewer pipe under paving, PVC DF elsewhere. Use proper matching fittings, complying with ASTM D2466.
- B. For joining, use a solvent complying with ASTM.

1.3 EXECUTION

- A. Carefully inspect pipe and fittings before installation, removing all dirt, scale and burrs. Ream as required.
- B. Trench, backfill and compact in accordance with Division 02.
- C. Layout the piping system in accordance with arrangement shown on the Drawings. Provide slope for proper drainage.
- D. In joining, use only specified solvent and make joints in accordance with manufacturer's recommendations.
- E. Before backfilling mainline, water test for leakage and repair any leak discovered.
- F. Replace or repair paving as required.

END OF SECTION 334400