CITY OF KIRKLAND
Juanita Beach Park Bathhouse
CIP NO. PKC 0119 100
JOB NO. 51-19-PW
9703 NE Juanita Drive, Kirkland, WA 98034

PROJECT MANUAL

September 30, 2019
CITY OF KIRKLAND
DEPARTMENT OF PUBLIC WORKS

JUANITA BEACH PARK BATHHOUSE REPLACEMENT PROJECT
CIP NO. PKC 0119 100
JOB NO. 51-19-PW

Approved for Construction:

[Signature]

Rod Steitzer, P.E.
Capital Projects Manager
Certification of Technical Specifications:
Technical Specifications in this project manual have been prepared by or under the direction of the design professional, licensed to practice in the State of Washington, whose initials appear opposite the Specification Division or Section in the Table of Contents. Stamps, names and initials of the design professional are as follows:

NAME
INITIALS

8425
CHRISTOPHER C. PATANO
REGISTERED ARCHITECT
STATE OF WASHINGTON

9.30.19
CITY OF KIRKLAND
JUANITA BEACH PARK BATHHOUSE

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09/30/19
CITY OF KIRKLAND
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10/2/2019

09/30/19
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<tr>
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<td>JW</td>
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John (sign)
10/2/19

09/30/19
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The City of Kirkland invites interested and qualified contractors to submit sealed bids for the following project:

**TITLE:** Juanita Beach Park Bathhouse

**ESTIMATED BID AMOUNT:** Approximately $2.5M including sales tax

**BID SUBMITTAL TIME/DATE/LOCATION:** Prior to 2:00 P.M. on 15 November 2019 at City of Kirkland 123 5th Avenue Kirkland WA 98033

**PUBLIC BID OPENING**

Public Bid Opening will commence at approximately 2:00 P.M. in Council Chambers, Kirkland City Hall, 123 Fifth Avenue, Kirkland, WA, 98033

**PRE-BID CONFERENCE**

10:00 A.M. on 5 NOV 2019 at 9703 NE Juanita Drive Kirkland, WA 98034

Attendance at the pre-bid conferences and site-walk through is highly encouraged but is not mandatory.

**BID SUBMITTAL ENVELOPE:**

Upon submittal, bids will be recorded by the City of Kirkland as to time and date received, and secured, until the time set for the public bid opening. All bid submittal envelopes must be plainly marked on the outside with “Bid Proposal, Juanita Beach Park Bathhouse, Job # 51-19-PW.” NO PROPOSALS WILL BE ACCEPTED AFTER THE BID SUBMITTAL TIME.

**ITEM FOR BID:**

The project consists of all work to be performed as indicated in the Project Manual and Drawings. The work consists of furnishing all labor, materials, and other incidentals for the construction of a new 3,030 square foot bathhouse facility with utilities, site work, and playground. The project also includes two 920
square foot picnic pavilions. The project is subject to the Project Manual and Drawings and any posted addenda.

The work, to be substantially completed within 195 calendar days from the notice to proceed.

**BID DOCUMENTS:**

The Project Manual, Drawings, and any Addenda may be viewed and obtained from Builders Exchange of Washington, [www.bxwa.com](http://www.bxwa.com) within the posted projects section for the City of Kirkland. It is recommended that Bidders “Register” in order to receive automatic e-mail notification of future addenda and to place themselves on the “Self-Registered Bidders List.” Bidders who do not register will not be automatically notified of addenda and will need to periodically check the posted projects section for addenda issues on this project.

Questions regarding this project shall be submitted in writing to Anneke Davis, via fax (425) 587-3807. Questions via phone or e-mail will not be accepted. Bidders shall submit questions no later than 7 calendar days before bid opening.

**CONTRACTOR REGISTRATION:**

Pursuant to RCW 39.06, the bidder shall be registered and licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27.

In order to perform public work, the successful bidder and subcontractors, prior to Contract award, shall hold or obtain such licenses and registrations as required by State Statutes and Codes, and Federal and local laws and regulations and a City of Kirkland business license.

**BID SECURITY:**

Certified check, bank cashier’s check or bid bond congruent with the Bid Bond Security Form (Section 00 43 30) as identified in the "Instructions to Bidders" is required to be submitted with each proposal, in the amount equal to five percent (5%) of the total base bid plus additive alternate bids (if applicable). Make bid security payable to the City of Kirkland, furnish bond executed by a licensed bonding agency authorized to do business in the locality of the Project. No bid shall be considered unless accompanied by such bid security.

**RIGHT TO ACCEPT OR REJECT:**

The Contract will be awarded to the responsible bidder submitting the lowest proposal complying with these contract documents provided the bid is reasonable and in the best interest of the City of Kirkland.

The Owner (City of Kirkland) shall reserve the right to reject any or all bid proposals and the right to waive any irregularities or informalities in any proposal, subject to the Laws of the State of Washington as pertinent to Public Works and congruent with requirements and policies of City of Kirkland, and as may be deemed in the best interest of the Owner. In particular, the Owner reserves the right to reject a bid which is not accompanied by the documents specified in the Instructions to Bidders and incomplete or irregular bids which may exclude any item(s) as may be required by the Project Manual.
The City of Kirkland in accordance with Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 USC 2000d to 2000d-4 and Title 49, Code of Federal Regulations, Department of Transportation, Subtitle A, Office of the Secretary, Part 21 Nondiscrimination in Federally-Assisted Programs of the Department of Transportation issued pursuant to such Act, hereby notifies all bidders that it will affirmatively ensure that in any contract entered into pursuant to this invitation, disadvantaged business enterprises as defined in 49 CFR Part 26 will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, national origin, or sex in consideration for an award.

City of Kirkland is an Equal Opportunity and Affirmative Action Employer.

Small, Minority and Women-Owned firms are encouraged to submit bids.

**WITHDRAWAL OF BID:**

No bid proposal may be withdrawn after the time set for the opening thereof, unless the Award of the Contract is delayed for a period of forty-five (45) calendar days.

**NOTICE GIVEN BY ORDER OF THE CITY OF KIRKLAND**

Published in the Daily Journal of Commerce: October 17, 2019

END OF SECTION
SECTION 00 10 10
BIDDER’S CHECKLIST

The omission or deletion of any bid item may be considered non-responsive and may be cause for the rejection of the bid.

1. ☐ Has a bid bond or certified check been enclosed with your bid? Is the amount of the bid guaranty at least 5 percent of the total amount of the bid?

2. ☐ Has the proposal been properly completed and signed? Do written amounts on the proposal agree with the amounts shown in the figures?

3. ☐ Have you bid on all items including, if applicable, all alternates?

4. ☐ Have you acknowledged all addenda, if any, in the Bid Form (Section 00 41 00)

5. ☐ Do not submit any of the forms still attached to the Project Manual. Remove or copy the forms and submit in the sealed envelope as directed.

6. ☐ Are you and all your subcontractors familiar with the schedule of value requirements including but not limited to the required placement of 5% of the bid for work between substantial completion and final completion?

7. ☐ Have you reviewed the Bidder’s Qualifications and Bidder Responsibility Criteria forms and understand these obligations if you are selected as the apparent low bidder?

8. The following items must be completed and included with the Bid Form within the sealed envelope:
   A. ☐ Bid Form (00 41 00) The bid price must be shown in the space provided. Show price in both words and figures. The bid form must be completed in full, signed, and dated.
   B. ☐ Bidder’s Qualifications Form (00 10 20): This form must be filled in and signed. The owner reserves the right to check all statements and to judge the adequacy of the bidder’s qualifications.
   C. ☐ Bid Bond Security Form (00 43 30): A surety issued bid bond must be executed by the bidder and its surety company. The amount of the bid bond shall be not less than five (5%) of the total bid and may be shown in dollars or on a percentage basis. A cashier’s check payable to the City of Kirkland and issued for an amount not less than 5% of the total bid may be submitted in lieu of a bid bond.
   D. ☐ Non-Collusion, Bidder Responsibility, and Minimum Wage Certification Form (00 15 40): This form must be filled in, signed, and notarized.
   E. ☐ Subcontractor Listing (00 44 00): This form must be filled in and signed if the estimated bid amount exceeds $1,000,000 as required by RCW 39.30.060.

9. The following forms are to be executed after the contract is awarded:
   A. ☐ AGREEMENT FORM (00 52 20): This agreement to be executed by the successful bidder.
   B. ☐ PERFORMANCE BOND (00 61 40): One hundred percent of the Contract Price
to be executed by the successful bidder and his surety company. The surety on such bonds shall be a duly authorized surety company satisfactory of the Owner.

C. ☐ LABOR MATERIALS AND TAXES BOND (PAYMENT BOND) (00 61 41): One hundred percent of the Contract Price to be executed by the successful bidder and his surety company. The surety on such bonds shall be a duly authorized surety company satisfactory of the Owner.

D. ☐ RETAINAGE INVESTMENT OPTION (00 45 70): This agreement to be executed by the successful bidder.

J. ☐ CERTIFICATES OF INSURANCE (00 60 00): To be executed by the successful bidder and by an acceptable insurance company. The City of Kirkland must be named as an additional insured.

K. ☐ CONTRACTOR’S CERTIFICATION (00 83 00): Concerning Labor Standards and Prevailing Wage Requirements. Submit Statement of Intent to Pay Prevailing Wages. (Form F 700-029-000, available at Offices of Washington State Department of Labor and Industries).

10. ☐ Special Note: Prior to commencing work, the Contractor and all subcontractors must have applied and paid for a City of Kirkland Business License.

END OF SECTION
SECTION 00 10 20
BIDDER’S QUALIFICATIONS

Each bidder submitting a proposal for this Project shall submit, as part of its bid, the following information:

1. Name of Bidder: __________________________________________________________

2. Business Address: ________________________________________________________
   ______________________________________________________

3. Telephone Number and Area Code: _________________________________________

4. IRS Federal Employer’s Identification Number: _____________________________

5. Current State Unified Business Identification Number_______________________

6. Number of years engaged in the contraction business under the present firm
   Name: ________

7. Total value of contracts in force: _________________________________________

8. To qualify for bidding for this project the General Contractor as the legal entity bidding the
   project shall have constructed within the past (8) eight years the following:
   
   A. A demonstrated body of work of similar complexity and construction cost. AND
   B. Minimum (1) One Municipal project with a total combined value of $2 million dollars
      or greater.

9. **List below project(s) which meet Items A and B or A and C as outlined above.**
   *(Attach additional project pages if required)*

   Project Name: ____________________________________________________________
   Project Value: ____________________________________________________________
   Reference Name, phone number and email: __________________________________

   Project Name: ____________________________________________________________
   Project Value: ____________________________________________________________
   Reference Name, phone number and email: __________________________________

   Project Name: ____________________________________________________________
   Project Value: ____________________________________________________________
   Reference Name, phone number and email: __________________________________

   Project Name: ____________________________________________________________
   Project Value: ____________________________________________________________
   Reference Name, phone number and email: __________________________________
10. Recent significant projects completed by Bidder including owner’s name, Approximate cost, and completion date:

1. 

2. 

3. 

4. 

11. Washington State Contractor Registration Number: ________________________


13. Bonding Capacity: _________________________________________________

Bidder:

By: _______________________  Title: _________________  Date: _______________

This Form Must Be Submitted with the Bid.

END OF SECTION
SECTION 00 15 30
BIDDER’S RESPONSIBILITY CRITERIA

Low Responsible Bidder

It is the intent of the Owner to award a contract to the low responsible bidder. The Bidder must meet the minimum project bidding requirements outlined in Section 00 10 20 Bidder’s Qualifications Section, Item 8.

In addition, the Owner shall consider an overall accounting of the items listed below which the bidder must meet. The bidder must submit the Non-Collusion, Bidder Responsibility, and Minimum Wage Certification Form (00 15 40) demonstrating that they meet the following criteria:

Bid Procedures and Conditions

Qualifications of Bidder

A. Bidders must meet the minimum qualifications of RCW 39.04.350, as amended:

“Before award of a public works contract, a bidder must meet the following responsibility criteria to be considered a responsible bidder and qualified to be awarded a public works project. The bidder must:

(a) At the time of bid submittal, have a certificate of registration in compliance with chapter 18.27 RCW;
(b) Have a current State unified business identifier number;
(c) If applicable, have industrial insurance coverage for the bidder’s employees working in Washington as required in Title 51 RCW; an employment security department number as required in Title 50 RCW; and a State excise tax registration number as required in Title 82 RCW; and
(d) Not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3).
(e) If bidding on a public works project subject to the apprenticeship utilization requirements in RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the date of the bid solicitation; and
(f) Have received training on the requirements related to public works and prevailing wage under this chapter and chapter 39.12 RCW. The bidder must designate a person or persons to be trained on these requirements. The training must be provided by the department of labor and industries or by a training provider whose curriculum is approved by the department. The department, in consultation with the prevailing wage advisory committee, must determine the length of the training. Bidders that have completed three or more public works projects and have had a valid business license in Washington for three or more years are exempt from this subsection. The department of labor and industries must keep records of entities that have satisfied the training requirement or are exempt and make the records available on its web site. Responsible parties may rely on the records made
available by the department regarding satisfaction of the training requirement or exemption; and

(f) Until December 31, 2013, not have violated RCW 39.04.370 more than one time as determined by the Department Of Labor And Industries.

B. In addition to the bidder responsibility criteria above, the bidder must also meet the following relevant supplemental bidder responsibility criteria applicable to the project:

a. The Bidder shall not currently be debarred or suspended by the Federal government. The Bidder shall not be listed as a current debarred or suspended bidder on the U.S. General Services Administration’s “Excluded Parties List System” website. Bidder debarment or suspension status may be verified through this website: http://www.sam.gov/. The Owner may also use other sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

b. The Bidder shall not owe delinquent taxes to the Washington State Department of Revenue, without a payment plan approved by the Washington State Department of Revenue. The Bidder shall not be listed on the Washington State Department of Revenue’s “Delinquent Taxpayer List”, which may be verified at the following website: http://dor.wa.gov/content/fileandpataxes/latefiling/dtlwest.aspx. The Owner may also use other sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

c. The Bidder shall not have been convicted of a crime involving bidding on a public works contract within five (5) years prior to the bid submittal deadline. The Bidder shall provide a duly executed sworn statement (on the included form, or on a form otherwise determined to be acceptable by the Owner), that the Bidder has not been convicted of a crime involving bidding on a public works contract. The Owner may also use independent sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental.

d. The Bidder’s standard subcontract form shall include the subcontractor responsibility language required by RCW 39.06.020, and the Bidder shall have an established written procedure which the Bidder uses to validate the responsibility of each of its subcontractors. The Bidder’s subcontract form shall also include a requirement that each of its subcontractors shall have and document a similar procedure to determine whether the sub-tier subcontractors with whom it contracts are also “responsible” contractors as defined per RCW 39.06.020. The Owner may also use independent sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

e. The Bidder shall not have a record of prevailing wage complaints filed against the Bidder within five (5) years prior to the bid submittal date that demonstrates a
pattern of failing to pay workers prevailing wages, unless there are extenuating circumstances that are acceptable to the Owner. The Owner may also use independent sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

f. The Bidder shall not have had any public works contract terminated for cause by a government agency during the five (5) year period immediately preceding the bid submittal deadline for the project, unless there are extenuating circumstances acceptable to the Owner. The Bidder shall provide a duly executed sworn statement (on the included form, or in a form otherwise determined to be acceptable by the Owner), that the Bidder has not had any public works contract terminated for cause by a government agency during the five (5) year period immediately preceding the bid submittal deadline for the project. The Owner may also use independent sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

g. The Bidder shall not have a record of excessive claims filed against the retainage or payment bonds for public works projects within three (3) years of the bid submittal date, that demonstrate a lack of effective management by the Bidder of making timely and appropriate payments to its subcontractors, suppliers, and workers, unless there are extenuating circumstances which are acceptable to the Owner. The Owner may also use independent sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

h. Within two (2) years prior to the bid submittal date the Bidder shall not have had a project construction site shut down due to a safety violation (i.e., WISHA / OSHA written citations) from the Washington State Department Labor & Industries or analogous agency with jurisdiction in the location the work was performed, regardless of whether such willful and/or serious safety violations have been abated or not. The Bidder shall maintain compliance with all safety and health requirements (i.e., WISHA / OSHA) from the Washington State Department Labor & Industries (or analogous agency with jurisdiction in the location the work is performed). The Owner may verify such information provided with the Washington State Department Labor & Industries or analogous agency with jurisdiction in the location the work was performed. The Owner may also use other sources of information that may be available to otherwise determine whether the Bidder is in compliance with these supplemental criteria.

C. If a Bidder fails to supply the required bidder responsibility documentation, information, or materials, then Bidder may be determined by the Owner to be non-responsive, and the bid may be rejected on this basis. If the Owner determines the apparent successful bidder does not meet the bidder responsibility criteria above and is therefore not a responsible bidder, the Owner shall notify the bidder in writing with the reasons for its determination. If the bidder disagrees with this determination, it may appeal the determination within twenty-four (24) hours of receipt of the Owner’s determination by presenting additional written information to the Owner. The Owner will consider the additional information before issuing its final determination. If the Owner’s final determination affirms that the bidder is not responsible, the Owner will not execute a
contract with any other bidder until two (2) business days after the bidder determined to be not responsible has received the final determination. Please note that the above-described information, materials, and documentation requested by the Owner for purposes of determining Bidder responsibility is not necessarily exclusive, and the Owner expressly reserves the right to request additional information, materials, and documentation as may be determined to be necessary or desirable by the Owner in order to evaluate and determine Bidder’s compliance with the above-described bidder responsibility criteria. At all times, the Owner may also use other sources of information that may be available to otherwise determine whether the Bidder is in compliance with the forgoing bidder responsibility criteria.

END OF SECTION
In accordance with the Contract Documents and Instructions to Bidder, the Bidder must provide the following sworn statement and certification:

Name of Bidder: _____________________________________________
Address: ________________________________________________________
Telephone No.:_______________________________________________
E-Mail:________________________________________________________

I, _________________________ , the undersigned declarant, as the duly authorized representative on behalf of _________________________ (herein the “Bidder”) hereby make this declaration on the basis of facts within the scope of my first hand knowledge and authority to which I am competent to testify:

1. I hereby certify, swear and affirm under penalty of perjury, that the Bidder, as of the date of this declaration (below) meets all of the minimum bidder responsibility qualifications of RCW 39.04.250, as amended.

2. I hereby certify, swear and affirm under penalty of perjury, that the Bidder, as of the date of this declaration (below) meets all of the minimum project bidding requirements outlined in the Bidder’s Qualifications Form (Section 00 10 20) Item 8, if any.

3. I hereby certify, swear and affirm under penalty of perjury, that the Bidder, as of the date of this declaration (below) meets all of the supplemental bidder responsibility criteria as set forth in the Bidder’s Responsibility Criteria (Section 00 15 30), Section B.

4. I hereby certify, swear and affirm under penalty of perjury, that the undersigned is the person that submitted the bid herewith, that such bid is genuine and not a sham or collusive, or made in the interest of any person not therein named; and he/she further says that said Bidder has not directly or indirectly induced or solicited any Bidder on the above work or supplies to put in a sham bid, or any other person or corporation to refrain from bidding; and that said Bidder has not in any manner sought by collusion to secure to himself or to any other person an advantage over any other Bidder or Bidders.

5. I hereby certify, swear and affirm under penalty of perjury, that in connection with the performance of the work of this Project, if awarded, I will pay each classification of laborer, workman, or mechanic employed in the performance of such work; not less than the prevailing rate of wage or not less than the minimum rate of wages as specified in the Contract Documents.
Signed under penalty of perjury under the laws of the State of Washington this _____ day of _______________ 20__, at ____________________________, Washington.

Name of Bidder/Contractor:____________________________
Signature:  ______________________________
Print Name:________________________
Title:  _____________________________

STATE OF WASHINGTON
COUNTY OF ____________

I certify that I know or have satisfactory evidence that ___________________ is the person who appeared before me, and said person acknowledged that he/she signed this instrument, on oath stated that he/she was duly authorized execute the instrument and acknowledged it as the ___________________ of _________________________. to be the free and voluntary act of such party for the uses and purposes herein mentioned.

DATED this _____ day of _______________, 20__.

(SEAL) Notary Public
Print name:________________________
Residing at _______________________
My commission expires _______________

NOTICE TO ALL BIDDERS
To report bid rigging activities call:  1-800-424-9071

The U.S. Department of Transportation (USDOT) operates the above toll-free "hotline" Monday through Friday, 8:00 a.m. to 5:00 p.m., ET. Anyone with knowledge of possible bid rigging, bidder collusion, or other fraudulent activities should use the "hotline" to report such activities.

The "hotline" is part of USDOT's continuing effort to identify and investigate highway construction contract fraud and abuse and is operated under the direction of the USDOT Inspector General. All information will be treated confidentially and caller anonymity will be respected.

END OF SECTION
SECTION 00 20 00
INSTRUCTION TO BIDDERS

A. EXAMINATION OF SITE AND CONSTRUCTION DOCUMENTS

1. Before submitting a proposal, the bidder shall:
   a. Carefully examine the drawings and specifications,
   b. Visit the site of the work, (Bidders are highly encouraged to attend the non-mandatory pre bid walk through meeting)
   c. Fully inform itself of existing conditions and limitation, relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of its obligation to furnish all material and labor necessary to carry out the provisions of this contract.
   d. Rely entirely upon its own judgment in making its proposal,
   e. Include in its bid a sum sufficient to cover all items required by the contract including all labor, materials, services, and incidentals necessary to complete this project.

B. ADDENDA AND INTERPRETATIONS

Bidders shall promptly notify the City of Kirkland of any ambiguity, inconsistency or error which they may discover upon examination of the Project Manual, Drawings, and any Addenda or of the site and local conditions.

Bidders requiring clarification or interpretation of the Project Manual, Drawings, and/or any Addenda shall provide a written request to the City of Kirkland at least seven (7) days prior to the date for receipt of Bids.

Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Project Manual and Drawings. Any interpretation, correction or change of the Project Manual, Drawings, and any Addenda made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

Failure of any bidder to receive Addenda shall not relieve any such bidder from any obligation under its bid as submitted. All Addenda so issued shall become part of the Contract Documents. Bidders shall acknowledge receipt of all Addenda, if any, on the Bid Form. Failure to do so may result in the bid being declared non-responsive.

No oral statements by Owner, Engineer, Architect, or other representative of the Owner shall, in any way, modify the Project Manual, Drawings, and any Addenda whether made before or after letting the Contract.

Questions regarding this project shall be submitted in writing to Project Manager, via fax (425) 587-3807. Questions via phone or e-mail will not be accepted. Bidders shall submit questions no later than seven (7) calendar days before bid opening.
C. PRODUCT SUBSTITUTIONS:

1. Substitutions: Bids must be based upon the specific articles and materials named in the Project Manual, Drawings, and any Addenda. Substitution may be made only under the following conditions:
   a. Prior to Bid Opening: Not less than seven (7) calendar days prior to bid opening, prime bidders may submit to the City of Kirkland written requests for approval of articles or materials, accompanied by complete descriptions, technical data and samples. Approval or rejection of the proposed substitutions will be made by addenda issued to all bidders. Submit material/product requests as specified in Section 01 61 00 to Anneke Davis via fax (425) 587-380.
   b. After Award of Contract: Approval of substitution will be made only in exceptional cases where the Contractor submits satisfactory evidence to the City of Kirkland that through no fault of its own, specified or otherwise approved items cannot be obtained in time to avoid delay to the work. Approval in such cases shall conform to the other requirements above.

D. BID FORM (Section 00 41 00)

Bids must be submitted on and according to the Bid Form. Fill in all spaces. Bids shall not contain any recapitulation of work done. State numbers in writing and in figures. Completed form must be without interlineation, alteration or erasure. Signatures shall be in longhand. The bid price (s) for the work as specified in the Project Manual, Drawings, any Addenda and any Alternates must be the total price to cover all items required by the contract including all labor, materials, services, taxes, permits, and incidentals necessary to complete this project.

E. POWER OF ATTORNEY

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of the power of attorney.

F. ORAL AND TELEGRAPHIC BIDS

Oral and telephonic modifications of bids cannot be considered.

G. SUBMISSION OF BID

Enclose bid and bid bond in opaque sealed envelope, as indicated in the Invitation to Bid; Deliver in person or by post. Bidder is responsible for delivery of bid at or before the time set for bid opening. The Owner may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. 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 obligation of the contract and to complete the work contemplated therein. Conditional bids will not be accepted. No proposal or bid may be changed after the time set for receiving bids.
H. BID BOND

Each bidder agrees to furnish a certified check, bank cashier’s check, or bid bond in the amount equal to five percent (5%) of the total base bid plus addictive alternative bids (if applicable) within its bid proposal. Failure to provide this bid security when required shall render the bid non-responsive. The right is reserved to hold the bid security of the three lowest bidders until the award of the contract or for a period of (60) sixty days, whichever is the shorter time. Bids of all unsuccessful bidders will be returned as soon as feasible after the bid opening.

WITHDRAWAL OF BIDS

Any bidder may withdraw its bid either personally or by written request at any time prior to the hour set for the bid opening. No bid may be withdrawn or modified after the time set for opening unless and until the award of the contract is delayed for period exceeding (45) forty-five days.

J. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work within 10 days of the signing and execution of the contract by the Owner and the Contractor and receipt of the Notice to Proceed; and Substantially Complete the Work within 195 consecutive calendar days of the date of the Notice to Proceed, and to Finally Complete the Work within (30) thirty consecutive calendar days thereafter. Bidder must agree to pay as liquidated damages the sum of $1000 for each consecutive calendar day that Substantial Completion is delayed and the sum of $500 thereafter for each consecutive calendar day that Final Completion is delayed. Liquidated damages have been established based on the estimated cost that will be incurred by City of Kirkland in the event the Contractor fails to complete the Work in the time stipulated.

K. SECURITY FOR FAITHFUL PERFORMANCE

Simultaneously with its delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of the Contract and for payment of all persons performing labor under the Contract and furnishing material or services in connection with the Contract as described in the Contract Documents. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the Owner, registered in the State of Washington, Insurance Commissioner’s Office. List Bonding Agent and address of same.

L. INSURANCE

The Contractor shall obtain such construction insurance as is set forth in Section 00 60 00 “Bonds and Certificates.”

M. QUALIFICATIONS OF BIDDERS

Bidder must meet all criteria set forth in the Bidder’s Qualifications (Section 00 10 20), Item 8 and the Bidder’s responsibility Criteria in Section 00 15 30). The Owner may make such investigations as necessary to determine the ability of a Bidder to perform the work, and the Bidder shall furnish all such information and data as may be requested prior to bidding. The Owner reserves the right to reject any bid if the evidence submitted by, or if investigation of,
such Bidder fails to satisfy the Owner that such Bidder is properly qualified to perform the obligations of the Contract and to complete the work contemplated therein. Conditional Bids will not be accepted.

N. LAWS AND REGULATIONS

The bidder’s attention is directed to the fact that all applicable State laws, municipal ordinances, and rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the Contract throughout, and they shall be deemed to be included in the Contract the same as though written out in full therein. Bidders are advised that if successful, they will be required to meet all applicable federal, state, and local laws pertaining to permits, licenses, fees and taxes, as well as laws pertaining to employment and wages. Bidders are responsible for determining the extent and applicability of such laws.

O. AWARD OF THE CONTRACT/REJECTION OF BIDS

1. The Contract will be awarded to the responsible bidder submitting the lowest proposal complying with the condition of the Invitation for Bid and these contract documents provided the bid is reasonable and in the best interest of The Owner. Items in this bid, approved for contract by City of Kirkland, shall be awarded by the City of Kirkland.

2. City of Kirkland reserves the right to reject any and all bids and to waive any informality in bids received whenever such rejection or waiver is in the interest of the Owner. City of Kirkland reserves the right to select all or individual alternate bid items whichever is determined to be in the best interest of the City of Kirkland.

3. The bidder to whom the award is made will be notified at the earliest practicable date.

P. DISQUALIFICATION OF BIDDERS

Any one or more of the following causes may be considered sufficient for the disqualification of a Bidder and the rejection of its bid or bids:

   a. Evidence of collusion among Bidders.
   b. Lack of expertise as shown by past work, and judged from the standpoint of workmanship and performance history.
   c. Uncompleted work under other contracts which, in the judgment of the City, might hinder or prevent the prompt completion of additional work if awarded.
   d. Being in arrears on existing contracts, in litigation with an Owner, or having defaulted on a previous contract.
   e. Contractor’s naming oneself as a Subcontractor for which they have no expertise and working knowledge directly within the firm.
   f. Contractor’s inability to meet the Bidder’s Qualifications (Section 00 10 20) outlined in item 8.
   g. Contractor’s inability to meet the Bidder’s Responsibility Criteria outlined in Section 00 15 30.
   h. Failure to comply with any requirements of the Invitation for Bid or Instructions to Bidders.
END OF SECTION
SECTION 00 30 00
INFORMATION AVAILABLE TO BIDDERS

The following Documents are attached for the Contractor's reference.

A. Limited Good Faith Asbestos and Lead Inspection by:
   NVL Labs
   4708 Aurora Ave N
   Seattle, WA 98103

   Report Name: Good Faith Asbestos and Lead Inspection, 25 pages total
   Title/Number: (Restrooms/Bath House)
   Project Number: 2015-351
   9703 NE Juanita Dr.
   Kirkland, WA 98034

1. Results of investigations made upon the site and other studies of the site are contained in reports by NVL Labs. The investigation results and recommendations are part of the Contract Documents and are made available to the Contractor for information only. All recommendations shall be implemented where applicable.

END OF SECTION
Good Faith Asbestos And Lead Inspection

(Restrooms / Bath House)
9703 NE Juanita Dr.
Kirkland, WA 98034

Prepared For
Mr. Michael Cogle
City of Kirkland - Parks Deputy Director
123 5th Avenue
Kirkland, WA 09033

Project Number 2015-351
Inspection Date May 1, 2015
Report Date May 6, 2015
Inspected By David Fiala
AHERA Certification # 150602
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APPENDICIES

A  Sample Locations (Floor Plan)

B  Laboratory Analysis Results

C  AHERA Certification & Laboratory Qualifications
1.0 SCOPE OF WORK

A Good Faith Asbestos and Lead Inspection was conducted on the structure located at 9703 NE Juanita Dr. Kirkland, WA 98034 on May 1, 2015.

David Fiala, an AHERA Certified Building Inspector, conducted this survey at the request of Mr. Michael Cogle of the City of Kirkland.

The purpose of this inspection was to identify asbestos containing materials and lead containing paint coatings which would be impacted by the planned demolition of the restrooms/rental shop. Destructive sampling methods were utilized to collect samples of suspect building materials. No soft/limited demolition was performed during this inspection. Please note that hidden materials may exist within the structure, and all suspect materials must be treated as asbestos containing until testing proves otherwise.

This survey constitutes a survey of accessible suspect ACM in the project area and was conducted in accordance with:


This asbestos survey also satisfies the requirements for “Good Faith” inspection outlined in Washington Administrative Code (WAC) 296-62-07221(2), Identification, which requires the owner of a structure to provide contractors with a written report identifying the asbestos-containing materials expected to be disturbed during renovation or demolition.

The asbestos survey section is written to comply with the AHERA asbestos sampling procedure as stated in 40 CFR 763.86. This protocol is required under the Puget Sound Clean Air Agency (PSCAA Regulation III, Article IV, rev. July 13, 2000) for all asbestos surveys prior to a building demolition.

Recommendations have been included for compliance with WAC 296-155-176 “Lead in Construction”. The Lead in Construction regulations are designed to protect workers from lead hazards during construction and demolition activities.

A floor plan indicating locations of samples collected by NVL personnel has been included in Appendix A.
2.0 SURVEY METHOD

Asbestos Survey Method

The NVL Labs field inspector is an Asbestos Building Inspector, certified under the requirements of the United States Environmental Protection Agency (EPA) Asbestos Hazard Emergency Response Act (AHERA) regulation 40 CFR 763, Subpart E. A copy of his certificate is provided in Appendix C.

The AHERA Guidelines dictate the following:

The inspector must determine homogenous areas, which are defined as an area of Thermal System Insulation, Surfacing Material, or Miscellaneous Material that is uniform in texture and color.

Once homogenous areas have been determined, the inspector must determine whether or not material is friable or non-friable. Friable is defined as a material, that when dry, can be crushed, pulverized, or reduced to dust using hand pressure, and non-friable material is defined as a material, that when dry, cannot be crushed pulverized or reduced to dust using hand pressure. Materials normally defined as non-friable can become friable by definition if sufficiently damaged.

Once friability has been determined, the materials suspected of containing asbestos are divided into one of three categories: Thermal System Insulation (TSI), Surfacing Material (SM), or Miscellaneous Material (MM). Generally speaking, TSI and SM are considered to be friable, with the exception of TSI where the structural integrity of the insulation is intact and the protective out wrap is undamaged.

Once materials are divided into one of the categories, samples are collected in the following manner:

Friable Thermal System Insulation:

1. Inspector shall collect three (3) randomly distributed samples;

2. Inspector shall collect a minimum of one sample of each TSI materials that appears to have been used as a patch, as long as the patch is less than six linear feet or six square feet;

3. Inspector shall collect in a manner sufficient, samples from areas of TSI applied to fittings, tees, and joints.

Friable Surfacing Material:

1. Inspector shall collect samples in random manner of surfacing materials as follows:

   a. Collect three bulk samples from an area believed to be homogeneous (defined as a material that appears to be the same or similar and was installed at the same time) that is 1,000 square feet or less in size;

   b. Collect five bulk samples from an area believed to be homogeneous that is greater than 1,000 square feet in size, but less than 5,000 square feet in size;

   c. Collect seven bulk samples from an area believed to be homogeneous that is greater than 5,000 square feet.
Miscellaneous Materials:

1. Inspector shall collect samples in a manner and number sufficient to determine if the material is asbestos-containing or not.

All Materials Determined to Be Non Friable:

1. Inspector shall collect samples in a manner and number sufficient to determine if the material is asbestos containing or not.

In addition to these sampling requirements, the AHERA Building Inspector is required to assess the following of each material that is found to be positive for asbestos:

1. The condition of each material;
2. Accessibility;
3. Possibility for air erosion.

Once the samples have been collected, they must be analyzed by an accredited laboratory, and they must be analyzed using polarized light microscopy methods, commonly referred to as EPA Method 600/R-93/116.

NVL Labs collected samples and obtained analytical data for suspect asbestos-containing materials identified in the building. Once collected, each bulk sample was sealed in an unadulterated plastic bag to eliminate the possibility of cross-contamination. “Chain-of-Custody” tracking was followed to maintain sample integrity during handling and data reporting at NVL Labs.

A walk-through inspection of all accessible areas of this structure was performed to identify potential asbestos-containing materials. The walk-through inspection included a review of the internal and external aspects of this structure. The locations and types of potential asbestos-containing materials were noted.

Homogeneous Materials

Homogeneous materials are defined as an area of asbestos-containing material or presumed asbestos-containing material which appears similar throughout in terms of color, texture, and date of material application. The report listing for homogenous materials will appear as follows:

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Material Description by Layer</th>
<th>Location</th>
<th>Asbestos</th>
<th>Quantity</th>
<th>Friable</th>
</tr>
</thead>
</table>
| #             | Layer 1 is not asbestos-containing  
Layer 2 is asbestos-containing | Location description | 1. %  
2. % | “X” LF/ft² | Yes/No |

Lead Survey Method

NVL Labs collected representative samples of paint from the interior and exterior of the building within the project scope. Once collected, each bulk sample was sealed in an unadulterated plastic bag to eliminate the possibility of cross-contamination. “Chain-of-Custody” tracking was followed to maintain sample integrity during handling and data reporting at NVL Labs. Sampling was representative of all layers of paint. Copies of laboratory reports and field data forms for lead paint are in Appendix B.
3.0 LABORATORY INFORMATION

Laboratory Analysis: Asbestos

In accordance with 40 CFR Chapter 1 (1-1-87 edition) Part 763, Subpart F, Appendix A, asbestos samples are analyzed at NVL Labs using polarized light microscopy (PLM) with dispersion staining. If samples are not homogeneous, then sub-samples of the components are analyzed separately. All bulk samples are analyzed using EPA Method 600/R-93/116 with the following measurement uncertainties for reported % asbestos: 1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%. Only materials containing more than 1% total asbestos were classified as “asbestos-containing” based on EPA, state, and local regulations.

Findings for samples containing more than one separable layer of materials are reported for each layer. The asbestos concentration in the sample is determined by visual estimation.

NVL Labs is accredited by the National Institute of Standards and Technology (NIST) under the National Volunteer Laboratory Accreditation Program (NVLAP) program for bulk asbestos fiber analysis; NVLAP Lab Code 102063-0

Laboratory Accreditation

Professional accreditations for NVL Laboratories, Inc. include the following:

NVL Laboratories, Inc. is currently accredited by the National Institute of Standards and Technology (NIST) under the National Volunteer Laboratory Accreditation Program (NVLAP) program for bulk asbestos fiber analysis.

NVLAP Lab Code 102063-0

NVL Laboratories, Inc. is approved by the American Industrial Hygiene Association (AIHA) Asbestos Analysts Registry (AAR) program for airborne asbestos fiber analysis.

AAR Counter ID 7412

NVL Laboratories, Inc. is currently accredited by the American Industrial Hygiene Association (AIHA) under the Industrial Hygiene Laboratory Accreditation Program (IHLAP). The IHLAP program is designed specifically for laboratories involved in analyzing samples to evaluate workplace exposure.

IHLAP Certification Number 563
4.0 BUILDING DESCRIPTION

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Building Type</td>
<td>This is a one story structure of wood framed construction.</td>
</tr>
<tr>
<td>Primary External Components</td>
<td>The exterior of the structure is wood siding and CMU.</td>
</tr>
<tr>
<td>Foundation Type</td>
<td>The building has an on-grade concrete slab foundation.</td>
</tr>
<tr>
<td>Roofing Material(s)</td>
<td>The structure has a white rubber membrane roof.</td>
</tr>
<tr>
<td>Window Type(s)</td>
<td>The windows of the structure are aluminum framed with no associated caulking/glazing.</td>
</tr>
<tr>
<td>Flooring</td>
<td>The flooring of the structure is bare concrete throughout.</td>
</tr>
<tr>
<td>Thermal Systems With Insulation</td>
<td>The building is not heated.</td>
</tr>
<tr>
<td>Finishing</td>
<td>The structure is finished with wood panels, CMU, and some drywall.</td>
</tr>
</tbody>
</table>
### 5.0 FINDINGS

**Inventory of Suspect Asbestos-Containing Materials**

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Material Description by Layer</th>
<th>Location</th>
<th>Asbestos</th>
<th>Quantity **</th>
<th>Friable*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-351-3-1</td>
<td>Drywall with paper</td>
<td>Gator storage room</td>
<td>ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-351-3-2</td>
<td>1: Orange laminate</td>
<td>Restroom supply room</td>
<td>1: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Tan mastic</td>
<td></td>
<td>2: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-351-3-3</td>
<td>1: Green laminate</td>
<td>Life guard room</td>
<td>1: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Tan mastic</td>
<td></td>
<td>2: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-351-3-4</td>
<td>1: White laminate</td>
<td>Life guard room</td>
<td>1: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: White/yellow mastic</td>
<td></td>
<td>2: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-351-3-5</td>
<td>1: CMU</td>
<td>Exterior, walls</td>
<td>1: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Gray mortar</td>
<td></td>
<td>2: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-351-3-6</td>
<td>1: White rubber membrane roof</td>
<td>Exterior, roof, E side</td>
<td>1: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Insulation</td>
<td></td>
<td>2: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-351-3-7</td>
<td>1: White rubber membrane roof</td>
<td>Exterior, roof, W side</td>
<td>1: ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2: Insulation</td>
<td></td>
<td>2: ND</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ND None Detected

Any suspect material(s) not identified above should not be disturbed and should be tested immediately. The suspect material must be treated as asbestos-containing until testing proves otherwise.

**Inventory of Suspect Lead-Containing Paint Coatings**

<table>
<thead>
<tr>
<th>Sample Number</th>
<th>Material Description</th>
<th>Location</th>
<th>Lead in mg/kg</th>
<th>Lead in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-351-Pb-1</td>
<td>White paint on wood</td>
<td>Interior wall/ceiling paneling</td>
<td>420.0</td>
<td>0.0420</td>
</tr>
<tr>
<td>2015-351-Pb-2</td>
<td>White paint on CMU</td>
<td>Interior walls</td>
<td>1400.0</td>
<td>0.1400</td>
</tr>
<tr>
<td>2015-351-Pb-3</td>
<td>Brown paint on metal</td>
<td>Interior support beams</td>
<td>2800.0</td>
<td>0.2800</td>
</tr>
<tr>
<td>2015-351-Pb-4</td>
<td>Gray paint on concrete</td>
<td>Interior restroom floors</td>
<td>&lt; 48.0</td>
<td>&lt; 0.0048</td>
</tr>
<tr>
<td>2015-351-Pb-5</td>
<td>Brown paint on wood</td>
<td>Exterior doors/frames</td>
<td>2100.0</td>
<td>0.2100</td>
</tr>
<tr>
<td>2015-351-Pb-6</td>
<td>Brown paint on wood</td>
<td>Exterior siding</td>
<td>&lt; 47.0</td>
<td>&lt; 0.0047</td>
</tr>
<tr>
<td>2015-351-Pb-7</td>
<td>Brown paint on CMU</td>
<td>Exterior walls</td>
<td>&lt; 47.0</td>
<td>&lt; 0.0047</td>
</tr>
</tbody>
</table>

< Lead content of material analyzed is below the Lower Detection Limit.
Samples in bold contain lead in excess of detectable levels.

NVL Laboratories, Inc.
4708 Aurora Ave N
Seattle, WA 98103
Phone (206) 547-0100 • Fax (206) 634-1936
6.0 CONCLUSIONS AND RECOMMENDATIONS

Asbestos was not identified in any of the samples taken from the subject structure during the Good Faith Asbestos Inspection on May 1, 2015.

Contractors should be aware that concealed suspect asbestos-containing building materials may be uncovered during the course of demolition or renovation work. Contractors should have contingency plans that include stopping work, evacuation of the immediate area and sampling by a certified AHERA Building Inspector whenever these materials are found. Concealed suspect materials may include, but are not limited to: non-fiberglass pipe or roof drain insulation; spray-applied coatings; cement board; asphalt or paper vapor barriers; floorings and adhesives.

If discovered, all asbestos-containing materials that will be disturbed as a natural part of renovation and/or demolition are required to be removed and disposed of in accordance with Washington State regulations. Washington State Department of Labor and Industries and PSCAA requires that the abatement be performed using Certified Asbestos Workers under the direct on site supervision by a Certified Asbestos Supervisor. Further, NVL suggests that an AHERA inspector review this property after abatement to ensure all asbestos-containing materials have been removed by the contractor.

NVL Labs, Inc. is making the following recommendations regarding asbestos:

1. A copy of this inspection report should be maintained at the project site during the duration of any renovations.

2. A copy of this inspection report should be provided to the General Contractor and any Sub Contractors working on the renovation project.

3. A licensed asbestos abatement contractor must be utilized to remove any asbestos-containing materials that will be impacted by the renovations.

Lead

Lead-containing paint was identified in the following paint chip samples collected from the subject residence, worker protection protocols apply:

- White paint on interior wood walls/ceilings.
- White paint on interior CMU walls.
- Brown paint on interior metal support beams.
- Brown paint on exterior wood doors/frames.

The Federal Occupational Safety & Health Administration’s (OSHA) interim lead safety standard (29 CFR 1926.59) for the construction industry became effective on June 3, 1993. Lead exposure in construction is regulated in Washington State by WAC 296-155-176. These regulations protect workers disturbing building surfaces with lead-containing paints. Paint with “any detectable level” of lead is classified as a lead-containing paint by federal and state regulations and the applicable worker safety provisions must be implemented.
WORKER EXPOSURE

WAC 296-155-176, Lead (Pb), applies to all construction work where an employee may be occupationally exposed to Lead (Pb). Construction work includes activities such as demolition or salvage, removal or encapsulation, and renovation of materials that contain Lead (Pb). When an employee may be occupational exposed to Lead (Pb), the employer must perform an exposure assessment according to WAC 296-155-176.

The exposure assessment consists of personal air monitoring to determine representative Lead (Pb) exposure levels for the work being performed. During the exposure assessment, the employer must provide the following:

- As a minimum, a half mask air purifying respirators equipped with high efficiency particulate air (HEPA) filters in accordance with WAC 296-155-17613.

- Appropriate personal protective clothing and equipment in accordance with WAC 296-155-17615.

- A designated change area which allows for separate storage areas for work and street clothing to prevent cross contamination in accordance with WAC 296-155-17619(2).

- Hand washing facilities to allow employees to wash their hands and faces WAC 296-155-17619(5).

- Biological monitoring in the form of blood survey and analysis for Lead (Pb) and zinc protoporphyrin levels in accordance with WAC 296-155-17621 (1) (a).

- Training to include hazard communication, safety, and the limitations, proper use, and maintenance of respirators in accordance with WAC 296-155-100.

In addition to the protective equipment and hygiene requirements, the employer must attempt to reduce the levels of airborne Lead (Pb) through the use of engineering controls such as ventilation and wet methods.
7.0 LIMITATIONS OF SURVEY

The purpose of this Good Faith Asbestos and Lead Survey report is to document asbestos-containing materials and lead-containing paint coatings discovered at 9703 NE Juanita Dr. Kirkland, WA 98034 on May 1, 2015.

The purpose of this inspection was to identify asbestos containing materials and lead containing paint coatings which would be impacted by the planned demolition of the restrooms/rental shop. Destructive sampling methods were utilized to collect samples of suspect building materials. No soft/limited demolition was performed during this inspection. Please note that hidden materials may exist within the structure, and all suspect materials must be treated as asbestos containing until testing proves otherwise.

This site visit consisted of a thorough visual walk-through of the building for the purpose of viewing and sampling potential asbestos-containing material. As hazardous material surveys are non-comprehensive by nature, NVL Laboratories, Inc. cannot be held liable for materials which require destructive means to access, materials which are hidden from sight (e.g. materials hidden behind walls), materials which cannot be found due to their obscure nature, or which otherwise cannot be discovered with reasonable diligence.

This document is the sole property of NVL Laboratories and the property owner, or his agent, authorizing this survey.

Inspected By

David Fiala
AHERA Building Inspector
Certification # 150602
Expiration Date: March 31, 2016

Reviewed By

Syed Hasan
Manager Field Services
AHERA Certification # 147944
Expiration Date: August 13, 2015

NVL Laboratories, Inc.
4708 Aurora Ave N
Seattle, WA 98103
Phone (206) 547-0100 • Fax (206) 634-1936
Appendix A

Sample Locations (Floor Plan)
Appendix B

Laboratory Analysis Report
**Bulk Asbestos Fibers Analysis**

By Polarized Light Microscopy

**Batch #: 1507930.00**

Client Project #: 2015-351

Date Received: 5/1/2015

Samples Received: 7

Samples Analyzed: 7

Method: EPA/600/R-93/116 & EPA/600/M4-82-020

---

**Lab ID: 15043757**  
**Client Sample #: 2015-351-3-1**

Location: 9703 NE Juanita Dr. Kirkland, WA 98034

Layer 1 of 1  
**Description:** White chalky material with paper  
**Non-Fibrous Materials:**  
- Fine particles, Gypsum/Binder  
**Other Fibrous Materials:**  
- Cellulose 20%  
- Glass fibers 5%  
**Asbestos Type:** %  
None Detected ND

---

**Lab ID: 15043758**  
**Client Sample #: 2015-351-3-2**

Location: 9703 NE Juanita Dr. Kirkland, WA 98034

Layer 1 of 2  
**Description:** Brown flat hard compressed fibrous material with orange surface  
**Non-Fibrous Materials:**  
- Fine particles, Binder/Filler  
**Other Fibrous Materials:**  
- Cellulose 60%  
**Asbestos Type:** %  
None Detected ND

Layer 2 of 2  
**Description:** Tan soft mastic  
**Non-Fibrous Materials:**  
- Mastic/Binder  
**Other Fibrous Materials:**  
None Detected ND

---

**Lab ID: 15043759**  
**Client Sample #: 2015-351-3-3**

Location: 9703 NE Juanita Dr. Kirkland, WA 98034

Layer 1 of 2  
**Description:** Brown flat hard compressed fibrous material with green/black surface  
**Non-Fibrous Materials:**  
- Fine particles, Binder/Filler  
**Other Fibrous Materials:**  
- Cellulose 55%  
**Asbestos Type:** %  
None Detected ND

Layer 2 of 2  
**Description:** Tan soft mastic with paint  
**Non-Fibrous Materials:**  
- Mastic/Binder, Paint  
**Other Fibrous Materials:**  
None Detected ND

---

**Lab ID: 15043760**  
**Client Sample #: 2015-351-3-4**

Location: 9703 NE Juanita Dr. Kirkland, WA 98034

---

Sampled by: Client  
Analyzed by: Nadezhda Prsyazhnyuk  
Reviewed by: Nick Ly  
Date: 05/04/2015

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=5-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government.
# Bulk Asbestos Fibers Analysis

**By Polarized Light Microscopy**

**Client:** NVL Field Services Division  
**Address:** 4708 Aurora Ave. N.  
Seattle, WA 98103  

**Attention:** Mr. David Fiala  
**Project Location:** 9703 NE Juanita Dr. Kirkland, WA 98034

**Batch #: 1507930.00**  
**Client Project #: 2015-351**  
**Date Received:** 5/1/2015  
**Samples Received:** 7  
**Samples Analyzed:** 7  
**Method:** EPA/600/R-93/116 & EPA/600/M4-82-020

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Non-Fibrous Materials</th>
<th>Other Fibrous Materials</th>
<th>Asbestos Type</th>
<th>Sample Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 2</td>
<td>Brown flat hard compressed fibrous material with white surface</td>
<td>Fine particles, Binder/Filler</td>
<td>Other Fibrous Materials:</td>
<td>Asbestos Type:</td>
<td>% None Detected ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cellulose 65%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 of 2</td>
<td>White and yellow soft mastic</td>
<td>Non-Fibrous Materials:</td>
<td>Other Fibrous Materials:</td>
<td>Asbestos Type:</td>
<td>% None Detected ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mastic/Binder</td>
<td>Cellulose 4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lab ID: 15043761**  
**Client Sample #: 2015-351-3-5**  
**Location:** 9703 NE Juanita Dr. Kirkland, WA 98034

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Non-Fibrous Materials</th>
<th>Other Fibrous Materials</th>
<th>Asbestos Type</th>
<th>Sample Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 2</td>
<td>White brittle material with paint</td>
<td>Binder/Filler, Mineral grains, Paint</td>
<td>Other Fibrous Materials:</td>
<td>Asbestos Type:</td>
<td>% None Detected ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>None Detected ND</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 of 2</td>
<td>Light gray brittle material with paint</td>
<td>Non-Fibrous Materials:</td>
<td>Other Fibrous Materials:</td>
<td>Asbestos Type:</td>
<td>% None Detected ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fine particles, Binder/Filler, Paint</td>
<td>Cellulose 97%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lab ID: 15043762**  
**Client Sample #: 2015-351-3-6**  
**Location:** 9703 NE Juanita Dr. Kirkland, WA 98034

<table>
<thead>
<tr>
<th>Layer</th>
<th>Description</th>
<th>Non-Fibrous Materials</th>
<th>Other Fibrous Materials</th>
<th>Asbestos Type</th>
<th>Sample Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 2</td>
<td>Light gray soft material with white fibrous mesh</td>
<td>Binder/Filler</td>
<td>Other Fibrous Materials:</td>
<td>Asbestos Type:</td>
<td>% None Detected ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Synthetic fibers 30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 of 2</td>
<td>Gray compressed fibrous material with paint</td>
<td>Non-Fibrous Materials:</td>
<td>Other Fibrous Materials:</td>
<td>Asbestos Type:</td>
<td>% None Detected ND</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fine particles, Adhesive/Binder, Paint</td>
<td>Cellulose 97%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Lab ID: 15043763**  
**Client Sample #: 2015-351-3-7**  
**Location:** 9703 NE Juanita Dr. Kirkland, WA 98034

**Sampled by:** Client  
**Analyzed by:** Nadezhda Prisyazhnuyk  
**Reviewed by:** Nick Ly  
**Date:** 05/04/2015  
**Date:** 05/04/2015  

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=±0-3%, 5%=±1-5%, 10%=±5-15%, 20%=±10-30%, 50%=±40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government.
Bulk Asbestos Fibers Analysis
By Polarized Light Microscopy

Client: NVL Field Services Division
Address: 4708 Aurora Ave. N.
Seattle, WA 98103

Attention: Mr. David Fiala
Project Location: 9703 NE Juanita Dr. Kirkland, WA 98034

Batch #: 1507930.00
Client Project #: 2015-351
Date Received: 5/1/2015
Samples Received: 7
Samples Analyzed: 7
Method: EPA/600/R-93/116 & EPA/600/M4-82-020

Layer 1 of 2 Description: Light gray soft material with white fibrous mesh
Non-Fibrous Materials:  Other Fibrous Materials:%
Binder/Filler          Synthetic fibers 35%

Layer 2 of 2 Description: Gray compressed fibrous material with paint
Non-Fibrous Materials:  Other Fibrous Materials:%
Fine particles, Adhesive/Binder, Paint  Cellulose 98%

Asbestos Type: %
None Detected ND

Sampled by: Client
Analyzed by: Nadezhda Pryszynnyuk
Reviewed by: Nick Ly
Date: 05/04/2015

Note: If samples are not homogeneous, then subsamples of the components were analyzed separately. All bulk samples are analyzed using both EPA 600/R-93/116 and 600/M4-82-020 Methods with the following measurement uncertainties for the reported % Asbestos (1%=0-3%, 5%=1-9%, 10%=6-15%, 20%=10-30%, 50%=40-60%). This report relates only to the items tested. If sample was not collected by NVL personnel, then the accuracy of the results is limited by the methodology and acuity of the sample collector. This report shall not be reproduced except in full, without written approval of NVL Laboratories, Inc. It shall not be used to claim product endorsement by NVLAP or any other agency of the US Government.
**NVL Laboratories, Inc.**
4708 Aurora Ave N, Seattle, WA 98103
p 206.547.0300 | f 206.634.3936 | www.nvllabs.com

**CHAIN of CUSTODY SAMPLE LOG**

<table>
<thead>
<tr>
<th>NVL Batch Number</th>
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<th>Total Samples</th>
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<tr>
<td></td>
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<tr>
<td>3 Days</td>
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<tr>
<td>10 Days</td>
<td>☐</td>
</tr>
</tbody>
</table>

| ☐ Please call for TAT less than 24 Hrs |

| Email address | CAnderson@kirklandwa.gov |

---

**Phone:** (425) 587-3349  
**Fax:**

- **Asbestos Air**
- **PCM (NIOSH 7400)**
- **TEM (NIOSH 7402)**
- **TEM (AHRA)**
- **TEM (EPA Level II)**
- **Other**

- **Asbestos Bulk**
- **PLM (EPA/600/R-93/115)**
- **PLM (EPA Point Count)**
- **PLM (EPA Gravimetry)**
- **TEM BULK**

- **Mold/Fungus**
- **Mold Air**
- **Mold Bulk**
- **Rotometer Calibration**

- **Metals**
  - **Total Metals**
  - **TCLP**
  - **Cr 6**

- **Det. Limit**
  - **FAA (ppm)**
  - **ICP (ppm)**
  - **GFAA (ppb)**

- **Matrix**
  - **Air Filter**
  - **Drinking water**
  - **Dust/wipe (Area)**

- **RCRA Metals**
  - **Arsenic (As)**
  - **Berulium (Co)**
  - **Cadmium (Cd)**
  - **Mercury (Hg)**

- **Metal**: All 8

- **Other Metals**: All 13
  - **Copper (Cu)**
  - **Nickel (Ni)**
  - **Zinc (Zn)**

| Condition of Package | ☐ Good | ☐ Damaged (no spillage) | ☐ Severe damage (spillage) |

<table>
<thead>
<tr>
<th>Seq. #</th>
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<th>Client Sample Number</th>
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<th>A/R</th>
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</tbody>
</table>

---

Print Below:  
Sign Below:  
Company:  
Date: 5/15  
Time: 8:03 AM

- **Sampled by**: David F.  
- **Relinquished by**:  
- **Received by**:  
- **Analyzed by**:  
- **Results Called by**:  
- **Results Faxed by**:  

---

**Special Instructions:** Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Results report to:  

David F.
### Analysis Report

**Total Lead (Pb)**

**Client:** NVL Field Services Division  
**Address:** 4708 Aurora Ave. N.  
**Seattle, WA 98103**

**Attention:** Mr. David Fiala  
**Project Location:** 9703 NE Juanita Dr. Kirkland, WA 98034

**Batch #: 1507933.00**  
**Matrix:** Paint  
**Method:** EPA 3051/7000B  
**Client Project #: 2015-351**  
**Date Received:** 5/1/2015  
**Samples Received:** 7  
**Samples Analyzed:** 7

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<th>Lab ID</th>
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<th>Sample Weight (g)</th>
<th>RL in mg/Kg</th>
<th>Results in mg/Kg</th>
<th>Results in percent</th>
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---

**Sampled by:** Client  
**Analyzed by:** Yasuyuki Hida  
**Reviewed by:** Nick Ly  
**Date Analyzed:** 05/04/2015  
**Date Issued:** 05/04/2015

**mg/Kg =** Milligrams per kilogram  
**Percent =** Milligrams per kilogram / 10000  
**RL =** Reporting Limit  
**'<1' = Below the reporting Limit**

**Note:** Method QC results are acceptable unless stated otherwise. Unless otherwise indicated, the condition of all samples was acceptable at time of receipt.

**Bench Run No:** 35-0504-3
Client: NVL Laboratories Inc
Street: 4708 Aurora Ave N
Seattle, WA 98103

Project Manager: Syed Hasan
Project Location: 9703 NE Juanita Dr
Kirkland, WA 98034

Phone: (425) 587-3349
Fax:

- Asbestos Air
- PCM (NIOSH 7400)
- TEM (NIOSH 7402)
- TEM (AHERA)
- TEM (EPA Level II)
- Other
- Asbestos Bulk
- PLM (EPA/600/R-93/116)
- PLM (EPA Point Count)
- PLM (EPA Gravimetry)
- TEM BULK
- Mold/Fungus
- Mold Air
- Mold Bulk
- Rotometer Calibration

**METALS**
- Total Metals
  - TCLP
  - Cr 6
- Copper (Cu)
- Lead (Pb)
- Nickel (Ni)
- Zinc (Zn)

**Condition of Package:**
- Good
- Damaged (no spillage)
- Severe damage (spillage)

<table>
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<tr>
<th>Seq. #</th>
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Print Below
- Sampled by: David F.
- Reclaimed by: David F.
- Received by: J. Shearer
- Analyzed by: Yasuyuki Hida
- Results Called by:
- Results Faxed by:

Special Instructions: Unless requested in writing, all samples will be disposed of two (2) weeks after analysis.

Results report to: David F.
Appendix C

AHERA Certifications & Laboratory Qualifications
AIHA Laboratory Accreditation Programs, LLC

acknowledges that

NVL Laboratories, Inc.
4708 Aurora Avenue N., Seattle, WA 98103
Laboratory ID: 101861

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, General Requirements for the Competence of Testing and Calibration Laboratories in the following:

LABORATORY ACCREDITATION PROGRAMS

✓ INDUSTRIAL HYGIENE
✓ ENVIRONMENTAL LEAD
✓ ENVIRONMENTAL MICROBIOLOGY
☐ FOOD
✓ UNIQUE SCOPES

Accreditation Expires: 05/01/2015
Accreditation Expires: 05/01/2015
Accreditation Expires: 05/01/2015
Accreditation Expires: 05/01/2015

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached Scope of Accreditation. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached Scope of Accreditation. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Larry S. Pierce
Chairperson, Analytical Accreditation Board

Cheryl O. Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 13: 03/12/2013

Date Issued: 03/29/2013
Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 102063-0

NVL Laboratories, Inc.
Seattle, WA

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

BULK ASBESTOS FIBER ANALYSIS

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).

2014-10-01 through 2015-09-30

Effective dates

For the National Institute of Standards and Technology

NVLAP-01C (REV. 2009-01-28)
SCENE OF ACCREDITATION TO ISO/IEC 17025:2005

NVL Laboratories, Inc.
4708 Aurora Avenue N.
Seattle, WA 98103
Mr. Nghiep Vi Ly
Phone: 206-547-0100  Fax: 206-634-1936
E-Mail: nick.l@nvllabs.com
URL: http://www.nvllabs.com

BULK ASBESTOS FIBER ANALYSIS (PLM)  NVLAP LAB CODE  102063-0

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<tr>
<td>18/A01</td>
<td>EPA 600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples</td>
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<tr>
<td>18/A03</td>
<td>EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials</td>
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2014-10-01 through 2015-09-30

For the National Institute of Standards and Technology

Page 1 of 1
Certificate of Completion

This is to certify that

David J. Fiala

has satisfactorily completed

4 hours of refresher training as an

Asbestos Building Inspector to comply with the training requirements of

TSCA Title II / 40 CFR 763 (AHERA)

Date(s) of Training: Apr 1, 2015
Exam Score: NA
Expiration Date: Mar 31, 2016

PACIFIC
TRAINING-CONSULTING

ARGUS

Certificate Number: 150602

EPA Provider Cert. Number: 1085

Instructor: [Signature]

Argus Pacific, Inc. • 1900 W. Nickerson, Suite 315 • Seattle, Washington • 98119 • 206-285-3373 • fax: 206-285-3977
SECTION 00 41 00
BID FORM

Bidder's Firm Name: __________________________ Date: __________

Address: __________________________________________

__________________________________________________

Telephone No.: ________________________________

TO: City of Kirkland
123 5th Avenue
Kirkland, WA 98033

Juanita Beach Park Bathhouse
9703 NE Juanita Drive, Kirkland, WA 98034
CIP NO. PKC 0119 100
JOB NO. 51-19-PW

GENERAL PROPOSAL

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this proposal are those named herein; that this proposal is in all respects fair and without fraud; that it is made without collusion with any official or employee City of Kirkland; and that the proposal is made without any connection or collusion with any person making another proposal on this contract.

The Bidder further declares that they have carefully examined the contract documents for the construction of the project; that they have personally inspected the site; that they have satisfied themselves as to the quantities involved, including materials and equipment and conditions of work involved, including the fact that the description of the quantities of work materials, as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the contract documents; and that this proposal is made according to the provisions and under the terms of the contract documents, which documents are hereby made a part of this proposal.

The Bidder further agrees that they have exercised their own judgment regarding the interpretation of subsurface information and have utilized all data which they believe is pertinent from the Architect, Owner and other sources in arriving at his/her conclusions.

The Bidder agrees to hold their bid proposal open for forty-five (45) days after the actual date of bid opening and to accept the provisions of the Instructions to Bidders regarding disposition of bid bond.

The Bidder agrees that if this bid is accepted through Award of Contract by Council, it will, within ten (10) calendar days after notification of acceptance, execute the contract with the Owner in the form of contract included in the contract documents, and will, at the time of execution of the Contract, deliver to the Owner the Performance and Payment Bonds and all Certificates of Insurance required therein, and will, to the extent of its proposals, furnish all machinery, tools, apparatus, and other means of construction and do the work in the manner, in the time, and according to the requirements as specified in the contract documents and required by the engineer/architect or other project manager designated thereunder.
TIME OF COMPLETION:

The undersigned agrees, if awarded the contract, to commence work within 10 days of the signing and execution of the contract by the Owner and Contractor and receipt of the Notice to Proceed. The undersigned understands and agrees that Substantial Completion of the work shall be no later than 195 calendar days thereafter, and that Final Completion of the work shall be no later than 30 calendar days after Substantial Completion.

PERMITS, FEES AND INSPECTIONS:

The Owner will apply for and pay any required permits including demolition, plumbing, electrical, and mechanical permits and utility connection fees. (The general building permit and the shoreline permit are complete and paid for.) Utility connection fees, if incurred by the contractor to facilitate the work, shall be paid back to the contractor by the Owner within the contract document change order process without markup of any kind. All other City of Kirkland and other State of Washington or local agency permits and requirements are the financial and administrative responsibility of the Contractor at no cost to the City of Kirkland.

The Contractor shall be responsible for scheduling, application and acquisition of all permits and inspections not specifically identified above.

BASE BID:

The Bidder further proposes to accept as full payment for the work proposed herein the amounts computed under the provisions of the contract documents and based upon the bid price for fully completed work as included in the proposal and the Bid Price represents a true measure of the labor, equipment, and materials required to perform and complete the work, including all allowances for overhead and profit for each type of work called for in these contract documents, as well as all use taxes, overhead, profit, bond premiums, insurance premiums and all other miscellaneous and incidental expenses. The amounts shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern.

The undersigned bids for complete construction of the Juanita Beach Bathhouse Project as follows:

For the **Total for Base Bid including applicable sales tax at the current rate where the project resides**, the sum of:

$_________________________ DOLLARS

(Please print dollar amount in words in space above for base bid including sales tax.)

$_________________________ (Please write dollar figure in space above including sales tax.)

ALL REQUIRED

Trenching is included in the Total for Base Bid above. The bidder shall enter in the blank space provided below; the dollar amount the bidder has included in its Total for Base Bid for any work requiring trenching that will exceed a depth of 4'-0". If trenching excavation safety provisions do not pertain to the project the Bidder should enter “N.A.” or “Not Applicable” in the following blank $_____________. **The bidder must fill in the blank.**
SECTION 00 41 00
BID FORM

Allowance at Owner’s Discretion. The Bidder shall include in the base bid above the lump sum, inclusive of sales tax, of $100,000, to be used to pay for work not shown in the documents but to be completed at the direction of the Owner. At the end of the work, the contract amount will be reduced by the amount of this Allowance which is not used.

ADDENDA
Receipt of the following Addenda is hereby acknowledged.

Addendum No. ___________ dated __________________________
Addendum No. ___________ dated __________________________
Addendum No. ___________ dated __________________________
Addendum No. ___________ dated __________________________

Within the three-year period immediately preceding the date of the bid solicitation for this Project, bidder has not been determined by a final and binding citation and notice of assessment issued by the department of labor and industries or through a civil judgment entered by a court of limited or general jurisdiction to have willfully violated, as defined in RCW 49.48.082, any provision of chapter 49.46, 49.48, or 49.52 RCW.

I certify (or declare) under penalty of perjury under the laws of the State of Washington that the foregoing is true and correct:

_________________________________________________
CONTRACTOR (Firm Name)

By (Signature) ___________________________ Printed Name/Title of Signatory

(Indicate whether Contractor is Partnership,

Washington State Contractor's
Registration Number ___________________________

Contractor's Industrial Insurance
Account Number ___________________________

Contractor's Address:

_________________________________________________

Telephone Number ___________________________

Fax Number ___________________________

BID FORM TO BE SUBMITTED IN A SEALED ENVELOPE
END OF SECTION
BID DEPOSIT

Herewith find deposit in the form of a cashier's check or certified check in the amount of
$___________________which amount is not less than five percent (5%) of the total bid.

SIGN HERE__________________________________

BID BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, ______________________________________________________________, as Principal, and
______________________________________________________________________, as Surety, are

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

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

Project Name ____________________________ Job Number ____________________________

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

SIGNED, SEALED AND DATED THIS _______________ DAY OF __________________, 20______.

PRINCIPAL:  SURETY:

________________________________________________________________________

________________________________________________________________________

Note: If a Bid Bond is provided, it must be accompanied by a power of attorney which appoints the
Surety's true and lawful attorney-in-fact to make, execute, seal and deliver this Bid Bond.

BID PROPOSAL -1 -
SECTION 00 44 00
SUB-CONTRACTOR LISTING

Bidder's Name: _______________________________________________________

Failure to list subcontractors with whom the bidder, if awarded the contract, will directly subcontract for performance of the work of heating, ventilation and air conditioning, plumbing, as described in Chapter 18.106 RCW, and electrical, as described in Chapter 19.28 RCW or naming more than one subcontractor to perform the same work will result in your bid being non-responsive and therefore void.

Subcontractor(s) with whom the bidder will directly subcontract that are proposed to perform the work of heating, ventilation and air conditioning, plumbing, as described in Chapter 18.106 RCW, and electrical as described in Chapter 19.28 RCW must be listed below. The work to be performed is to be listed below the subcontractor(s) name.

To the extent the Project includes one or more categories of work referenced in RCW 39.30.060, and no subcontractor is listed below to perform such work, the bidder certifies that the work will either (i) be performed by the bidder itself, or (ii) be performed by a lower tier subcontractor who will not contract directly with the bidder. Per RCW 39.30.060, this form is required to be completed if the estimated bid amount exceeds $1,000,000.

Subcontractor Name: _______________________________________________________
Work to be Performed: _______________________________________________________

Subcontractor Name: _______________________________________________________
Work to be Performed: _______________________________________________________

Subcontractor Name: _______________________________________________________
Work to be Performed: _______________________________________________________

Subcontractor Name: _______________________________________________________
Work to be Performed: _______________________________________________________

Bidder's Signature           Date

Bidders are notified that is the opinion of the enforcement agency that PVC or metal conduit, junction boxes, etc, are considered electrical equipment and therefore considered part of electrical work, even if the installation is for future use and no wiring or electrical current is connected during the project.

END OF SECTION
SECTION 00 45 70
RETAINAGE INVESTMENT OPTION

CONTRACTOR:

PROJECT NAME:

DATE:

Pursuant to R.C.W. 60.28.010, as amended, you may choose how your retainage under this contract will be held and invested. Please complete and sign this form indicating your preference. If you fail to do so, the Owner will hold your retainage as described in "Current Expense" option 1 below.

___1. Current Expense: The Owner will retain your money in its Current Expense Fund Account until thirty days following final acceptance of the improvement or work as completed. You will not receive interest earned on this money.

___2. Interest Bearing Account: The Owner will deposit retainage checks in an interest-bearing account in a bank, mutual savings bank, or savings and loan association, not subject to withdrawal until after the final acceptance of the improvement or work as completed or until agreed to by both parties. Interest on the account will be paid to you. Any fees incurred shall be the responsibility of the contractor.

___3. Escrow/Investments: The Owner will place the retainage checks in escrow with a bank or trust company until thirty days following the final acceptance of the improvement or work as completed. When the moneys reserved are to be placed in escrow, the Owner will issue a check representing the sum of the moneys reserve payable to the bank or trust company and you jointly. This check will be converted into bonds and securities chosen by you and approved by the Owner and these bonds and securities will be held in escrow. Interest on these bonds and securities will be paid to you as interest accrues.

The Contractor in choosing option (3) agrees to assume full responsibility to pay all costs which may accrue from escrow services, brokerage charges or both, and further agrees to assume all risks in connection with the investment of the retained percentages in securities.

___4. Bond-in-Lieu: With the consent of the Owner, the contractor may submit a bond for all or any portion of the amount of funds retained by the Owner in a form and from an authorized surety insurer acceptable to the Owner. Such bond and any proceeds therefrom shall be made subject to all claims and liens and in the same manner and priority as set forth for retained percentages in this chapter. The Owner shall release the bonded portion of the retained funds to the contractor within thirty days of accepting the bond from the contractor. Whenever an Owner accepts a bond in lieu of
retained funds from a contractor, the contractor shall accept like bonds from any subcontractors or suppliers from which the contractor has retained funds. The contractor shall then release the funds retained from the subcontractor or supplier to the subcontractor or supplier within thirty days of accepting the bond from the subcontractor or supplier.

Retainage is normally released 30 days after Final Acceptance of the work, or following receipt of Labor and Industries/Department of Revenue clearance, whichever date is the later. Retainage on landscaping work may be retained longer, due to its seasonal nature. State law allows for limited early release in certain circumstances.

**CONTRACTOR:**

Signature: ________________________________

Print or Type Name: ___________________________

Title: ________________________________

Date: ________________________________

**THIS FORM TO BE EXECUTED AFTER CONTRACT IS AWARDED**

**END OF SECTION**
THIS AGREEMENT is made and entered into this _______ day of ________, 20___ by and between the City of Kirkland, Washington, a municipal corporation of the State of Washington, hereinafter referred to as “City” and ____________________, hereinafter referred to as “Contractor” effective as of the date of the first signature on the agreement so long as all other parties’ authorized signatories have also executed the Agreement.

In consideration of the mutual covenants and obligations contained herein, the City and Contractor agree as follows:

1. **Agreement.** The “Contract Documents” form the “Contract.” The Contract Documents consist of this Agreement, any attached Exhibits, the Project Manual, including the General Conditions; Supplemental Conditions, if any, Special Provisions, if any, the Specifications, Contract Plans, and Amendments to the Specifications; and written modifications, amendments and Change Orders to the Contract issued after execution of this Agreement, the City’s Contract Bid Documents for the Project, including but not limited to the Bid package, Instructions to Bidder, Addenda, Proposal Form, Contractor’s Proposal and all documents submitted therewith in response to the City’s Invitation to Bid, and any additional documents referenced as comprising the Contract and Contract Documents, which are hereby fully incorporated as part of the Contract as if set forth herein.

2. **Project.** Contractor shall fully complete all Work and furnish all labor, tools, materials, and equipment for the project entitled __________________, Project No. ______________, including all changes to the Work and force account work, timely and in strict accordance with the Contract Documents.

3. **Payments.** In consideration of full and faithful compliance with the terms and conditions of this agreement and the Contract Documents, the City shall pay Contractor, at the times and in the manner provided in the Contract Documents, the total sum of ________________________ Dollars ($____________), which sum is subject, however, to increase or decrease in such proportion as the quantities for unit price items set forth in the Bid Proposal Form are so changed as set forth in the Contract Documents or as modified by an approved Change Order or addendum as permitted by the Contract Documents. The payments to Contractor include the costs for all labor, tools, materials, equipment, and subcontracts for the Work.

4. **Completion Date.** The Contract Time shall be measured from the Notice to Proceed date to the date of Substantial Completion, subject to adjustments of the Contract Time as provided in the Contract Documents. Time is of the essence in completion of the Work. Contractor shall achieve Substantial Completion of the Work by __________, subject to adjustments of this Contract Time as provided in the Contract Documents, and shall achieve Final Completion not later than thirty (30) Days thereafter. Contractor represents to the City that the Contract Time is adequate for full performance of the Work. Contractor shall also achieve any interim milestones and phasing requirements set forth in the Contract Documents. If the physical Work under this Agreement is not completed within the time
specified, Contractor shall pay liquidated damages and all engineering inspection and supervisions costs to the City as specified in the Contract Documents.

5. **Liquidated damages.** The City will assess, and Contractor will be responsible for, liquidated damages in the amount of $1000.00 per Day for each Day beyond the Contract Time that Substantial Completion is not timely achieved and $500.00 per Day beyond the Contract Time that Final Completion is not timely achieved. Contractor and the City agree that any liquidated damages established by this Agreement are not penalties and are a reasonable estimation of actual damages to the City, as of this date of Agreement, based on the inherent uncertainty and difficulty in calculating and quantifying damages caused by delays in the construction of the Project. This provision is intended to be in lieu of Contractor’s liability for delay damages sustained by Owner by reason of Contractor’s delay in reaching Substantial Completion by the date set for Substantial Completion. This provision shall not relieve or release Contractor from liability occasioned by other breaches or defaults under this Contract, nor shall it limit Owner’s rights to terminate the Contract for cause pursuant to the General Conditions or to pursue any other remedy under the Contract or otherwise. In addition, Owner may recover its actual damages (including direct architectural, administrative, and other related costs attributable to the Project) as a result of any delay by Contractor in reaching Final Completion within the time required in Paragraph 4 above.

6. **Independent Contractor.** Contractor’s employees, while engaged in the performance of any of Contractor’s services under this Agreement, shall be considered employees of the Contractor and not employees, agents, representatives of the City and as a result, shall not be entitled to any coverage or benefits from the City. Contractor’s relation to the City shall be at all times as an independent contractor. Any and all Workman’s Compensation Act claims on behalf of Contractor employees, and any and all claims by third-party as a consequence of any negligent act or omission on the part of Contractor’s employees, while engaged in services provided to be rendered under this Agreement, shall be solely Contractor’s obligation and responsibility.

7. **Jurisdiction and Venue.** Any lawsuit or legal action brought by any party to enforce or interpret this Agreement or any of its terms or covenants shall be brought in King County Superior Court for the State of Washington.

8. **Contract is complete and integrated agreement.** The Contract represents the entire, complete, and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. No oral representations or other agreements have been made by the parties except as specifically established in the Contract.

9. **Severability.** A court of competent jurisdiction’s determination that any provision or part of this Agreement is illegal or unenforceable shall not cancel or invalidate the remainder of this Agreement, which shall remain in full force and effect. In such event a provision is determined void or unenforceable, the parties agree to negotiate a replacement provision to enable that party to receive the benefit as nearly as possible as to what it would have received but for the determination that a provision was illegal or unenforceable.
10. **Disclaimer.** No liability of Contractor shall attach to the City by reason of entering into this Agreement, except as expressly provided in this Agreement.

In witness whereof, the City, as approved by the City Council, and Contractor have executed this agreement by their proper officers or duly authorized agents

Dated: ____________________________  Dated: ____________________________

City of Kirkland       [Contractor Name] (Contractor)

By: ____________________________  By: ____________________________

Its: ____________________________  Its: ____________________________

Attention: If Contractor is a corporation, the name of the corporation should be listed in full and both the President and Secretary must sign the contract. OR, if one signature is permitted by corporation by-laws, a copy of the by-laws shall be furnished to the City and made part of the Contract Documents.

If the business is a partnership, the full name of each partner should be listed followed by d/b/a and the firm or trade name. Any one partner may sign the Contract.

If the business is a limited liability company, an authorized management member or manager must sign followed by his/her title.

(For corporations, LLC’s and other legal entities)

STATE OF WASHINGTON  )
COUNTY OF KING   )

On this day before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared ____________________________, to me known to be the ____________________________ of ____________________________, the legal entity that executed the foregoing instrument, and acknowledged the said instrument to be the free and voluntary act and deed of said legal entity, for the uses and purposes therein set forth, and on oath stated that he/she was authorized to sign said instrument.

Given under my hand and official seal this ______ day of ________________, 20__.

Print Name: ____________________________

NOTARY PUBLIC in and for the State of Washington, residing __________
Commission expires: __________

(For individuals and d/b/a’s)

STATE OF WASHINGTON  )
On this day before me, the undersigned, a Notary Public in and for the State of Washington, duly commissioned and sworn, personally appeared ________________________ and __________________________________ to me known to be the individual(s) described herein and who executed the foregoing instrument, and acknowledged that he/she/they signed the same as his/her/their free and voluntary act and deed, for the uses and purposes therein mentioned.

Given under my hand and official seal this ______ day of ____________, 20__.  

__________________________________________________________
Print Name: __________________________________________
NOTARY PUBLIC in and for the State of Washington, residing _________
Commission expires: _________

END OF SECTION
The bond and insurance requirements set forth on the following pages are required of the successful bidder.

1.01 **GENERAL:** In addition to the Bid Security, the City of Kirkland requires the Contractor to furnish the following bonds and insurance. The insurance coverage shall be maintained during the life of the Contract and for not less than one year thereafter.

1.02 **EVIDENCE OF COMPLIANCE:**

   A. **Performance Bond:** Submitted at time of execution of the Contract and attached thereto.

   B. **Labor, Materials, and Taxes Bond:** Submitted at time of execution of the Contract and attached thereto.

   B. **Insurance:** A Certificate of Insurance shall be filed with “City of Kirkland.” This Certificate shall be reflective of all Insurance Coverage required by the City’s Contract Documents. Any Certificate filed with the City of Kirkland found to be incomplete or not according to Form, will be returned as not satisfactory. Rejected Certificates shall be corrected as necessary and resubmitted to the City of Kirkland.

Certificates of Insurance shall indicate the following to be Additional Named Insureds:

   - City of Kirkland; It’s officers, elected officials, employees, agents, and volunteers
   - Consultants hired by the City of Kirkland to administer the construction
   - The Architect/Engineer of Record

In addition to the foregoing, the Certificate of Insurance must include a Cancellation Notification of not less than forty-five (45) days. The Certificate should also contain the Contract Number and a “concise verbal definition” of the Contract to which the Certificate applies.

1.03 **INSURANCE GENERALLY:** The Contractor shall not commence work under this contract until he has obtained the insurance required hereunder and such insurance has been approved by the City of Kirkland. In like manner, the General Contractor shall not allow any subcontractor to commence work on any subcontract until the subcontractor has submitted to the General Contractor a Certificate of Insurance reflective of the coverage required by the City of Kirkland. The City of Kirkland’s approval of insurance shall not relieve or decrease the Contractor’s liability hereunder. Each policy shall contain an endorsement stating that the insurance company will not, prior to the completion of the Work or any expiration date shown on the policy and certificate, whichever occurs first, terminate the policy or change any coverage therein without first mailing, by registered mail, written notice of such action at least thirty (30) days prior to the termination or change, to the City of Kirkland. Certificate shall be issued on an ACORD Form, or a form that meets with the City of Kirkland’s approval.
The Insuring Company shall have a Best Rating of A, or meet with the City of Kirkland's approval.

The "Cancellation" Block shall be altered to include the wording "Should any of the above described policies be canceled or materially reduced before expiration date thereof, the issuing company will mail 30 days written notice to the certificate holder named to the left."

1.04 CONTRACTOR'S LIABILITY INSURANCE: The insurance required by the City of Kirkland is as specified below and in the amounts indicated:

A. Worker's Compensation and Employer's Liability Insurance: All employees of the Contractor and subcontractors shall be insured under Washington State Industrial Insurance. Employees not subject to the State Act shall be insured under Employer's Liability with a $2,000,000.00 limit of liability. A separate Certificate of Insurance shall be furnished to the City of Kirkland if any of the Contractor's payroll is not reported to the Washington State Industrial Insurance. The contractor shall be responsible for confirming compliance of all subcontractors with the above requirements.

B. Comprehensive General Liability and Comprehensive Automobile Liability Insurance: The Contractor shall obtain and retain Bodily Injury and Property Damage Liability Insurance providing the following:
   1. Additional Insured: City of Kirkland, and the Architect/Engineer of Record shall be named as additional insured for liability arising out of the work of this Contract as a result of the negligence, real or alleged, on the part of the contractor and his subcontractors.
   2. Limits of Liability: The minimum acceptable General Liability Limit shall be $5,000,000 Aggregate/$2,000,000 Occurrence. Coverage shall include owners & Contractors Protective Liability and Employers Liability (Stop-Gap) Coverage. The minimum acceptable Automobile Liability Limit shall be $2,000,000. The Owner does not represent that the minimum required insurance coverage or limits are adequate to protect Contractor from all liabilities.
   3. Coverage: Coverage shall be written on an "Occurrence" Basis, or meet the City of Kirkland's approval. Coverage shall be as is usual to the practice of the Insurance Industry; included but not limited to the following coverages:
      a. Premises and Operations including Explosion, Collapse and Underground Liability;
      b. Products and completed Operations;
      c. Owners and Contractors Protective Liability;
      d. Broad form Property Damage Liability;
      e. Blanket Contractual Liability;
      f. Personal Injury Liability, including coverage’s A, B, and C;
      g. Employers “Stop-Gap” Liability;
      h. Automobile Liability for All Owned, Non-Owned, Hired Leased or Borrowed Vehicles. Automobile Coverage shall include "Any Auto" or "Scheduled Autos" and shall include Hired and Non-Owned Auto Liability;
      i. Un-insured and Under-insured Motorist Coverage should also be in effect.
   4. Products and Completed Operations Insurance: The minimum acceptable Annual Aggregate for Products and Completed Operations Liability shall be $5,000,000. This coverage must be maintained for a period of not less than three years after the final acceptance of the work performed.
5. Professional Liability: The minimum acceptable coverage for Professional Liability shall be $1,000,000, if applicable.

1.05 PROPERTY INSURANCE: The Contractor shall purchase and maintain property insurance upon the entire Work at the site to 115 percent of the full value thereof. This insurance shall include the interests the City of Kirkland, the Contractor, and all subcontractors in the Work being performed. The coverage shall be written on a “Builder's Risk” basis. All materials which are to be made part of the construction project are to be so insured while being stored at or off the job site(s) and/or while being transported to and from the job site(s). Insurance against loss of tools, equipment, construction, or otherwise not to be incorporated into the Work is the responsibility of the Contractor and the cost of such insurance shall not be included in the cost of insurance required herein before.

A. Waiver: City of Kirkland and the Contractor waive all rights against (1) each other and the subcontractors, sub-subcontractors, agents and employees each of the other, and (2) the Owner for damages caused by fire or other perils to the extent covered by insurance obtained pursuant to this Article or any other property insurance applicable to the Work, except such rights as they may have to the proceeds of such insurance held by the City of Kirkland, as trustee.

1.06 BONDS

A. Performance and Payment Bond: Furnish surety bond (Section 00 61 40) in an amount equal to 100 percent of the Contract Sum covering faithful performance of the work and payment of labor and materials. Furnish bonds issued by a bonding company licensed to transact business in the locality of the Work and approved by the Owner. The bond must state that it is provided pursuant to Ch. 39.08 RCW.

END OF SECTION
CITY OF KIRKLAND
Juanita Beach Park Bathhouse

PERFORMANCE BOND
FORM

SECTION 00 61 40

SURETY TO HAVE AN A.M. BEST RATING OF A:VII OR BETTER.

Bond No. ___________________________

KNOW ALL PERSONS BY THESE PRESENTS, that _______________ (Contractor), as Principal, and ____________________________, (insert name of surety), as Surety, a corporation duly organized under the laws of the State of ______________, (insert Surety's state of incorporation), and authorized to do business as a surety in the State of Washington, are held and firmly bound unto the City of Kirkland (City) in the sum of _________________________ dollars ($_____________), lawful money of the United States of America, plus the total amount of extra orders issued by the City to the Principal pursuant to the terms of the Contract referred to in the next succeeding paragraph hereof, for the payment whereof Principal and Surety bind ourselves, and our heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has been awarded, and is about to enter into, a written Contract with the City for

PROJECT NAME: Juanita Beach Park Bathhouse, which is hereby made a part of this bond as if fully set forth herein;

NOW, THEREFORE, the condition of this bond is such that:

1. If the Principal shall completely and faithfully perform all of its obligations under the Contract, including any warranties required thereunder, and all modifications, amendments, additions, and alterations thereto, including modifications which increase the contract price or time for completion, with or without notice to the surety;

2. If the Principal shall indemnify and hold the City harmless from any and all losses, liability, damages, claims, judgments, liens, costs, and fees of any type that the City may be subject to because of the failure or default of the Principal (a) in performance of any of the terms, conditions, or obligations of the Contract, including all modifications, amendments, additions, and alterations thereto, and any warranties required thereunder, and/or (b) in the payment for labor, equipment, and materials by satisfying all claims and demands incurred under the Contract, and reimbursing and paying Owner all expenses that Owner may incur in making good any default by the Principal; and

3. If the Principal shall indemnify and hold the City harmless from all claims, liabilities, causes of action, damages and costs, including property damages and personal injuries, resulting from any defect appearing or developing in the material provided or workmanship performed under the Contract;

THEN THIS obligation shall be null and void; otherwise to remain in full force and effect. If the City shall declare Principal to be in default of the Contract, and shall so notify Surety, Surety shall, within a reasonable time which shall not exceed 14 days, except for good cause shown, notify the City in writing of the manner in which surety will satisfy its obligations under this Bond.

Nonpayment of the Bond premium will not invalidate this Bond nor shall the City be obligated for the payment thereof. The Surety hereby waives notice of any modification of the Contract or extension of time made by the City.

Signed this ________ day of ________________________, 20__.  

Principal: ________________________________  
By: ________________________________  
Title: ________________________________  
Address: ________________________________  
City/Zip: ________________________________  
Telephone: ________________________________

Surety: ________________________________  
By: ________________________________  
Title: ________________________________  
Address: ________________________________  
City/Zip: ________________________________  
Telephone: ________________________________

Note: A power of attorney must be provided which appoints the Surety's true and lawful attorney-in-fact to make, execute, seal and deliver this performance bond.
LABOR, MATERIAL, AND TAXES BOND (PAYMENT BOND)

Surety to have an A.M. Best rating of A:VII or better.

Bond No. _______________________________________

KNOW ALL PERSONS BY THESE PRESENTS, that, _________________ (Contractor), as Principal, and _________________________________________, (insert name of surety), as Surety, a corporation duly organized under the laws of the State of _________________ (insert Surety’s state of incorporation), and authorized to do business as a surety in the State of Washington, are held and firmly bound unto the City of Kirkland (City) for the use and benefit of claimants as hereinafter defined, in the sum of ________________________ Dollars ($__________), lawful money of the United States of America, plus the total amount of any extra orders issued by the City, for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has been awarded, and is about to enter into, a Contract with City of Kirkland for PROJECT NAME: Juanita Beach Park Bathhouse, which contract is by this reference made a part hereof;

WHEREAS, the contract is a public works contract, subject to the provisions of RCW Titles 39 and 60;

NOW, THEREFORE, the conditions of this obligation are such that, if the Principal shall promptly make payment to all claimants as hereinafter defined, for (a) all labor and material used or reasonably required for use in the performance of the contract and (b) all taxes, increases, and penalties incurred on the above-referenced contract under Titles 50, 51, and 82 RCW which may be due, then this obligation shall be void; otherwise, it shall remain in full force and effect, subject, however, to the following conditions: A claimant is defined as and includes (a) a person claiming to have supplied labor or materials for the prosecution of the work provided for in the contract, including any person having direct contractual relationship with the contractor furnishing the bond or direct contractual relationship with any subcontractor, or an assignee of such person, (b) the state with respect to taxes incurred on the above-referenced contract under Titles 50, 51, and 82 RCW which may be due and (c) any other person or entity as allowed or required by law.

1. The Principal and Surety hereby jointly and severally agree with the City that every claimant as herein defined, who has not been paid in full prior to Final Acceptance of the project, or materials were furnished by such claimant, has an action on this bond for such sum or sums as may be justly due claimant, and may have execution thereon. The City shall not be liable for the payment of any costs or expenses of any such suit or action.

(Form continues on next page)
2. No suit or action shall be commenced hereunder by any claimant (except the state with respect to taxes, increases, and penalties incurred on the above-referenced contract under Titles 50, 51, and 82 RCW which may be due) unless the claimant has sent the written notice required under RCW Title 39 to the Principal and to the City’s Purchasing Agent by registered or certified mail, or by hand delivery, no later than 30 days after Final Acceptance of the Project.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against the improvement, whether or not claim for the amount of such lien be presented under and against this bond.

The Surety hereby waives notice of any modification of the contract or extension of time made by the City.

Signed this __________________ day of __________________, 20____
Principal: ___________________________ Surety: ___________________________
By: ________________________________ By: ________________________________
Title: ______________________________ Title: ______________________________
Address: ___________________________ Address: ___________________________
City/Zip: ___________________________ City/Zip: ___________________________
Telephone: ( ) ____________________ Telephone: ( ) ______________________

Note: A power of attorney must be provided which appoints the Surety's true and lawful attorney-in-fact to make, execute, seal and deliver this performance bond.

END OF LABOR, MATERIAL AND TAXES PAYMENT BOND FORM
GENERAL CONDITIONS

PART 1 – GENERAL TERMS

1.1 DEFINITIONS

A. “Application for Payment” means a written request submitted by Contractor to Owner for payment of Work completed in accordance with the Contract Documents and approved Schedule of Values, supported by such substantiating data as Owner may require.

B. “Architect,” “Engineer,” or “A/E” means a person or entity lawfully entitled to practice architecture or engineering, representing Owner within the limits of its delegated authority.

C. “Award of Contract” refers to City of Kirkland Council’s acceptance of the Contractor’s Bid. Council Award, or Bid Rejection, will occur within 45 calendar days after Bid opening. If the lowest responsible Bidder and the City of Kirkland agree, this deadline may be extended. If they cannot agree on an extension by the forty-five (45) calendar day deadline, the City of Kirkland reserves the right to Award the Contract to the next lowest responsible Bidder or reject all Bids. The City of Kirkland will notify the successful Bidder of the Contract Award in writing.

D. “Change Order” means a written instrument signed by Owner and Contractor stating their agreement upon all of the following: (1) a change in the Work; (2) the amount of the adjustment in the Contract Sum, if any, and (3) the extent of the adjustment in the Contract Time, if any.

E. “Claim” means Contractor’s exclusive remedy for resolving disputes with Owner arising out of or relating to the Contract Documents or the breach thereof or requesting an adjustment in the Contract Sum or Contract Time. As used in the Contract Documents, the exclusive meaning of “equitable adjustment” is the ability of Contractor to follow the contractual dispute resolution process as set forth herein, including the requirement for submitting a timely Notice, substantiation, and Claim.

F. “Construction Change Directive” (“CCD”) is a written order prepared by Owner that directs Work prior to total agreement on adjustment, if any, in the Contract Sum or Contract Time, or both.

G. The “Contract” is the agreement between Owner and Contractor and is formed by the Contract Documents. The Contract represents the entire and integrated agreement between Owner and Contractor and supersedes prior negotiations, representations or agreements, either written or oral.

H. “Contract Award Amount” is the sum of the Base Bid and any City accepted Alternates, including applicable sales tax at the current rate where the project resides.
I. “Contract Documents” includes the Executed Agreement, General Conditions, modifications to the General Conditions, Supplementary and Special Conditions, Drawings and Specifications, the Project Manual, the Bonds and Insurance Certificate Requirements provided in the Bid Documents, and all addenda and modifications thereof.

J. “Contract Sum” is the total amount payable by Owner to Contractor for performance of the Work in accordance with the Contract Documents, including all taxes imposed by law and properly chargeable to the Work, including applicable sales tax at the current rate where the project resides.

K. “Contract Time” is the number of calendar days allotted in the Contract Documents from the Notice to Proceed for achieving Substantial Completion of the Work.

L. “Contractor” means the person or entity who has agreed with Owner to perform the Work in accordance with the Contract Documents.

M. “Day(s)” means calendar day(s) unless otherwise specified.

N. “Drawings” are the graphic and pictorial portions of the Contract Documents showing the design, location, and dimensions of the Work, and may include plans, elevations, sections, details, schedules, and diagrams.

O. “Final Acceptance” means the written acceptance of the Work by Owner, as more fully set forth in Section 6.

P. “Final Completion” means that the Work is fully and finally complete in accordance with the Contract Documents and Contractor has submitted its final Application for Payment, as more fully set forth in Section 6.

Q. “Force Majeure” means those acts entitling Contractor to request an equitable adjustment in the Contract Time, as more fully set forth in Section 3.

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

S. “Notice to Proceed” means a written Notice from Owner to Contractor that permits pre-construction and construction activities to commence upon specified terms and defines the date on which the Contract Time begins to run.

T. “Owner” means the City of Kirkland, a municipal corporation, which has the authority to enter into, administer, and/or terminate the Work in accordance with the Contract Documents. Owner shall designate in writing a Representative who shall have authority to bind Owner with respect to all matters requiring Owner’s approval or authorization. A/E does not have such authority.

U. “Person” means a corporation, partnership, business association of any kind, trust, company, or individual.
V. “Prior Occupancy” means Owner’s use of all or parts of the Project before Substantial Completion, as more fully set forth in Section 6.

W. “Project Manual” means all Bid Documents, Contract Documents, General Conditions, Supplementary Conditions, if any, Specifications, Special Provisions, if any, and Addenda, if any.

X. “Progress Schedule” means a schedule of the Work, in a form satisfactory to Owner, as further set forth in Section 3.

Y. “Project” means the total construction of which the Work performed in accordance with the Contract Documents may be the whole or a part and which may include construction by Owner or by separate contractors.

Z. “Schedule of Values” means a written breakdown allocating the total Contract Sum to each principal category of Work, in such detail and format as requested by Owner.

AA. “Specifications” are that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction systems, standards and workmanship for the Work, and performance of related services. Specifications are prepared in sections which conform generally with trade practices. These sections are for Owner and Contractor convenience and shall not control Contractor in dividing the Work among the Subcontractors or in establishing the extent of the Work to be performed by any trade.

BB. “Subcontract” means a contract between Contractor and a Subcontractor for the purpose of obtaining supplies, materials, equipment, work or services of any kind for or in connection with the Work.

CC. “Subcontractor” means any Person of any tier, other than Contractor, who agrees to furnish or furnishes by contract with, or through Contractor, any supplies, materials, equipment, or services of any kind in connection with the Work.

DD. “Substantial Completion” means that stage in the progress of the Work (or portion of the Work designated and approved by Owner) when the construction is sufficiently complete, in accordance with the Contract Documents, so that Owner can fully occupy or utilize the Work (or portion designated by Owner) for its intended use, as more fully set forth in Section 6. There may be separate dates of Substantial Completion specified in the Contract Documents for various phases or portions of the Work.

EE. “Work” means the construction and services required by the Contract Documents, and includes, but is not limited to, labor, materials, supplies, equipment, services, permits, and the manufacture and fabrication of components, performed, furnished, or provided in accordance with the Contract Documents.

FF. “Work Site” means the space identified and circumscribed on construction documents. The work site is controlled by the Contractor and the Contractor is responsible for compliance to regulatory requirements within the circumscribed area. Changes to the work site shall be submitted by Contractor and approved by Owner.
1.2 ORDER OF PRECEDENCE

Any conflict or inconsistency in the Contract Documents shall be resolved by giving the documents precedence in the following order, with a revision to a Contract Document having precedence over the original document and a later document having precedence over an earlier document:

1. Executed Agreement, including any Change Orders.
2. Supplementary Conditions.
3. Special Conditions or Modifications to the General Conditions.
4. General Conditions
5. Specifications and Drawings. The Specifications and Drawings are complementary and shall have equal precedence. Thus, anything mentioned in the Specifications but not shown on the Drawings, or shown on the Drawings but not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both. If there is any inconsistency between the Specifications and Drawings, Contractor will make an inquiry to Owner to determine how to proceed. Unless otherwise directed, Contractor will provide the better quality or greater quantity of any Work or materials, as reasonably interpreted by Owner, at no change in the Contract Sum or Contract Time. In case of conflict within the Specifications, provisions in Division 1 shall take precedence over provisions of any other Division. In case of conflict within the Drawings, large scale Drawings shall take precedence over small scale Drawings.
6. Signed and Completed Bid Form
7. Instructions to Bidders
8. Advertisement for Bids

1.3 EXECUTION AND INTENT

Contractor Representations: Contractor makes the following representations to Owner:

1. **Contract Sum and Contract Time reasonable**: The Contract Sum is reasonable compensation for the Work and the Contract Time is adequate for the performance of the Work, as represented by the Contract Documents;

2. **Contractor familiar with Project**: Execution of the Contract by Contractor is a representation that Contractor has carefully reviewed the Contract Documents, visited and examined the Project site, become familiar with the local conditions in which the Work is to be performed, and satisfied itself as to the nature, location, character, quality and quantity of the Work, the labor, weather, materials, equipment, goods, supplies, work, services and other items to be furnished and all other requirements of the Contract Documents, as well as the surface and subsurface conditions and other matters that may be encountered at the Project site or affect performance of the Work or the cost or difficulty thereof; No allowance shall subsequently be made on behalf of
Contractor on account of error or negligence on its part or its failure to acquaint itself with the conditions of the site;

3. **Contractor financially capable**: Contractor is financially solvent, able to pay its debts as they mature, and possesses sufficient working capital to complete the Work and perform Contractor’s obligations required by the Contract Documents; and

4. **Contractor can complete the Work**: Contractor is able to furnish the plant, tools, materials, supplies, equipment and labor required to complete the Work and perform the obligations required by the Contract Documents and has sufficient experience and competence to do so.

**PART 2 – INSURANCE AND BONDS**

**2.1 CONTRACTOR’S LIABILITY INSURANCE**

General insurance requirements: Prior to commencement of the Work, Contractor shall obtain all the insurance required by the Contract Documents and provide evidence satisfactory to Owner that such insurance has been procured, including but not limited to (1) Certificates of Insurance, on ACORD Form 27 and/or ACORD Form 25-S, or other forms that are similarly binding on insurers, (2) the actual costs (expressed as a percentage) of Contractor’s liability insurance under Section 2.1A.1 below, (3) endorsements, including endorsements for additional insureds as listed in Section 2.1D below, (4) evidence of State Workers’ Compensation coverage, and (5) a copy of any builder’s risk policy required by the Contract Documents. All policies, endorsements and certificates must be signed copies and shall contain a provision that coverages afforded under the policies cannot be materially altered (i.e. the coverages reduced, the limits decreased or the additional insured removed) allowed to expire, or cancelled without first giving forty-five (45) days prior written Notice by certified mail to Owner. Contractor shall furnish to Owner copies of any subsequently issued endorsements amending, modifying, altering or restricting coverage limits. Review of Contractor’s insurance by Owner shall not relieve or decrease the liability of Contractor. Companies writing the insurance to be obtained shall be licensed to do business under Chapter 48 RCW or comply with the Surplus Lines Law of the State of Washington, and shall be acceptable to Owner.

Contractor shall include in the Contract Sum the cost of all insurance and bond costs required for the Work. Insurance carriers providing insurance shall be acceptable to Owner, and its A. M. Best rating shall be indicated on the insurance certificates.

A. **Term of insurance coverage**: Contractor shall maintain the following insurance coverage during the Work and for three years after Final Acceptance, with the exception of Professional Liability insurance, when required, which shall be maintained for a minimum of three years. Contractor shall also maintain the following insurance coverage during the performance of any corrective Work required by Section 5.

1. **General Liability Insurance**: Commercial General Liability (CGL) on an Occurrence Form, including personal injury, bodily injury and property damage liability on Contractor’s operations, including Subcontractors; on Work Contractor may subcontract or sublet to others; and on the indemnity provisions of this Contract. Coverage shall include, but not be limited to:

   a. **Personal injury**
b. Blanket contractual liability;

c. Completed operations/products liability;

d. Explosion, collapse, and underground, which applicable to the work being performed; and

e. Employer’s liability coverage.

Contractor’s policy shall be designated primary coverage for both defense and indemnity, and any Owner’s policies excess and non-contributory.

2. Automobile Liability Insurance: Automobile liability on an Occurrence Form for owned, non-owned, and hired vehicles.

3. Professional Liability: Required if professional services (e.g., architect, engineering, surveying, legal or medical) are being provided to the Owner and if those professional services are excluded from the General Liability Insurance provided. Coverage may be on a Claims Made basis, if coverage is maintained at least 3-years beyond Final Acceptance.

B. Industrial Insurance compliance: Contractor shall comply with the Washington State Industrial Insurance Act and, if applicable, the Federal Longshoremen’s and Harbor Workers’ Act and the Jones Act.

C. Insurance to protect for the following: All insurance coverages shall protect against claims for damages for personal and bodily injury or death, as well as claims for property damage, which may arise from operations in connection with the Work whether such operations are by Contractor or any Subcontractor.

D. Owner as Additional Insured: All insurance coverages shall be endorsed to include Owner, its officers, and employees, and any required governmental agencies as additional named insureds for Work performed in accordance with the Contract Documents, and all insurance certificates and endorsements shall evidence such additional insureds.

E. Subcontractor Coverage: Contractor shall ensure and require that Subcontractors have insurance coverage to cover bodily injury and property damage on all operations and all vehicles owned or operated by Subcontractors. Subcontractors shall name Contractor and Owner, any required governmental agencies, and others designated in the Contract Documents as well as their officers and employees, as additional insureds and give at least 30 Days’ Notice of cancellation.

2.2 COVERAGE LIMITS

Insurance amounts: The minimum coverage limits shall be as follows for applicable required insurance are specified in the Bonds and Insurance Certificates Section (Section 00 60 00) included with the Bid Documents. To the extent not set forth in the Bonds and Certificates Section or otherwise in the Contract Documents, they are as set forth below:
A. Limits of Liability shall not be less than $2,000,000 Combined Single Limit for Bodily Injury and Property Damage (other than Automobile Liability) Each Occurrence; Personal Injury and Advertising Liability Each Occurrence.

B. $5,000,000 Combined Single Limit Annual General Aggregate.

C. $5,000,000 Annual Aggregate for Products and Completed Operations Liability.

D. $2,000,000 Combined Single Limit for Automobile Bodily Injury and Property Damage Liability, Each Accident or Loss.

E. $1,000,000 for Professional Liability, if applicable.

F. Coverages and Minimums: The Owner does not represent that the minimum required insurance coverage or limits are adequate to protect Contractor from all liabilities.

2.3 INSURANCE COVERAGE CERTIFICATES

A. Certificate required: Prior to commencement of the Work, Contractor shall furnish to Owner a completed certificate of insurance coverage and additional insured endorsements.

B. List Project info: All insurance certificates shall name Owner’s Project number and Project title.

C. Cancellation provisions: All insurance certificates shall specifically require 45 Days prior notice to Owner of cancellation or any material change, except 30 Days for surplus line insurance.

2.4 PAYMENT AND PERFORMANCE BONDS

Conditions for bonds: Payment and performance bonds for 100% of the Contract Award Amount, including Washington state sales tax, shall be furnished for the Work, using the City of Kirkland Contract Bond Form provided. Prior to execution of a Change Order, that cumulatively with previous Change Orders, increases the Contract Award Amount by 15% or more, the Contractor shall provide either new payment and performance bonds for the revised Contract Sum, or riders to the existing payment and performance bonds increasing the amount of the bonds. The Contractor shall likewise provide additional bonds or riders when subsequent Change Orders increase the Contract Sum by 15% or more. No payment or performance bond is required if the Contract Sum is $35,000 or less and Contractor agrees that Owner may, in lieu of the bond, retain 50% of the Contract Sum for the period allowed by RCW 39.08.010.

2.5 ALTERNATIVE SURETY

When alternative surety required: Contractor shall promptly furnish payment and performance bonds from an alternative surety to protect Owner and persons supplying labor or materials required by the Contract Documents if (A) Owner has a reasonable objection to the surety; or (B) Any surety fails to furnish reports on its financial condition if required by Owner.

2.6 BUILDER’S RISK
A. **Contractor to Buy Builder’s Risk Insurance:** When the project involves substantial new building construction, as determined by the Owner, Contractor shall purchase and maintain Builder’s Risk insurance in the amount of the Contract Sum, including all Change Orders, for the Work on a replacement cost basis until Substantial Completion. For projects not involving new building construction, an “Installation Floater” is an acceptable substitute for the Builder’s Risk insurance. The insurance shall cover the interests of Owner, Contractor, and any Subcontractors, as their interests may appear.

B. **Losses Covered:** Builder’s risk insurance shall be placed on an “all risk” basis or equivalent policy form and insure against the perils of fire and extended coverage and physical loss or damage including theft, vandalism, malicious mischief, collapse, false work, flood, wind, temporary buildings, debris removal including demolition, and shall cover reasonable compensation for A/E’s services and expenses required as a result of an insured loss.

C. **Waiver of Subrogation Rights:** Owner and Contractor waive all subrogation rights against each other, any Subcontractors, A/E, A/E’s subconsultants, separate contractors, if any, and any of their subcontractors, for damages caused by fire or other perils to the extent covered by property insurance obtained pursuant to this Section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by Owner as fiduciary. The policies shall provide such waivers of subrogation by endorsement or otherwise. Contractor shall require a similar waiver from its Subcontractors or Subcontractors’ subrogation rights against Contractor, Owner, A/E, A/E’s subconsultants as part of their Subcontract. A waiver of subrogation shall be effective to a Person or entity even though that Person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the Person or entity had an insurable interest in the property damaged.

**PART 3 – TIME AND SCHEDULE**

**3.1 PROGRESS AND COMPLETION**

A. **Contractor to meet schedule:** Contractor shall diligently prosecute the Work, with adequate forces, achieve Substantial Completion within the Contract Time, and achieve Final Completion within the time period specified in the Contract Documents. If Contractor fails to perform in a timely manner in accordance with the Contract Documents and, through the fault of Contractor or Subcontractor(s), fails to meet the Progress Schedule, Contractor shall be in default and shall take such steps as may be necessary to immediately improve its progress without change in the Contract Sum or Contract Time.

B. **Progress Schedule:** Promptly, but in no event later than seven (7) days after issuance of the Notice to Proceed, Contractor shall prepare and submit a preliminary Progress Schedule (the “Progress Schedule”) in the form of a critical path method analysis or as otherwise specified by Owner. The Progress Schedule shall be related to the entire Project and fully consistent with the Contract Documents. The Progress Schedule shall not exceed time limits specified by the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work, and shall show the sequence in which Contractor and the dates on which Contractor plans to start and finish
major portions of the Work, including dates for submission of Submittals, which shall be coordinated with the Progress Schedule and identify dates for Owner review, and for acquiring materials and equipment. The Owner shall not be obligated to accept any Early Completion Schedule suggested by the Contractor. If the Contractor feels that the Work can be completed in less than the specified Contract Time, then the Surplus Time shall be considered Project Float. This Float shall be shown on the Project Schedule. It shall be available to accommodate changes in the work and unforeseen conditions. Neither the Contractor nor the Owner have exclusive right to this Float Time. It belongs to the Project.

C. Monthly Updates: With each Application for payment submitted by Contractor other than the final Application for Payment, Contractor shall submit to the Owner a current Progress Schedule revised to indicate the portion of the Work executed during the time period covered by the Application for Payment, all progress slippages occurring during the previously covered time period, and the corrective actions taken for the slippage carryover into the time period covered by the Application for Payment, the anticipated delays or difficulties, and all other information required to adequately present the actual status of the progress of the Work as of the date of the Application for Payment as may be further required by the Owner.

D. Compliance with Progress Schedule: In the event the Contractor falls behind the Progress Schedule to such an extent that the Owner in good faith determines that the Contractor will be unable to achieve Substantial Completion by the date set forth in the Progress Schedule, as such date may be extended as provided in the Contract Documents, the Contractor shall within two (2) working days following the Owner's demand therefor, provide to the Owner, in writing, a detailed explanation of the measures the Contractor will take in order to recover from the delays so that the progress of the Work complies with the Progress Schedule. If, in the Owner's good faith business judgment, the Contractor's intended recovery measures will not cause the Contractor to recover from the delay (provided such delay arises from a cause which is the Contractor's or its Subcontractor's responsibility) so as to achieve Substantial Completion on schedule, the Owner may direct the Contractor to accelerate the progress of the Work, at the Contractor's sole cost, which acceleration costs shall not cause an adjustment to the Contract Sum.

E. Contractor to notify Owner of delays: Contractor shall perform the Work in accordance with the most recent Progress Schedule submitted to Owner. Contractor shall promptly notify Owner in writing of any actual or anticipated event, interference, or that is delaying or could delay achievement of any milestone, performance of any critical path activity of the Work, or delay in the Substantial Completion date. Contractor shall indicate the expected duration of the delay, the anticipated effect of the delay on the Progress Schedule, and the action being or to be taken to correct the problem. Provision of such Notice does not relieve Contractor of its obligation to complete the Work within the Contract Time.

### 3.2 DELAY

A. **Force Majeure Events:** Acts of Force Majeure include, but are not limited to: acts of God or the public enemy; acts or omissions of any government entity not the fault of Owner or Contractor; fire or other casualty for which Contractor is not responsible; quarantine or
epidemic; industry-wide strike or defensive lockout; unusually severe weather conditions which could not have been reasonably anticipated; and unusual delay in receipt of supplies or products which were ordered and expedited and for which no substitute reasonably acceptable to Owner was available. “Unusually severe weather” shall mean weather conditions that are abnormal for the period of time for which Force Majeure is claimed, that could not reasonably have been anticipated or avoided, and that had an adverse effect on the Progress Schedule.

B. **Contract Time adjustment for Force Majeure:** Contractor shall be entitled to an equitable adjustment in the Contract Time for changes in the time of performance directly attributable to an act of Force Majeure, provided it submits Notice and a Claim in strict compliance with the requirements of Section 8. Contractor shall not be entitled to an adjustment in the Contract Sum resulting from an act of Force Majeure.

C. **Contract Time or Contract Sum adjustment if Owner at fault:** Contractor shall be entitled to an equitable adjustment in Contract Time, and may be entitled to an equitable adjustment in Contract Sum, if the cost or time of Contractor’s performance is changed due to the fault or negligence of Owner, provided the Contractor submits Notice and a Claim in strict compliance with the requirements of Section 8.

D. **No Contract Time or Contract Sum adjustment if Contractor at fault:** Contractor shall not be entitled to an adjustment in Contract Time or in the Contract Sum for any delay or failure of performance to the extent such delay or failure was caused by Contractor or anyone for whose acts Contractor is responsible.

E. **Contract Time adjustment only for concurrent fault:** To the extent any delay or failure of performance was concurrently caused by the Owner and Contractor, Contractor may be entitled to an adjustment in the Contract Time only for that portion of the delay or failure of performance that was concurrently caused, provided it submits Notice and a Claim in strict compliance with the requirements of Section 8, but shall not be entitled to an adjustment in Contract Sum.

F. **Contractor to mitigate delay impacts:** Contractor shall make all reasonable efforts to prevent and mitigate the effects of any delay, whether occasioned by an act of Force Majeure or otherwise. Contractor shall not recover damages, an equitable adjustment or an increase in the Contract Sum or Contract Time from Owner where Contractor could have reasonably avoided the delay by the exercise of due diligence.

G. **Types of damages permitted:** If Contractor and its Subcontractors are entitled to a change in the Contract Sum, the amount of the change shall be the actual costs incurred by the Contractor and Subcontractors directly related to the change calculated in accordance with Section 7 and provided Contractor has complied with Section 8. Failure of Contractor to comply with Section 8 shall result in waiver of Contractor’s Claim. Contractor and its Subcontractors shall not be entitled to damages arising out of actual or alleged loss of efficiency; morale, fatigue, attitude, or labor rhythm; constructive acceleration; home office overhead; expectant underrun; trade stacking; reassignment of workers; rescheduling of Work, concurrent operations; dilution of supervision; learning curve; beneficial or joint occupancy; logistics; ripple; season change; extended overhead; profit upon damages for delay; impact damages including cumulative impacts; or similar damages.
H. **Contractor to notify Owner of labor disputes:** If Contractor has knowledge that any actual or potential labor dispute is delaying or threatens to delay timely performance in accordance with the Contract Documents, Contractor shall immediately give notice, including all relevant information, to Owner.

I. **Pass through notification provisions to Subcontractors:** Contractor agrees to insert a provision in its Subcontracts and to require insertion in all sub-subcontracts, that in the event timely performance of any such contract is delayed or threatened by delay by any actual or potential labor dispute, the Subcontractor or Sub-subcontractor shall immediately notify the next higher tier Subcontractor or Contractor, as the case may be, of all relevant information concerning the dispute.

### 3.3 DAMAGES FOR FAILURE TO ACHIEVE TIMELY COMPLETION

A. **Liquidated Damages:**

   1. **Reason for Liquidated Damages:** Timely performance and completion of the Work is essential to Owner and time limits stated in the Contract Documents are of the essence. Owner will incur serious and substantial damages if Substantial Completion of the Work does not occur within the Contract Time. However, it would be difficult if not impossible to determine the exact amount of such damages. Consequently, provisions for liquidated damages are included in the Contract Documents.

   2. **Calculation of Liquidated Damages amount:** The liquidated damage amounts set forth in the Contract Documents will be assessed not as a penalty, but as liquidated damages for breach of the Contract Documents. This amount is fixed and agreed upon by and between the Contractor and Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain. This amount shall be construed as the actual amount of damages sustained by the Owner, and may be retained by the Owner and deducted from periodic payments to the Contractor.

   3. **Contractor responsible even if Liquidated Damages assessed:** Assessment of liquidated damages shall not release Contractor from any obligations or liabilities pursuant to the Contract Documents. If Contractor substantially fails to perform in a timely manner in accordance with the Contract Documents and, through the fault of Contractor or Subcontractor(s), fails to achieve Substantial Completion within the Contract Time, Contractor shall be in default.

B. **Actual Damages:** If no liquidated damages are set forth in the Contract Documents, actual damages may be assessed for failure to achieve both Substantial Completion and Final Completion within the time provided. Actual damages will be calculated on the basis of direct, architectural, administrative, and any other related costs attributable to the Project from the date when Substantial and/or Final Completion should have been achieved, as applicable. Owner may offset these costs against any payment due Contractor.

**PART 4 – SPECIFICATIONS AND CONTRACT DOCUMENT REVIEW**
4.1 DISCREPANCIES AND CONTRACT DOCUMENT REVIEW

A. Specifications and Drawings are basis of the Work: The intent of the Specifications and Drawings is to describe a complete Project to be constructed in accordance with the Contract Documents. Contractor shall furnish all labor, materials, equipment, tools, transportation, permits, and supplies, and perform the Work required in accordance with the Drawings, Specifications, and other provisions of the Contract Documents.

B. Parts of the Contract Documents are complementary: The Contract Documents are complementary. What is required by one part of the Contract Documents shall be binding as if required by all. Anything mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be of like effect as if shown or mentioned in both.

C. Contractor to report discrepancies in Contract Documents: Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by Owner. If, during the performance of the Work, Contractor finds a conflict, error, inconsistency, or omission in the Contract Documents, it shall promptly and before proceeding with the Work affected thereby, report such conflict, error, inconsistency, or omission to A/E in writing.

D. Contractor knowledge of discrepancy in documents – responsibility: Contractor shall do no Work without applicable Drawings, Specifications, and, where required, accepted shop drawings and other Submittals, unless instructed to do so in writing by Owner. If Contractor performs any construction activity, and it knows or reasonably should have known that any of the Contract Documents contain a conflict, error, inconsistency, or omission, Contractor shall be responsible for the performance and shall bear the cost for its correction.

E. Contractor to perform Work implied by Contract Documents: Contractor shall provide any work or materials the provision of which is clearly implied and is within the scope of the Contract Documents even if the Contract Documents do not mention them specifically.

F. Interpretation questions referred to A/E: Questions regarding interpretation of the requirements of the Contract Documents shall be referred to the A/E.

4.2 SUBMITTALS

A. Definition of Submittals: “Submittals” means documents and other information required to be submitted to A/E by Contractor pursuant to the Contract Documents, showing in detail: the proposed fabrication and assembly of structural elements; and the installation (i.e. form, fit, and attachment details) of materials and equipment. Submittals can include, but are not limited to, shop drawings, product data, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, samples, and similar materials furnished by Contractor to explain in detail specific portions of the Work required by the Contract Documents. For materials and equipment to be incorporated into the Work, Contractor submittal shall include the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the item. When directed, Contractor shall submit all samples at its own expense.
Owner may duplicate, use, and disclose Submittals provided in accordance with the Contract Documents. Submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require Submittals.

B. Approval of Submittals by Contractor and A/E: Contractor shall coordinate all Submittals with the Progress Schedule, shall review them for accuracy, completeness, and compliance with the Contract Documents, and shall indicate its approval thereon as evidence of such coordination and review. Where required by law, Submittals shall be stamped by an appropriate professional licensed by the state of Washington. Submittals submitted to A/E without evidence of Contractor's approval shall be returned for resubmission. Contractor shall review, approve, and submit Submittals with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of Owner or separate contractors. Contractor’s Submittal schedule shall allow a reasonable time for A/E review. A/E will review, approve, or take other appropriate action on the Submittals. Contractor shall perform no portion of the Work requiring submittal and review of Submittals until the respective submittal has been reviewed and the A/E has approved or taken other appropriate action. Owner and A/E shall respond to Submittal with reasonable promptness. Any Work by Contractor shall be in accordance with reviewed Submittals. Submittals made by Contractor which are not required by the Contract Documents may be returned without action.

C. Contractor not relieved of responsibility when Submittals approved: Approval, or other appropriate action with regard to Submittals, by Owner or A/E shall not relieve Contractor of responsibility for any errors or omissions in such Submittals, nor from responsibility for compliance with the requirements of the Contract Documents. Unless specified in the Contract Documents, review by Owner or A/E shall not constitute an approval of the safety precautions employed by Contractor during construction, or constitute an approval of Contractor’s means or methods of construction. If Contractor fails to obtain approval before installation and the item or work is subsequently rejected, Contractor shall be responsible for all costs of correction.

D. Variations between Submittals and Contract Documents: If Submittals vary from the requirements of the Contract Documents, Contractor shall in detail describe such variations in writing, separate from the Submittals, at the time it submits the Submittals containing such variations. If Owner approves any such variation, an appropriate Change Order will be issued. If the variation is minor and does not involve an adjustment in the Contract Sum or Contract Time, a Change Order need not be issued; however, the modification shall be approved by Owner in writing. Approval for substitutions shall not be sought and shall not be approved through the submission of Submittals.

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

A. The City/Owner not Contractor, owns Copyright of Drawings and Specifications: The Drawings, Specifications, and other documents prepared by A/E are instruments of A/E’s contracted service to the City through which the Work to be executed by Contractor is described. Neither Contractor nor any Subcontractor shall own or claim a copyright in the Drawings, Specifications, and other documents prepared by A/E, and A/E shall be deemed the author of them and will, along with any rights of Owner, retain all common
law, statutory, and other reserved rights, in addition to the copyright. All copies of these documents, except Contractor’s set, shall be returned or suitably accounted for to A/E, on request, upon completion of the Work.

B. **Drawings and Specifications to be used only for this Project:** The Drawings, Specifications, and other documents prepared by the A/E, and copies thereof furnished to Contractor, are for use solely with respect to this Project. They are not to be used by Contractor or any Subcontractor on other projects or for additions to this Project outside the scope of the Work without the specific written consent of Owner and A/E. Contractor and Subcontractors are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by A/E appropriate to and for use in the execution of their Work.

C. **License granted to Owner:** Contractor and all Subcontractors grant a non-exclusive license to Owner, without additional cost or royalty, to use for its own purposes (including reproduction) all Submittals, together with the information and diagrams contained therein, prepared by Contractor or any Subcontractor. In providing Submittals, Contractor and all Subcontractors warrant that they have authority to grant to Owner a license to use the Submittals, and that such license is not in violation of any copyright or other intellectual property right. Contractor agrees to defend and indemnify Owner pursuant to the indemnity provisions in Section 5 from any violations of copyright or other intellectual property rights arising out of Owner’s use of the Submittals hereunder, or to secure for Owner, at Contractor’s own cost, licenses in conformity with this Section.

**PART 5 – PERFORMANCE**

**5.1 CONTRACTOR CONTROL AND SUPERVISION**

A. **Contractor responsible for Means and Methods of construction:** Contractor shall supervise and direct the Work, using its best skill and attention, and shall perform the Work in a skillful manner. Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work, unless the Contract Documents give other specific instructions concerning these matters. Contractor shall disclose its means and methods of construction when requested by Owner. The Contractor shall be responsible to the Owner for acts and omissions of Contractor, Contractor’s employees, Subcontractors, and their agents and employees, and other person or entities performing portions of the Work for or on behalf of the Contractor or any of its Subcontractors.

B. **Competent superintendent required:** Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Contractor, as soon as practicable after award of the Contract, shall furnish in writing to Owner the name and qualifications of its proposed superintendent. Within 14 days of receipt of the information, Owner may reply to Contractor in writing stating (1) whether Owner has reasonable objection to the proposed superintendent or (2) that Owner requires additional time to review. The superintendent must be satisfactory to Owner and shall not be changed without the prior written consent of Owner. Owner may require Contractor to remove the superintendent from the Work or Project site, if Owner
reasonably deems the superintendent incompetent, careless, or otherwise objectionable, provided Owner has first notified Contractor in writing and allowed a reasonable period for transition.

C. **Contractor to employ competent and disciplined workforce:** Contractor shall enforce strict discipline and good order among all of the Contractor’s employees and other persons performing the Work. Contractor shall not permit employment of persons not skilled in tasks assigned to them. Contractor’s employees shall at all times conduct business in a manner which assures fair, equal, and nondiscriminatory treatment of all persons. Owner may, by written notice, request Contractor to remove from the Work or Project site any employee Owner reasonably deems incompetent, careless, or otherwise objectionable.

D. **Contractor to keep Project documents on site:** Contractor shall keep on the Project site a copy of the Drawings, Specifications, addenda, reviewed Submittals, and permits and permit drawings.

E. **Contractor to comply with ethical standards:** Contractor shall ensure that its owner(s) and employees, and those of its Subcontractors, comply with the Ethics in Public Service Act RCW 42.52, which, among other things, prohibits state employees from having an economic interest in any public works contract that was made by, or supervised by, that employee. Contractor shall remove, at its sole cost and expense, any of its, or its Subcontractors’ employees, if they are in violation of this act.

F. **Daily Reports:** Contractor shall provide a Daily Report to the Owner for each work day during the Contract Time. The Daily Report shall be completed on a form subject to the approval of the Owner and Architect. The Daily Report shall include any disputed, delayed, or disrupted Work as well as any changed or additional Work requested or identified. The Daily Report shall not serve as a substitute for, or relieve Contractor of its obligations to provide formal written notice to Contractor as required by the Contract Documents, including but not limited to Section 7 and Section 8.

### 5.2 PERMITS, TAXES, PATENTS AND ROYALTIES

A. **Permits:** Owner will obtain and pay for the Land Use Permit, General Building Permit, Civil Construction Permit, and Signage permit. All other permits and fees required to execute the work shall be obtained and paid for by the Contractor. Prior to Final Acceptance, the approved, signed permits shall be delivered to the Owner.

B. **Contractor to comply with all applicable laws:** Contractor shall comply with and give notices required by all federal, state, and local laws, ordinances, rules, regulations, and lawful orders of public authorities applicable to performance of the Work. No person shall, on the grounds of age, race, creed, color, sec, sexual oriental, religion, national origin, marital status, honorably discharged veteran or military status, or disability (physical, mental, or sensory) be denied the benefits of, or otherwise be subjected to discrimination under any project, program, or activity funded in whole or in part under this Agreement.

C. **Taxes:** Contractor shall pay sales, consumer, use, business and occupation, income and similar taxes for the Work that are legally enacted when the initial Contract Sum is agreed.
D. **Patents and Royalties**: Contractor is responsible for, and shall pay, all royalties and license fees. Contractor shall defend, indemnify, and hold Owner harmless from any costs, expenses, and liabilities arising out of the infringement by Contractor of any patent, copyright, or other intellectual property right used in the Work; however, provided that Contractor gives prompt notice, Contractor shall not be responsible for such defense or indemnity when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents. If Contractor has reason to believe that use of the required design, process, or product constitutes an infringement of a patent or copyright, it shall promptly notify Owner of such potential infringement.

5.3 **PREVAILING WAGES**

A. **Contractor to pay Prevailing Wages**: Contractor shall pay the prevailing rate of wages to all workers, laborers, or mechanics employed in the performance of any part of the Work in accordance with RCW 39.12 and the rules and regulations of the Department of Labor and Industries. The schedule of prevailing wage rates for the locality or localities of the Work, is determined by the Industrial Statistician of the Department of Labor and Industries. It is the Contractor’s responsibility to verify the applicable prevailing wage rate.

B. **Statement of Intent to Pay Prevailing Wages**: Before payment is made by the Owner to the Contractor for any work performed by the Contractor and subcontractors whose work is included in the application for payment, the Contractor shall submit, or shall have previously submitted to the Owner for the Project, a Statement of Intent to Pay Prevailing Wages, approved by the Department of Labor and Industries, certifying the rate of hourly wage paid and to be paid each classification of laborers, workers, or mechanics employed upon the Work by Contractor and Subcontractors. Such rates of hourly wage shall not be less than the prevailing wage rate.

C. **Affidavit of Wages Paid**: Prior to release of retainage, the Contractor shall submit to the Owner an Affidavit of Wages Paid, certified by the Department of Labor and Industries, for the Contractor and each and every Subcontractor that performed work on the Project. Contractor’s compliance with this paragraph and RCW 60.28 is a condition precedent to the release of retainage to Contractor.

D. **Disputes**: Disputes regarding prevailing wage rates shall be referred for arbitration to the Director of the Department of Labor and Industries. The arbitration decision shall be final and conclusive and binding on all parties involved in the dispute as provided for by RCW 39.12.060.

E. **Statement with pay application; Post Statements of Intent at job site**: Each Application for Payment submitted by Contractor shall state that prevailing wages have been paid in accordance with the prefilled statement(s) of intent, as approved. Copies of the approved intent statement(s) shall be posted on the job site with the address and telephone number of the Industrial Statistician of the Department of Labor and Industries where a complaint or inquiry concerning prevailing wages may be made.

F. **Contractor to pay for Statements of Intent and Affidavits**: In compliance with chapter 296-127 WAC, Contractor shall pay to the Department of Labor and Industries the currently
established fee(s) for each statement of intent and/or affidavit of wages paid submitted to the Department of Labor and Industries for certification.

G. **Certified Payrolls:** Consistent with WAC 296-127-320, the Contractor and any subcontractor shall submit a certified copy of payroll records if requested.

### 5.4 SAFETY AND CLEAN-UP

A. **Contractor responsible for safety:** Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Work. Contractor shall be solely and completely responsible for conditions of the Project site, including safety of all persons and property, during performance of the Work. Contractor shall maintain the Project site and perform the Work in a manner that meets statutory and common-law requirements for the provision of a safe place to work. This requirement shall apply continuously and not be limited to working hours. Any review by Owner or A/E of Contractor’s performance shall not be construed to include a review of the adequacy of Contractor’s safety measures in, on or near the site of the Work.

B. **Contractor safety responsibilities:** In carrying out its responsibilities according to the Contract Documents, Contractor shall protect the lives and health of employees performing the Work and other persons who may be affected by the Work; prevent damage to materials, supplies, and equipment whether on site or stored off-site; and prevent damage to other property at the site or adjacent thereto. Contractor shall comply with all applicable laws, ordinances, rules, regulations, and orders of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury, or loss; shall erect and maintain all necessary safeguards for such safety and protection; and shall notify owners of adjacent property and utilities when prosecution of the Work may affect them.

C. **Contractor to maintain safety records:** Contractor shall maintain an accurate record of exposure data on all incidents relating to the Work resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. Contractor shall immediately report any such incident to Owner. Owner shall, at all times, have a right of access to all records of exposure.

D. **Contractor to provide HazMat training:** Contractor shall provide all persons working on the Project site with information and training on hazardous chemicals in their work at the time of their initial assignment, and whenever a new hazard is introduced into their work area. At a minimum, Contractor shall inform persons working on the Project site of the requirements of chapter 296-62 WAC, General Occupational Health Standards, any operations in their work area where hazardous chemicals are present; and the location and availability of written hazard communication programs, including the required list(s) of hazardous chemicals and material safety data sheets required by chapter 296-62 WAC. Contractor shall also provide training for persons working on the Project site which includes Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area, the physical and health hazards of the chemicals in the work area; the measures such persons can take to protect themselves from these hazards, the details of the hazard communications program developed by Contractor, or its Subcontractors, including an explanation of the labeling system and the
material safety data sheet, and how employees can obtain and use the appropriate hazard information.

E. **Hazardous, toxic or harmful substances and Notice:** Contractor shall not keep, use, dispose, transport, generate, or sell on or about the Project site, any substances now or hereafter designated as, or which are subject to regulation as, hazardous, toxic, dangerous, or harmful by any federal, state or local law, regulation, statute or ordinance (hereinafter collectively referred to as “hazardous substances”), in violation of any such law, regulation, statute, or ordinance, but in no case shall any such hazardous substance be stored more than 90 Days on the Project site. Contractor shall promptly notify Owner of all spills or releases of any hazardous substances which are otherwise required to be reported to any regulatory agency and pay the cost of cleanup. Contractor shall promptly notify Owner of all failures to comply with any federal, state, or local law, regulation, or ordinance; all inspections of the Project site by any regulatory entity concerning the same; all regulatory orders or fines; and all responses or interim cleanup actions taken by or proposed to be taken by any government entity or private party on the Project site.

F. **Public safety and traffic:** All Work shall be performed with due regard for the safety of the public. Contractor shall perform the Work so as to cause a minimum of interruption of vehicular traffic or inconvenience to pedestrians. All arrangements to care for such traffic shall be Contractor’s responsibilities. All expenses involved in the maintenance of traffic by way of detours shall be borne by Contractor.

G. **Contractor to act in an emergency:** In an emergency affecting the safety of life or the Work or of adjoining property, Contractor is permitted to act, at its discretion, to prevent such threatened loss or injury, and Contractor shall so act if so authorized or instructed.

H. **No duty of safety by Owner or A/E:** Nothing provided in this Section shall relieve Contractor of sole and complete responsibility for safety at the Project site, for sole and complete responsibility for any violation of safety or property protection requirements or the correction thereof, or impose any duty upon Owner or A/E with regard to, or as constituting any express or implied assumption of control or responsibility over, any other safety conditions relating to employees or agents of Contractor or any of its Subcontractors, or the public. Any Notice Owner or A/E gives to Contractor of a safety or property protection violation will not: (1) relieve Contractor of sole and complete responsibility for the violation and the correction thereof, or for sole liability for the consequences of said violation; (2) impose any obligation upon Owner or A/E to inspect or review Contractor’s safety program or precautions or to enforce Contractor’s compliance with the requirements of this Section; or (3) impose any continuing obligation upon Owner or A/E to provide such Notice to Contractor or any other persons or entity.

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

A. Limited storage areas: Contractor shall confine all operations, including storage of materials, to Owner-approved areas.

B. Temporary buildings and utilities at Contractor expense: Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be provided by Contractor only with the consent of Owner and without expense to Owner. The temporary buildings and utilities shall be removed by Contractor at its expense upon completion of the Work.

C. Roads and vehicle loads: Contractor shall use only established roadways or temporary roadways authorized by Owner. When materials are transported in prosecuting the Work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by federal, state, or local law or regulation.

D. Ownership and reporting by Contractor of demolished materials: Ownership and control of all materials or facility components to be demolished or removed from the Project site by Contractor shall immediately vest in Contractor upon severance of the component from the facility or severance of the material from the Project site. Contractor shall be responsible for compliance with all laws governing the storage and ultimate disposal. Contractor shall provide Owner with a copy of all manifests and receipts evidencing proper disposal when required by Owner or applicable law.

E. Contractor responsible for care of materials and equipment on-site: Contractor shall be responsible for the proper care and protection of its materials and equipment delivered to the Project site. Materials and equipment may be stored on the premises subject to approval of Owner. When Contractor uses any portion of the Project site as a shop, Contractor shall be responsible for any repairs, patching, or cleaning arising from such use.

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

5.6 UNFORESEEN PHYSICAL CONDITIONS

A. Notice requirement for concealed or unknown conditions: If Contractor encounters conditions at the site which are subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents, or unknown physical conditions of an unusual nature which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then Contractor shall give written notice to Owner promptly and in no event later than 7 Days after the first observance of the conditions. Conditions shall not be disturbed prior to such notice.
B. Adjustment in Contract Time and Contract Sum: If such conditions differ materially and cause a change in Contractor’s cost of, or time required for, performance of any part of the Work, the Contractor may be entitled to an equitable adjustment in the Contract Time or Contract Sum, or both, provided it makes a request therefore as provided in Section 7 and Section 8. Failure to provide notice as required by this Section, Section 7 and Section 8 shall result in waiver of Contractor’s right to any adjustment in the Contract Time and Contract Sum.

5.7 MATERIAL, EQUIPMENT, TESTS, AND INSPECTION

A. Contractor to provide new and equivalent equipment and materials: All equipment, material, and articles incorporated into the Work shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in the Contract Documents. References in the Specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard quality and shall not be construed as limiting competition. Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of A/E and after submittal and approval of a substitute request, is equal to that named in the Specifications, unless otherwise specifically provided in the Contract Documents.

B. Contractor responsible for fitting parts together: Contractor shall do all cutting, fitting, or patching that may be required to complete the Work or to make its several parts fit together properly, or receive or be received by work of others set forth in, or reasonably implied by, the Contract Documents. Contractor shall not damage or endanger any work of Owner or separate contractors by cutting, excavating, or otherwise altering the Work and shall not cut or alter the work of any other contractor unless approved in advance by Owner. Contractor shall restore all areas requiring cutting, fitting and patching to the condition existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

C. Owner may reject defective Work: Should any of the Work be found defective, or in any way not in accordance with the Contract Documents, this Work, in whatever stage of completion, may be rejected by Owner. However, neither this authority of Owner nor a decision made either to exercise or not to exercise such authority shall give rise to a duty or responsibility of Owner or its representatives to Contractor, Subcontractors, their agents or employees, or other persons or entities performing portions of the Work.

D. Contractor to provide for all testing and inspection of Work: Contractor shall maintain an adequate testing and inspection program and perform such tests and inspections as are necessary or required to ensure that the Work conforms to the requirements of the Contract Documents. Contractor shall be responsible for inspection and quality surveillance of all its Work and all Work performed by any Subcontractor. Unless otherwise provided, Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. Contractor shall give Owner timely notice of when and where tests and inspections are to be made. Contractor shall maintain complete inspection records and make them available to Owner.
E. **Owner may conduct tests and inspections:** Owner may, at any reasonable time, conduct such inspections and tests as it deems necessary to ensure that the Work is in accordance with the Contract Documents. Owner shall promptly notify Contractor if an inspection or test reveals that the Work is not in accordance with the Contract Documents. Unless the subject items are expressly accepted by Owner, such Owner inspection and tests are for the sole benefit of Owner and do not: constitute or imply acceptance; relieve Contractor of responsibility for providing adequate quality control measures; relieve Contractor of responsibility for risk of loss or damage to the Work, materials, or equipment; relieve Contractor of its responsibility to comply with the requirements of the Contract Documents; or impair Owner’s right to reject defective or nonconforming items, or to avail itself of any other remedy to which it may be entitled.

F. **Inspections or inspectors do not modify Contract Documents:** Neither observations by an inspector retained by Owner, the presence or absence of such inspector on the site, nor inspections, tests, or approvals by others, shall relieve Contractor from any requirement of the Contract Documents, nor is any such inspector authorized to change any term or condition of the Contract Documents.

G. **Contractor responsibilities on inspections:** Contractor shall promptly furnish, without additional charge, all facilities, labor, material and equipment reasonably needed for performing such safe and convenient inspections and tests as may be required by Owner. Owner may charge Contractor any additional cost of inspection or testing when Work is not ready at the time specified by Contractor for inspection or testing, or when prior rejection makes reinspection or retest necessary. Owner shall perform its inspections and tests in a manner that will cause no undue delay in the Work.

### 5.8 CORRECTION OF NONCONFORMING WORK

A. **Work covered by Contractor without inspection:** If a portion of the Work is covered contrary to the request of Owner or the requirements in the Contract Documents or a governmental authority having jurisdiction, it must, if required in writing by Owner, be uncovered for Owner’s observation and be replaced at Contractor’s expense and without change in the Contract Sum or Contract Time.

B. **Payment provisions for uncovering covered Work:** If, at any time prior to Final Completion, Owner desires to examine the Work, or any portion of it, which has been covered, Owner may request to see such Work and it shall be uncovered by Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an adjustment in the Contract Sum for the costs of uncovering and replacement, and, if completion of the Work is thereby delayed, an adjustment in the Contract Time, provided it makes such a request as provided in Section 7. If such Work is not in accordance with the Contract Documents, the Contractor shall pay the costs of examination and reconstruction.

C. **Contractor to correct and pay for non-conforming Work:** Contractor shall promptly correct Work found by Owner not to conform to the requirements of the Contract Documents, whether observed before or after Substantial Completion and whether or not fabricated, installed, or completed. Contractor shall bear all costs of correcting such nonconforming Work, including additional testing and inspections.
D. Contractor’s compliance with correction and warranty provisions: If, within one year after the date of Substantial Completion of the Work or designated portion thereof, or within one year after the date for commencement of any system warranties established, or within the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, Contractor shall correct it promptly after receipt of written Notice from Owner to do so. Owner shall give such Notice promptly after discovery of the condition. This period of one year shall be extended, with respect to portions of Work first performed after Substantial Completion, by the period of time between Substantial Completion and the actual performance of the Work. Contractor’s duty to correct with respect to Work repaired or replaced shall run for one year from the date of repair or replacement. Obligations under this Section shall survive Final Acceptance and are in addition to other warranties provided by contract or law.

E. Contractor to remove non-conforming Work: Contractor shall remove from the Project site portions of the Work which are not in accordance with the requirements of the Contract Documents and are neither corrected by Contractor nor accepted by Owner.

F. Owner may charge Contractor for non-conforming Work: If Contractor fails to correct nonconforming Work within a reasonable time after written notice to do so, Owner may replace, correct, or remove the nonconforming Work and charge the cost thereof to the Contractor.

G. Contractor to pay for damaged Work during correction: Contractor shall bear the cost of correcting destroyed or damaged Work, whether completed or partially completed, caused by Contractor’s correction or removal of Work which is not in accordance with the requirements of the Contract Documents.

H. No Period of limitation on other requirements: Nothing contained in this Section shall be construed to establish a period of limitation with respect to other obligations which Contractor might have according to the Contract Documents. Establishment of the time period of one year as described in this Section relates only to the specific obligation of Contractor to correct the Work, and has no relationship to the time within which the Contractor’s obligation to comply with the Contract Documents may be sought to be enforced, including the time within which such proceedings may be commenced and damages for failure to comply with the Contract Documents may be sought.

I. Owner may accept non-conforming Work and charge Contractor: If Owner prefers to accept Work which is not in accordance with the requirements of the Contract Documents, Owner may do so instead of requiring its removal and correction, in which case the Contract Sum may be reduced as appropriate and equitable.

5.9 SUBCONTRACTORS AND SUPPLIERS

A. Subcontractor Responsibility: The Contractor shall include the language of this paragraph in each of its first tier subcontracts, and shall require each of its subcontractors to include the same language of this Section in each of their subcontracts, adjusting only as necessary the terms used for the contracting parties. Upon request of the Owner, the Contractor shall promptly provide documentation to the Owner demonstrating that the subcontractor meets the subcontractor responsibility criteria below. The requirements of
this paragraph apply to all subcontractors regardless of tier. At the time of subcontract execution, the Contractor shall verify that each of its first tier subcontractors meets the following bidder responsibility criteria:

1. Have a current certificate of registration as a contractor in compliance with chapter 18.27 RCW, which must have been in effect at the time of subcontract bid submittal;

2. Have a current Washington Unified Business Identifier (UBI) number;

3. If applicable, have: Industrial Insurance (workers’ compensation) coverage for the subcontractor’s employees working in Washington, as required in Title 51 RCW; a Washington Employment Security Department number, as required in Title 50 RCW; a Washington Department of Revenue state excise tax registration number, as required in Title 82 RCW; An electrical contractor license, if required by Chapter 19.28 RCW; an elevator contractor license, if required by Chapter 70.87 RCW, not be disqualified from bidding on any public works contract under RCW 39.06.010 or 39.12.065(3), on a project subject to the apprenticeship utilization requirements in RCW 39.04.320, not have been found out of compliance by the Washington state apprenticeship and training council for working apprentices out of ratio, without appropriate supervision, or outside their approved work processes as outlined in their standards of apprenticeship under chapter 49.04 RCW for the one-year period immediately preceding the date of the Owner’s first advertisement of the project, and meet all supplemental responsibility criteria set forth in the Contract Documents.

B. **Provide names of Subcontractors and use qualified firms:** Before submitting the first Application for Payment, Contractor shall furnish in writing to Owner the names, addresses, and telephone numbers of all Subcontractors, as well as suppliers providing materials in excess of $2,500. Contractor shall utilize Subcontractors and suppliers which are experienced and qualified, and meet the requirements of the Contract Documents, if any. Contractor shall not utilize any Subcontractor or supplier to whom Owner has a reasonable objection, and shall obtain Owner’s written consent before making any substitutions or additions.

C. **Coordination of Subcontractors; Contractor responsible for Work:** Contractor shall schedule, supervise, and coordinate the operations of all Subcontractors. No Subcontracting of any of the Work shall relieve Contractor from its responsibility for the performance of the Work in accordance with the Contract Documents or any other obligations of the Contract Documents.

D. **Automatic assignment of subcontracts:** Each subcontract agreement for a portion of the Work is hereby assigned by Contractor to Owner provided that (1) the assignment is effective only after termination by Owner for cause pursuant to Section 9 and only for those Subcontracts which Owner accepts by notifying the Subcontractor in writing; (2) after the assignment is effective, Owner will assume all future duties and obligations toward the Subcontractor which Contractor assumed in the Subcontract; and (3) the assignment is subject to the prior rights of the surety, if any, obligated under any bond provided in accordance with the Contract Documents.
E. Owner may award other contracts; Contractor to cooperate: Owner may undertake or award other contracts for additional work at or near the Project site. Owner shall help coordinate the activities of Owner’s own forces and of each separate contractor engaged by Owner with the Work of Contractor, who shall reasonably cooperate and coordinate with the other contractors and with Owner’s employees and shall carefully adapt scheduling and perform the Work in accordance with these Contract Documents to reasonably accommodate the other work.

5.10 WARRANTY

A. Contractor warranty of Work: In addition to any special warranties provided elsewhere in the Contract Documents, Contractor warrants that all Work conforms to the requirements of the Contract Documents and is free of any defect in equipment, material, or design furnished, or workmanship performed by Contractor.

B. Contractor responsibilities: With respect to all warranties, express or implied, for Work performed or materials furnished according to the Contract Documents, Contractor shall:

1. Obtain warranties: Obtain, assign if requested, and furnish directly to Owner, all warranties that would be given in normal commercial practice or that are required by the Contract Documents, first executed by the applicable Subcontractor and those suppliers and manufacturers furnishing materials for the Work, and subsequently countersigned by Contractor, which shall extend to Owner all rights, claims, benefits and interests that Contractor may have under express or implied warranties or guarantees against the Subcontractor, supplier or manufacturer for defective or non-conforming Work;

2. Warranties for benefit of Owner: Require all warranties to be executed, in writing, for the benefit of Owner;

3. Enforcement of warranties: Enforce all warranties for the benefit of Owner, if directed by Owner; and

4. Contractor responsibility for Subcontractor warranties: Be responsible to enforce any Subcontractor’s, manufacturer’s, or supplier’s warranties should they extend beyond the period specified in the Contract Documents.

C. Warranties beyond Final Acceptance: The obligations under this Section shall survive Final Acceptance.

5.11 INDEMNIFICATION

A. Contractor to indemnify Owner: To the fullest extent permitted by law, Contractor shall defend, indemnify, and hold Owner and A/E, their consultants, and agents and employees, directors, elected officials, officers, lenders, successors and assigns of any of them (collectively, the "Indemnified Parties"), harmless from and against all claims, demands, losses, damages, or costs, including but not limited to damages arising out of bodily injury or death to persons and damage to property, direct and indirect, or consequential (including but not limited to costs and attorneys’ fees incurred on such claims or in proving the right to indemnification), arising out of, caused by or resulting
from performance of the Work. Contractor’s indemnity and defense obligations do not extend to liability resulting from: the sole negligence or willful misconduct of the Indemnified Parties. Contractor’s duty to indemnify and defend Owner for liability for damages arising out of bodily injury to persons or damage to property caused by or resulting from the concurrent negligence of (a) the Indemnified Parties; and (b) Contractor or its agents, employees, and Subcontractors and suppliers of any tier, shall apply only to the extent of the negligence of Contractor, its agents, employees, and Subcontractors and suppliers of any tier. This indemnification obligation shall include, but is not limited to, all Claims against the Owner by an employee or former employee of the Contractor or any Subcontractor.

B. Obligations: The obligations of Contractor under this Section shall survive completion, acceptance, final payment and termination of the Contract and shall not be construed to negate, abridge, or otherwise reduce any other right or obligations of indemnity that would otherwise exist as to any party or person described in this Section. To the extent the wording of this Section would reduce or eliminate the insurance coverage of Owner or Contractor, this Section shall be considered modified to the extent that such insurance coverage is not affected. To the extent that any portion of this Section is stricken by a court or arbitrator for any reason, all remaining provisions shall retain their vitality and effect.

C. RCW Title 51: Employee action and RCW Title 51: In any action against Owner and any other entity indemnified in accordance with this section, by any employee of Contractor, its Subcontractors, Sub-subcontractors, agents, or anyone directly or indirectly employed by any of them, the indemnification obligation of this section shall not be limited by a limit on the amount or type of damages, compensation, or benefits payable by or for Contractor or any Subcontractor under RCW Title 51, the Industrial Insurance Act, or any other employee benefit acts. In addition, Contractor waives immunity as to Owner and A/E only, in accordance with RCW Title 51.

D. Defense Costs. Defense cost recovery shall include all fees (of attorneys and experts), in costs and expenses incurred in good faith. In addition, Owner shall be entitled to recover compensation for all of its expenses (including materials and labor) consumed in its defense.

PART 6 – PAYMENTS AND COMPLETION

6.1 CONTRACT SUM AND APPLICATION FOR PAYMENTS

A. Owner shall pay Contract Sum: Owner shall pay Contractor the Contract Sum for performance of the Work, in accordance with the Contract Documents.

B. Contractor to submit Schedule of Values: At least 7 Days prior to submitting its first Application for Payment, Contractor shall submit to Owner for approval a breakdown allocating the total Contract Sum to each principal category of work, in such detail as requested by Owner (“Schedule of Values”), but including a minimum of 30 line items. The approved Schedule of Values shall allocate appropriate amounts, not less than 5% of the total bid, to that portion of the Work between Substantial Completion and Final Completion to recognize not-yet-earned costs for demobilization, O&M manuals, and any other requirements for Project closeout and in advancing the Work from Substantial
Completion to Final Completion. The approved Schedule of Values shall be used by Owner as a basis for reviewing progress payments. Payment for Work shall be made only for and in accordance with those items included in the Schedule of Values.

C. Monthly Application for Payment with substantiation: At monthly intervals, unless determined otherwise by Owner, Contractor shall submit to Owner an itemized Application for Payment for Work completed in accordance with the Contract Documents and the approved Schedule of Values. Each application shall be supported by such substantiating data as Owner may require.

D. Contractor certifies Subcontractors paid: By submitting an Application for Payment, Contractor is certifying that all Subcontractors have been paid, less earned retainage in accordance with RCW 60.28.011, as their interests appeared in the last preceding Application for Payment. By submitting an Application for Payment, Contractor is recertifying that the representations set forth in Section 1.3 are true and correct, to the best of Contractor’s knowledge, as of the date of the Application for Payment. Owner has the right to request written evidence from Contractor that Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by Owner to Contractor for subcontracted Work. Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Owner shall not have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

E. Reconciliation of Work with Progress Schedule: At the time it submits an Application for Payment, Contractor shall analyze and reconcile, to the satisfaction of Owner, the actual progress of the Work with the Progress Schedule. The submission of an Application for Payment constitutes a certification that the Work is current on the Progress Schedule.

F. Payment for material delivered to site or stored off-site: If authorized by Owner, the Application for Payment may include request for payment for material delivered to the Project site and suitably stored, or for completed preparatory work. Payment may similarly be requested for material stored off the Project site, provided Contractor complies with or furnishes satisfactory evidence of the following:

1. Suitable facility or location within 10 miles of the Project: The material will be placed in a facility or location that is within a 10-mile radius of the Project, structurally sound, secure (continuously under lock and key), dry, lighted and suitable for the materials to be stored or otherwise approved by Owner;

2. Insurance provided on materials in facility or location: Contractor furnishes Owner a certificate of insurance extending Contractor’s insurance coverage for damage, fire, and theft to cover the full value of all materials stored, or in transit;

3. Owner right of access to facility or location: Owner shall at all times have the right of access to the Project site;

4. Contractor assumes total responsibility for stored materials: Contractor and its surety assume total responsibility for the stored materials; and
5. Contractor provides documentation and Notice when materials moved to site:
   Contractor furnishes to Owner certified lists of materials stored, bills of lading, invoices, and other information as may be required, and shall also furnish Notice to Owner when materials are moved from storage to the Project site.

6.2 PROGRESS PAYMENTS

A. Owner to pay within 30 Days: Owner shall make progress payments, in such amounts as Owner determines are properly due, within 30 Days after receipt of a properly executed Application for Payment. Owner shall notify Contractor in accordance with chapter 39.76 RCW if the Application for Payment does not comply with the requirements of the Contract Documents.

B. Withholding retainage; Options for retainage: Owner shall retain 5% of the amount of each progress payment until 45 Days after Final Acceptance and receipt of all documents required by law or the Contract Documents, including, at Owner’s request, consent of surety to release of the retainage. In accordance with chapter 60.28 RCW, Contractor may request that monies reserved be retained in a fund by Owner, deposited by Owner in a bank or savings and loan, or placed in escrow with a bank or trust company to be converted into bonds and securities to be held in escrow with interest to be paid to Contractor. Owner may permit Contractor to provide an appropriate bond in lieu of the retained funds.

C. Title passes to Owner upon payment: Title to all Work and materials covered by a progress payment shall pass to Owner at the time of such payment free and clear of all liens, claims, security interests, and encumbrances. Passage of title shall not, however, relieve Contractor from any of its duties and responsibilities for the Work or materials, or waive any rights of Owner to insist on full compliance by Contractor with the Contract Documents. A progress payment, or partial or entire use or occupancy of the Project by Owner, shall not constitute acceptance of Work.

6.3 PAYMENTS WITHHELD

A. Owner’s right to withhold payment: Owner may withhold or, on account of subsequently discovered evidence, nullify the whole or part of any payment to such extent as may be necessary to protect Owner from loss or damage for reasons including but not limited to: (1) Work not in accordance with the Contract Documents; (2) Reasonable evidence that the Work required by the Contract Documents cannot be completed for the unpaid balance of the Contract Sum; (3) Work by Owner to correct defective Work or complete the Work in accordance with Section 5; (4) Claims (except where an insurer has unconditionally accepted coverage) filed or reasonable evidence indicating probable filing of such claims unless Contractor provides security acceptable to Owner; (5) The failure of Contractor to make payments to Subcontractors for labor, materials or equipment; (6) Damage to Owner or a separate contractor (except where an insurer has unconditionally accepted coverage); (7) Failure to submit affidavits pertaining to wages paid or certified payrolls as requested or otherwise required by statute; (8) Contractor’s failure otherwise to perform in accordance with the Contract Documents; or (9) Contractor’s negligent acts or omissions: Cost or liability that may occur to Owner as the result of Contractor’s fault or negligent acts or omissions.
B. Owner to notify Contractor of withholding for unsatisfactory performance: In any case where part or all of a payment is going to be withheld for unsatisfactory performance, Owner shall notify Contractor in accordance with chapter 39.76 RCW.

6.4 RETAINAGE, BOND CLAIM RIGHTS, AND LIENS

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

B. Liens: Contractor shall promptly pay (and secure the discharge of any liens asserted by) all persons properly furnishing labor, equipment, materials or other items in connection with the performance of the Work (including, but not limited to, any Subcontractors) to the extent that Owner has paid Contractor for this Work. Owner may, at its option, withhold payment, in whole or in part, to Contractor until lien and claim releases are furnished. Contractor may provide other security acceptable to Owner, such as a bond, in lieu of paying disputed liens or claims. Contractor shall defend, indemnify, and hold harmless Owner from any liens, including all expenses and attorneys’ fees, except to the extent a lien has been recorded because of a failure of payment by Owner for the Work implicated in any such lien.

6.5 SUBSTANTIAL COMPLETION

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

B. Owner to determine if Work is complete: Upon receipt of Contractor’s list, Owner will make an inspection to determine whether the Work or designated portion thereof has achieved Substantial Completion. If Owner’s inspection discloses any item, whether or not included on Contractor’s list, that is not sufficiently complete in accordance with the Contract Documents so that Owner can occupy or utilize the Work or designated portion thereof for its intended use, Contractor shall, before the occurrence of Substantial Completion, complete or correct the item upon notification by Owner, and Contractor shall then submit a request for another inspection by Owner to determine Substantial Completion. If Owner determines that the Work or designated portion has not achieved Substantial Completion, Contractor shall expeditiously complete the Work or designated portion, again request an inspection, and pay the costs associated with the re-inspection.
C. Contractor to complete punch list in timely manner: Contractor shall prepare, continue to monitor, and cause to be completed, all punch lists with respect to the activity of each Subcontractor and report weekly to Owner on outstanding punch list items.

6.6 PRIOR OCCUPANCY

A. Prior Occupancy defined; Restrictions: Owner may, when legally permissible to do so and upon written Notice to Contractor, take possession of or use any completed or partially completed portion of the Work ("Prior Occupancy") at any time prior to Substantial Completion, and Contractor shall cooperate with such occupancy and use and the establishment of a punch list. Unless otherwise agreed in writing, Prior Occupancy shall not: be deemed an acceptance of any portion of the Work; accelerate the time for any payment to Contractor; prejudice any rights of Owner provided by any insurance, bond, guaranty, or the Contract Documents; relieve Contractor of the risk of loss or any of the obligations established by the Contract Documents; establish a date of Substantial or Final Completion; establish a date for termination or partial termination of the assessment of liquidated damages; or constitute a waiver of claims.

B. Damage; Duty to repair and warranties: Notwithstanding anything in the preceding paragraph, Owner shall be responsible for loss of or damage to the Work resulting from Prior Occupancy. Contractor’s one year duty to repair any system warranties shall begin on building systems activated and used by Owner as agreed in writing by Owner and Contractor.

6.7 FINAL COMPLETION, ACCEPTANCE, AND PAYMENT

A. Final Completion defined: Final Completion shall be achieved when the Work is fully and finally complete in accordance with the Contract Documents. The date Final Completion is achieved shall be established by Owner in writing, but in no case shall it constitute Final Acceptance, which is a subsequent, separate, and distinct action.

B. Final Acceptance defined: Unless otherwise determined by Owner, Final Acceptance shall be achieved after Contractor has completed all the requirements of the Contract Documents. The date Final Acceptance is achieved shall be established by Owner in writing. Pursuant to RCW 60.28, "Lien for Labor, Materials, Taxes on Public Works," completion of the Contract Work shall occur upon Final Acceptance. Neither Final Acceptance nor final payment shall release Contractor or its sureties from any obligations of these Contract Documents or the payment and performance bonds, or constitute a waiver of any claims by Owner arising from Contractor’s failure to perform the Work in accordance with the Contract Documents.

C. Final payment waives Claim rights: Acceptance of final payment by Contractor or any Subcontractor shall constitute a waiver and release to Owner of all claims by Contractor or any such Subcontractor for an increase in the Contract Sum or the Contract Time, and for every act or omission of Owner relating to or arising out of the Work, except for those Claims made in accordance with the procedures, including the time limits, set forth in Section 8.
PART 7 – CHANGES

7.1 CHANGE IN THE WORK

A. **Changes in the Work:** Changes in the Work may be accomplished after execution of the Contract without invalidating the Contract. Changes in the Work are recognized and incorporated into the Contract solely by Change Order and are subject to the limitations stated in this Part 7 and elsewhere in the Contract Documents. A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone. Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

B. **Change Order:** A Change Order is a written instrument signed by the Owner, Contractor, and Architect that modifies or amends the Contract Documents by setting forth: (1) a change in the Work, (2) the amount of any adjustment in the Contract Sum, and (3) the extent of any adjustment in the Contract Time. The Change Order shall constitute full payment and final settlement of all claims for time and direct, indirect, and consequential costs, including costs of delays, inconvenience, disruption of schedule, or loss of efficiency or productivity, related to any Work either covered or affected by the Change Order, or related to the events giving rise to the Change Order.

C. **Change Order Proposal from Contractor:** If Contractor at any time believes that a change in the Work has occurred that involves a change in the Contract Sum and/or Contract Time, Contractor shall provide written Notice to Owner in accordance with Section 8. Contractor’s failure strictly to follow the procedure set forth in the Contract Documents shall waive any right of Contractor to a change in the Contract Sum or Contract Time on account of any such change in the Work.

D. **Owner-Initiated Changes:** For an Owner-initiated change or directive, Owner may

1. **Request a written Change Order Proposal (COP) from Contractor.** Contractor shall submit a COP within 14 Days of the request from Owner, or within such other period as mutually agreed. Contractor’s COP shall be full compensation for implementing the proposed change in the Work, including any adjustment in the Contract Sum or Contract Time, and including compensation for all delays in connection with such change in the Work and for any expense or inconvenience, disruption of schedule, or loss of efficiency or productivity occasioned by the change in the Work. Upon receipt of the COP, Owner may accept the proposal and incorporate it into Change Order, reject the proposal, request further documentation, or negotiate acceptable terms with Contractor.

2. **Issue a Construction Change Directive (CCD).** Pending execution of a Change Order, Owner may issue a CCD directing Contractor to proceed immediately with the Work. A CCD is a written order prepared by Owner that directs Contractor to perform Work prior to total agreement on an adjustment, if any, in the Contract Sum and/or Contract Time. Owner may direct Contractor through a CCD, at any time and without
invalidating the Contract, to proceed with a change in the Work or to perform Work that Contractor contends to be a change in the Work, with or without the agreement of Contractor and prior to agreement of the basis for adjustment, if any, to the Contract. Owner’s use of a CCD does not constitute agreement that the directive constitutes a change in the Work, the Contract Sum or the Contract Time. All Work done pursuant to an Owner-directed change in the Work shall be executed in accordance with the Contract Documents. Upon receipt of a CCD, Contractor shall promptly commence and proceed diligently with performance of the directed Work. Within 7 Days of its receipt of a CCD, Contractor shall notify Owner in writing either (a) of its acceptance of its terms, in which case the terms will become effective, and the CCD will be incorporated into a Change Order, or (b) of Contractor’s rejection of the terms, in which case Contractor must submit a written Rejection within 14 Days after Contractor delivered written Notice to Owner as noted above. The written Rejection must fully explain the reasons for rejecting the CCD and include all necessary supporting documentation. Failure to submit written Notice within 7 Days of Contractor’s receipt of a CCD or a written Rejection with 14 Days after delivery of written Notice shall constitute Contractor’s acceptance of the terms of the CCD. Contractor’s Rejection of a CCD shall not relieve Contractor of its obligation to comply promptly with the CCD.

E. Contractor fault or negligence alleged as basis for change in Contract Sum: No change in the Contract Sum shall be allowed to the extent Contractor’s changed cost of performance is due to the fault or negligence of Contractor or anyone for whose acts Contractor is responsible; or to the extent Contractor is responsible for change concurrently caused by Contractor and Owner; or to the extent the change is caused by an act of Force Majeure as defined in this Agreement.

7.2 CHANGE IN THE CONTRACT SUM

A. Contract Sum changes only by Change Order: The Contract Sum shall only be changed by a Change Order. Contractor shall include any request for a change in the Contract Sum in its COP.

B. Allowances: Any Allowances stated in the Contract Documents shall be included in the Contract Sum. Items covered by Allowances shall be supplied for such amounts and by such persons or entities as Owner may direct, but Contractor shall not be required to employ persons or entities to whom Contractor has made reasonable and timely objection. Owner shall select materials and equipment under an Allowance with reasonable promptness. Allowances shall cover the net cost to Contractor of materials and equipment delivered and/or installed at the site, as identified in the Allowance, and all required taxes, less applicable trade discounts. Whenever actual costs are more than or less than Allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect the difference between actual, reasonable costs and the Allowances.

C. Methods for Calculating Change Order Pricing: The value of any Work covered by a Change Order or any adjustment to the Contract Sum shall be determined by fixed price, unless otherwise agreed to by Owner. The following procedures shall apply with respect to pricing:
a. **Breakdown and itemization of details on COP**: Contractor’s COP shall be accompanied by a complete itemization of the costs, including labor, material, subcontractor costs, and overhead and profit. The costs shall be itemized in the manner set forth below, and shall be submitted on breakdown sheets in a form approved by Owner. If the total cost of the change in the Work does not exceed $2,000, Contractor shall not be required to submit a breakdown if the description of the change in the Work is sufficiently definitive for Owner to determine fair value.

b. **Use of industry standards in calculating costs**: All costs shall be calculated based upon appropriate industry standard methods of calculating labor, material quantities, and equipment costs such as R.S. Means or other standards acceptable to the Owner and Contractor.

c. **Markups on additive and deductive Work**: The cost of any additive or deductive changes in the Work shall be calculated as set forth below. Where a change in the Work involves additive and deductive work by the same Contractor or Subcontractor, small tools, overhead, profit, bond and insurance markups will apply to the net difference.

d. **Components of Increased Costs**: Any request for an adjustment of the Contract Sum shall include only the following

   i. **Craft labor costs**: These are the labor costs determined by multiplying the estimated or actual additional number of craft hours needed to perform the change in the Work by the hourly labor costs. Craft hours should cover direct labor, as well as indirect labor due to trade inefficiencies. The hourly costs shall be based on the following:

      1. Basic wages and benefits: Hourly rates and benefits as stated on the Department of Labor and Industries approved "statement of intent to pay prevailing wages" or a higher amount if approved by the Owner. Direct supervision shall be a reasonable percentage not to exceed 15% of the cost of direct labor. No supervision markup shall be allowed for a working supervisor's hours.

      2. Federal insurance: Direct contributions required by the Federal Insurance Compensation Act; Federal Unemployment Tax Act; and the State Unemployment Compensation.

      3. Travel allowance: Travel allowance and/or subsistence, if applicable, not exceeding those allowances established by regional labor union agreements, which are itemized and identified separately.

      4. Safety: Cost incurred due to the Washington Industrial Safety and Health Act, which shall be a reasonable percentage not to exceed 2% of the sum of the amounts calculated in (1), (2), and (3) above.

   ii. **Material costs**: This is an itemization of the quantity and cost of materials needed to perform the change in the Work. Material costs shall be developed first from actual known costs, second from supplier quotations or if these are not available, from standard industry pricing guides. Material
costs shall consider all available discounts. Freight costs, express charges, or special delivery charges, shall be itemized.

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

1. The Equipment Watch Fleet Manager Estimator Package (digital). The maximum rate for standby equipment shall not exceed that shown in the Associated General Contractors Washington State Department of Transportation (AGC WSDOT) Equipment Rental Agreement, current edition on the Contract execution date.
2. The National Electrical Contractors Association for equipment used on electrical work.
3. The Mechanical Contractors Association of America for equipment used on mechanical work.

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

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

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

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

v. **Allowance for overhead and profit:** This is defined as costs of any kind attributable to direct and indirect delay, acceleration, or impact, added to the total cost to Owner of any change in the Contract Sum. This allowance shall compensate Contractor for all non-craft labor, temporary construction facilities, field engineering, schedule updating, as-built drawings, home office cost, B&O taxes, office engineering, estimating costs, additional overhead because of extended time, profit, and any other cost incidental to the change in the Work. It shall be strictly limited in all cases to a reasonable amount, mutually acceptable, not to exceed the rates below:

1. Additive or Deductive Change Orders Performed by Contractor: 7 percent overhead and profit
2. Additive or Deductive Change Order for Work performed by Subcontractor(s): 5 percent overhead and profit for Contractor and 10 percent overhead and profit for Subcontractor(s).

vi. Insurance and bond premiums: Cost of change in insurance or bond premium, which shall be added after overhead and profit are calculated in accordance with paragraph (v) above: This is defined as:
   1. Contractor’s liability insurance: The cost of any changes in Contractor’s liability insurance arising directly from execution of the Change Order; and
   2. Payment and Performance Bond: The cost of the additional premium for Contractor’s bond arising directly from the changed Work.

D. Deductive Change or Credit: The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

7.3 CHANGE IN THE CONTRACT TIME

A. Changes in Contract Time: The Contract Time shall only be changed by a Change Order. Claims relating to time shall be made in accordance with Section 8.

B. Time extension permitted only if delay is not Contractor’s fault: If Contractor is delayed at any time in the commencement or progress of the Work (1) by an act or neglect of Owner or anyone for whose acts Owner is responsible; or (2) by changes ordered by Owner in the Work; or (3) by Force Majeure; or (4) by delay authorized by Owner pending dispute resolution; or (5) by other causes that Owner determines may justify delay, then Contractor shall reasonably attempt to mitigate the delay, and the Contract Time shall be extended by Change Order for such reasonable time as Owner may reasonably determine consistent with the provisions of the Contract Documents. No adjustment in the Contract Time shall be allowed to the extent Contractor’s changed time of performance is due to the fault or negligence of Contractor or anyone for whose acts Contractor is responsible.

C. Contractor must demonstrate impact on critical path of schedule: Any change in the Contract Time covered by a Change Order or Claim shall be limited to the change in the critical path of the Work attributable to the change or event(s) giving rise to the Change Order or Claim. Contractor shall be responsible for showing clearly on the Progress Schedule that the change or event had a specific impact on the critical path and, except in case of concurrent delay, was the sole cause of such impact, and could not have been avoided by resequencing of the Work or other reasonable alternatives.

D. Cost arising from change in Contract Time: Provided Contractor has strictly complied with the procedures set forth in Section 7 and Section 8, Contractor is entitled to compensation for the cost of a change in Contract Time only if all the following conditions are met:
1. **Must be solely fault of Owner:** The change in Contract Time must solely be caused by the fault or negligence of Owner or others for whom Owner is responsible;

2. **Demonstrate impact on critical path:** Contractor must establish the extent of the change in Contract Time in accordance with Section 7.3C. Owner is not obligated directly or indirectly for damages or an increase in the Contract Sum for any delay suffered by a Subcontractor that does not increase the Contract Time; and

3. **Limitations on Costs:** Neither Contractor nor a Subcontractor of any tier is entitled to payment for costs arising out of actual or alleged loss of efficiency; morale, fatigue, attitude, or labor rhythm; home office overhead; expectant underrun; trade stacking; reassignment of workers; rescheduling of work; concurrent operations; dilution of supervision; learning curve; beneficial or joint occupancy; logistics; ripple; season change; extended overhead; profit upon damages for delay; impact damages, including cumulative impact; or similar damages.

**PART 8 – CLAIMS AND DISPUTE RESOLUTION**

8.1 **CLAIMS**

A. **Definition:** A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of the Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract Documents. The term “Claim” also includes other disputes and matters in question between Owner and Contractor arising out of or relating to the Contract Documents. Claims must be initiated in writing and be made in accordance with the Contract Documents.

B. **Continuing Contract performance:** Pending final resolution of a Claim, including the dispute resolution process, and except as otherwise agreed in writing or in the Contract Documents, Contractor shall proceed diligently with performance of the Work and maintain the Progress Schedule, and Owner shall continue to make payments of undisputed amounts in accordance with the Contract Documents.

C. **Claims for additional cost:** If Contractor wishes to make a Claim for an increase in the Contract Sum, written Notice as provided herein shall be given before proceeding to execute the Work, and written Notice and a written Claim must be made in accordance with this Part 8, or it will be waived.

D. **Claims for additional time:** If Contractor wishes to make a Claim for an increase in the Contract Time, written Notice as provided herein shall be given, and a written Claim must be made in accordance with this Part 8, or it will be waived.

E. **Claims for consequential damages:** Contractor and Owner waive certain Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes damages incurred by Owner for income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and damages incurred by Contractor for principal and home office overhead and expenses including but not limited to the compensation of personnel stationed there, for loss of financing, business and/or reputation, for losses on other
projects, for loss of profit, and for interest or financing costs. This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination. Nothing contained in this subparagraph, however, shall be deemed to preclude an award of Owner’s liquidated or other Owner delay damages, when applicable, in accordance with the Contract Documents, or to preclude or limit Contractor’s obligation to indemnify Owner for damages, including direct, indirect or consequential damages, alleged by a third party.

8.2 CLAIMS PROCESS

A. Notice and Claims: Contractor shall provide Notice of any Claim within 14 Days of the event giving rise to the Claim. Contractor shall then provide its Claim, with substantiation as required in Paragraph B herein, no later than 20 Days after Contractor’s submittal of its Notice of Claim. Any Notice and any Claim of Contractor, whether under the Contract or otherwise, must be made pursuant to and in strict accordance with the applicable provisions of the Contract Documents. No act, omission, or knowledge, actual or constructive, of Owner or anyone for whose acts Owner is responsible shall in any way be deemed to be a waiver of the requirement for timely written Notice and a timely written Claim unless Owner and Contractor sign an explicit, unequivocal written waiver. The fact that Owner and Contractor may consider, discuss, or negotiate a Claim that has or may have been procedurally or substantively defective or untimely under the Contract shall not constitute a waiver of the provisions of the Contract Documents unless Owner and Contractor sign an explicit, unequivocal written waiver. Contractor acknowledges and agrees that Contractor’s failure to timely submit required Notices and/or timely submit Claims has a substantial impact upon and prejudices Owner, including but not limited to its inability to fully investigate or verify the Claim, mitigate damages, choose alternative options, adjust the budget, delete or modify the impacted Work, and/or monitor time, cost and quantities, and shall result in waiver of Contractor’s Claim.

B. Claim must cover all costs and be documented: A Claim shall be deemed to cover all changes in cost and time (including direct, indirect, impact, and consequential) to which Contractor (and Subcontractors) may be entitled and may not contain reservations of rights without Owner’s written approval; any such unapproved reservations of rights shall be without effect. At a minimum, a Claim shall contain the following information:

1. Factual statement of Claim: A detailed factual statement of the Claim for additional compensation and/or time, if any, providing all necessary dates, locations, and items of Work affected by the Claim and confirming the damages asserted (time and cost) are actually caused by and/or a result of the act, event, or condition complained of;

2. Dates: The date on which event(s) arose which gave rise to the Claim;

3. Individuals knowledgeable about Claim: The name of each individual, including but not limited to employees of Contractor, Subcontractors, Owner and/or A/E believed to be knowledgeable about the Claim;

4. Support from Contract Documents: The specific provisions of the Contract Documents that support the Claim;
5. **Identification of other supporting information:** The identification of any documents and the substance of any oral communications that support the Claim;

6. **Copies of supporting documentation:** Data and copies of any identified documents, other than the Contract Documents, that support the Claim;

7. **Details on Claim for Contract Time:** If an adjustment in the Contract Time is sought, the specific days and dates for which it is sought; the specific reasons Contractor believes an extension in the Contract Time should be granted, and Contractor's analysis of its Progress Schedule to demonstrate the reason for the extension in Contract Time.

8. **Details on Claim for adjustment of Contract Sum:** If an adjustment in the Contract Sum is sought, the exact amount sought and a breakdown of that amount into the categories and with the detail required by Section 7; and

9. **Statement certifying Claim:** A statement certifying, under penalty of perjury, that the Claim is made in good faith, that the supporting cost and pricing data are true and accurate to the best of Contractor's knowledge and belief, that the Claim is fully supported by the accompanying data, and that the amount requested accurately reflects the adjustment in the Contract Sum or Contract Time for which Contractor believes Owner is liable.

C. **Waiver of rights:** Any Claim of Contractor against Owner shall be conclusively deemed to have been waived by Contractor unless made in accordance with the requirements of Part 8.

D. **Owner may investigate:** To assist in the review of a Claim, Owner may at any time visit the Project site, communicate directly with Subcontractors, or request additional information (including requesting an audit as authorized below) in order to fully evaluate the issues raised by the Claim.

E. **Owner may audit Claims:** All Claims filed against Owner shall be subject to audit at any time following the filing of the Claim. Failure of Contractor or Subcontractors of any tier to permit Owner access to the books and records of Contractor or Subcontractors of any tier, or to maintain and retain sufficient records to allow Owner to verify all or a portion of the Claim, shall constitute a waiver of the Claim and shall bar any recovery. The audit may be performed by employees or representatives of Owner. Contractor and its Subcontractors shall provide adequate facilities acceptable to Owner for the audit during normal business hours. Contractor and all Subcontractors shall make a good faith effort to cooperate with Owner's auditors.

F. **Reciprocal RCW 42.56 rights:** Contractor agrees, on behalf of itself and Subcontractors, that any invocation of RCW 42.56 at any time by Contractor or a Subcontractor, or their respective representatives, shall initiate an equivalent right to disclosures from Contractor and Subcontractors for the benefit of Owner. Failure to fully comply with these requirements shall constitute a material breach of the Contract and shall constitute a waiver of all Claims by Contractor and any Subcontractor that does not fully comply.
8.3 FORMAL RESOLUTION OF CLAIMS

A. Mediation Required: To the extent a Claim is not resolved by Owner and Contractor, Claims, disputes, or other matters in controversy arising out of or related to the Contract shall be subject to mediation as a condition precedent to the initiation of binding dispute resolution. This requirement cannot be waived except by an explicit written waiver signed by both Owner and Contractor. Unless Owner and Contractor mutually agree in writing otherwise, all unresolved Claims shall be considered at a single mediation session that shall occur after Substantial Completion and prior to Final Acceptance by Owner. A request for mediation shall be delivered in writing to the other party to the Contract, and the parties shall promptly attempt to mutually agree on a mediator. If the parties do not agree on a mediator within 30 Days of a party’s demand, the mediation, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. Mediation shall proceed in advance of binding dispute resolution proceedings. The parties to the mediation shall share the mediator’s fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction.

B. Litigation: Contractor may not commence litigation on a Claim unless the Claim has been raised and considered in accordance with the procedures of this Part 8, including mandatory mediation. Contractor shall have the burden to demonstrate in any litigation that it has complied with all requirements of this Part 8. All unresolved Claims of Contractor shall be waived and released unless Contractor has complied with the time limits of the Contract Documents, and litigation is served and filed within 180 Days after the Date of Substantial Completion approved in writing by Owner. This requirement cannot be waived except by an explicit, written waiver signed by Owner and Contractor. The pendency of a mediation, which shall mean the time period between a party’s receipt of a written mediation demand and the date of the initial mediation session, shall stay this deadline for serving and filing a lawsuit. The deadline may also be stayed for an additional period by agreement of the parties or court order. Neither Contractor nor a Subcontractor, whether claiming under a bond or lien statute or otherwise, shall be entitled to attorneys’ fees directly or indirectly from Owner (but may recover attorneys’ fees from the bond or statutory retainage fund itself to the extent allowable under law).

PART 9 – TERMINATION OF THE WORK

9.1 TERMINATION BY OWNER FOR CAUSE

A. Notice to Terminate for Cause: Owner may, upon 7 Days written notice to Contractor and to its surety, terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for cause upon the occurrence of any one or more of the following events:

1. Contractor repeatedly refuses or fails to prosecute the Work or any portion thereof with sufficient diligence to ensure Substantial Completion of the Work within the Contract Time;

2. Contractor is adjudged bankrupt, makes a general assignment for the benefit of its creditors, or a receiver is appointed on account of its insolvency;
3. Contractor repeatedly refuses or fails in a material way to replace or correct Work not in conformance with the Contract Documents;

4. Contractor repeatedly refuses or fails to supply skilled workers or proper materials or equipment;

5. Contractor repeatedly refuses or fails to make prompt payment due to Subcontractors or for labor;

6. Contractor materially disregards or fails to comply with laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction; or

7. Contractor is otherwise in material breach of any provision of the Contract Documents.

B. Owner's actions upon termination: Upon termination, Owner may at its option:

1. Exclude the Contractor from the Site and/or take possession of the Project site and take possession of or use all materials, equipment, tools, and construction equipment and machinery thereon owned by Contractor to maintain the orderly progress of, and to finish, the Work;

2. Accept assignment of subcontracts pursuant to Section 5; and

3. Finish the Work by whatever other reasonable method it deems expedient.

C. Payment upon Termination: If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for A/E’s services and expenses made necessary thereby and any other extra costs or damages incurred by Owner in completing the Work, or as a result of Contractor’s actions, or any other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall survive termination of the Contract.

D. Contractor and Surety still responsible for Work performed: Termination of the Work in accordance with this section shall not relieve Contractor or its surety of any responsibilities for Work performed.

E. Conversion of “Termination for Cause” to “Termination for Convenience”: If Owner terminates Contractor for cause and it is later determined that none of the circumstances set forth in paragraph 9.01A exist, then such termination shall be deemed a termination for convenience pursuant to Section 9.

9.2 SUSPENSION OR TERMINATION BY OWNER FOR CONVENIENCE

A. Owner Notice of Suspension or Termination for Convenience: Owner may, upon written notice, suspend or terminate (without prejudice to any right or remedy of Owner) the Work, or any part of it, for the convenience of Owner.
B. **Contractor Response to Termination Notice:** Unless Owner directs otherwise, after receipt of a written notice of suspension or termination for either cause or convenience, Contractor shall promptly:

1. Stop performing Work on the date and as specified in the notice of suspension or termination;

2. Place no further orders or subcontracts for materials, equipment, services or facilities, except as may be necessary for completion of such portion of the Work as is not suspended or terminated;

3. For Work terminated, cancel all orders and subcontracts, upon terms acceptable to Owner, to the extent that they relate to the performance of Work terminated;

4. For Work terminated, assign to Owner all of the right, title, and interest of Contractor in all orders and subcontracts to the extent that they relate to the performance of Work terminated;

5. Take such action as may be necessary or as directed by Owner to preserve and protect the Work, Project site, and any other property related to this Project in the possession of Contractor in which Owner has an interest; and

6. Continue performance only to the extent not terminated or suspended.

C. **Terms of adjustment in Contract Sum if Contract terminated or suspended:** If Owner terminates or suspends the Work or any portion thereof for convenience, Contractor shall be entitled to make a request for an equitable adjustment for its reasonable direct costs incurred during the period of suspension or prior to the effective date of the termination, plus reasonable allowance for overhead and profit on Work performed prior to termination, plus the reasonable administrative costs of the termination, but shall not be entitled to any other costs or damages, whatsoever, provided however, the total sum payable upon termination shall not exceed the Contract Sum reduced by prior payments. Contractor shall be required to make its request in accordance with the provisions of Part 7. Failure of Contractor to comply with the requirements of Part 7 shall result in waiver of Contractor’s claim.

D. **Owner to determine whether to adjust Contract Time:** If Owner terminates the Work or any portion thereof for convenience, the Contract Time shall be adjusted as determined by Owner.

### 9.3 TERMINATION BY CONTRACTOR FOR CAUSE

A. **Contractor termination:** Except as provided by RCW 60.28.080, Contractor may terminate the Contract for any of the following reasons:

1. Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped permanently;
2. An act of government, such as a declaration of national emergency, that requires all Work to be stopped permanently; or

3. The Work is stopped for a period of 60 consecutive Days through no act or fault of Contractor, a Subcontractor, or their agents or employees or any other persons or entities performing portions of the Work under direct or indirect contract with Contractor.

B. Contractor termination procedure: If one of the above reasons exists, Contractor may, upon seven (7) Days' written Notice to Owner (during which period Owner has the opportunity to cure), terminate the Contract and recover from Owner payment for Work executed in accordance with the Contract Documents, including reasonable overhead and profit on Work executed and costs incurred by reason of such termination. The total recovery of Contractor shall not exceed the unpaid balance of the Contract Sum.

9.4 OWNER’S RIGHT TO STOP AND/OR CARRY OUT THE WORK FOR CAUSE

A. Owner may stop Work for Contractor's failure to perform: If Contractor fails or refuses to perform its obligations in accordance with the Contract Documents, Owner may order Contractor, in writing, to stop the Work, or any portion thereof, until Owner has accepted satisfactory corrective action.

B. Owner may carry out the Work after Contractor's failure to perform: If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a 14-Day period after receipt of written Notice from Owner to commence and continue to make reasonable progress toward the correction of such default or neglect with diligence and promptness, Owner may, without prejudice to other remedies Owner may have, correct such deficiencies, and an appropriate Change Order shall be issued deducting from payments then or thereafter due Contractor the reasonable cost of correcting the deficiencies, including Owner’s expenses and compensation for A/E’s additional services made necessary by the default, neglect or failure. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall pay the difference to Owner.

C. No equitable adjustment for Contractor's failure to perform: Contractor shall not be entitled to an equitable adjustment in the Contract Time or Contract Sum for any increased cost or time of performance attributable to Contractor’s failure or refusal to perform or from any reasonable remedial action taken by Owner based upon such failure.

PART 10 – MISCELLANEOUS PROVISIONS

10.1 MISCELLANEOUS PROVISIONS

A. Applicable law and venue: The Contract Documents and the rights of the parties herein shall be governed by the laws of the state of Washington and the City of Kirkland, without regard to its choice-of-law provisions. Venue shall be in King County.

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

C. Meaning of words used in Contract Documents: Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Reference to standard Specifications, manuals, or codes of any technical society, organization, or association, or to the code of any governmental authority, whether such reference is specific or by implication, shall be to the latest standard specification, manual, or code in effect on the date for submission of bids, except as may be otherwise specifically stated. Wherever in the Drawings and Specifications an article, device, or piece of equipment is referred to in the singular manner, such reference shall apply to as many such items as are shown on the Drawings, or required to complete the installation.

D. No waiver of rights: Waiver of any provisions of the Contract Documents must be in writing and authorized by Owner. No other waiver is valid on behalf of Owner. No action, delay in acting, or failure to act by Owner or A/E shall constitute a waiver of a right or duty afforded under the Contract Documents, nor shall action, delay in acting, or failure to act constitute approval or an acquiescence in a breach therein, or otherwise prejudice the right of Owner to enforce a right or remedy at any subsequent time, except as may be specifically agreed in writing.

E. Rights under Contract do not limit other rights: Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

F. Severability: If any portion of this Contract is held to be void or unenforceable, the remainder of the Contract shall be enforceable without such portion.

G. Contractor must be registered and licensed: Pursuant to RCW 39.06, Contractor shall be registered and licensed as required by the laws of the State of Washington, including but not limited to RCW 18.27. Contractor shall also have a current state unified business identifier number; have industrial insurance coverage for Contractor's employees working in Washington as required in Title 51 RCW; have an employment security department number as required in Title 50 RCW; have a state excise tax registration number as required in Title 82 RCW; and not be disqualified from bidding on any public works contract under RCW 39.06.010 (unregistered or unlicensed contractors) or RCW 39.12.065(3) (prevailing wage violations).

H. Employer contributions: Pursuant to RCW 50.24, "Contributions by Employers," in general and RCW 50.24.130 in particular, Contractor shall pay contributions for wages for personal services performed under this Contract or arrange for a bond acceptable to the Commissioner.
I. Apprenticeship requirements: If the Contract Sum for the Project exceeds one million dollars, Contractor shall comply with all applicable apprenticeship requirements, including but not limited to RCW 39.04.320. For each Project that has apprenticeship requirements, the Contractor shall submit a “Statement of Apprentice and Journeyman Participation” in a format approved by the City with every request for progress payment. The Contractor shall submit consolidated and cumulative data collected by the Contractor and collected from all subcontractors by the Contractor.

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

K. Six year records retention period: The wage, payroll, and cost records of Contractor, and its Subcontractors, and all records subject to audit, shall be retained for a period of not less than 6 years after the date of Final Acceptance. The Contractor agrees to provide access to and copies of any records related to this Agreement as required by the City to audit expenditures and charges and/or to comply with the Washington State Public Records Act.

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

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

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

O. Contractor is independent contractor: Contractor shall be and operate as an independent contractor in the performance of the Work and shall have complete control over and responsibility for all personnel performing the Work. Contractor is not authorized to enter into any agreements or undertakings for or on behalf of Owner or to act as or be an agent or employee of Owner.

P. Owner’s role is limited: Owner will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety
precautions and programs in connection with the Work, since these are solely Contractor’s responsibility under the Contract Documents. The presence of Owner at the Project site shall not in any manner be construed as assurance that the Work is being completed in compliance with the Contract Documents, nor as evidence that any requirement of the Contract Documents of any kind, including Notice, has been met or waived. Owner will not be responsible for Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. Owner will not have control over or charge of and will not be responsible for acts or omissions of Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

END OF SECTION
# Contractor's Affidavit of Release

## Section 00 82 75

### Contractor's Affidavit of Release of Claims and Liens

| To OWNER: | City of Kirkland  
123 5th Avenue  
Kirkland, WA 98033 |
|------------|--------------------|
| From CONTRACTOR: | [Contractor Name]  
[Address]  
[City, State, Zip Code] |

### Conditional Release

The undersigned does hereby acknowledge and certify that upon receipt of a check from [beneficiary], in the sum of $_______ and when the check has been properly endorsed and has been paid by the bank upon which it was drawn, this document shall become effective to release any and all claims for compensation, impacts, additional time, costs, and rights of Claim or lien which the undersigned has on the referenced Project for labor, services, equipment, materials furnished and/or claims through (Date:) _______________ except it does not cover any retention or items furnished thereafter. Before any recipient of this document relies on it, said party should verify evidence of payment to the undersigned. Items and Claims not waived and released by this Instrument:

### Unconditional Release

The undersigned does hereby acknowledge and certify that the undersigned has been paid and has received progress payments in the sum of $_______ for labor, services, equipment or materials furnished to the above referenced Project and does hereby release any and all claims for compensation, impacts, additional time, costs and rights of Claim or lien which the undersigned has on the above referenced Project through (Date:) _______________ only and does not cover any retention or items furnished after that date. Items and Claims not waived and released by this Instrument:

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**NOTICE:** THIS DOCUMENT WAIVES RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL RELEASE FORM.

---

I CERTIFY UNDER PENALTY OF PERJURY UNDER LAWS OF THE STATE OF WASHINGTON THAT THE ABOVE IS A TRUE AND CORRECT STATEMENT.

Signature: ____________________________  
(Authorized Corporate Officer/Partner/Owner)  
Printed Name: ____________________________  
Title: ____________________________  
DATED: _______ 20__ at _______________  
(City, State)

---

I CERTIFY UNDER PENALTY OF PERJURY UNDER LAWS OF THE STATE OF WASHINGTON THAT THE ABOVE IS A TRUE AND CORRECT STATEMENT.

Signature: ____________________________  
(Authorized Corporate Officer/Partner/Owner)  
Printed Name: ____________________________  
Title: ____________________________  
DATED: _______ 20__ at _______________  
(City, State)

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END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Prevailing wage rates for the locality or localities of the Work, as described by the Industrial Statistician of the Department of Labor and Industries, are required for this contract. Contractor remains solely responsible for verifying that the rates are accurate, current, and inclusive for all parts of this Work. Any off-site prefabrication may also require prevailing wages and the Contractor should contact the Department of Labor and Industries to ascertain those rates.

B. Contractor to provide the “Notice of Intent to Pay Prevailing Wage Rates”, as required by RCW 39.04, 39.12, 43.19, and 49.28 as amended. All paperwork regarding “Notice of Intent to Pay Prevailing Wage Rates” shall be sent directly to the Owner. The rules and regulations of the Department of Labor and Industries and the schedule of prevailing wage rates for the locality or localities where this Contract will be performed as determined by the Industrial Statistician of the Department of Labor and Industries, are by reference made a part of this Contract as though fully set forth herein.

Current prevailing wage rates for King County will apply to this project. Current prevailing wage data are available online or at the following:

ADDRESS: Department of Labor and Industries
          Prevailing Wage Section
          P.O. Box 44540
          Olympia, Washington 98504-4540

http://www.lni.wa.gov/TradesLicensing/PrevailingWage/RateDatabase/default.asp

The General Contractor and his sub-contractors are to pay for all filing fees for Statements of Intent to Pay Prevailing Wages and Affidavits. Pay for any change in rate during the course of construction.

Submit forms to: Department of Labor and Industries
                Prevailing Wage Section
                P.O. Box 44540
                Olympia, Washington 98504-4540

END OF SECTION
SECTION 01 11 00
SUMMARY OF WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Project Manual including General Conditions, any Supplementary Conditions, Divisions 00 and Division 01 Specification Sections, Drawings, and any Addenda apply to work of this Section.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of furnishing all labor, materials and other incidentals for the construction of a new 3,030 square foot bathhouse facility with utilities, site work and playground. The project also includes two 920 square foot picnic pavilions. The project is subject to the Project Manual, Drawings, and any Addenda. The Project is located at 9703 NE Juanita Dr, Kirkland, WA 98034. The Architect's estimate is $2.5 million, including sales tax.

1.01 CONTRACTOR'S USE OF PREMISES

A. Contractor's use of premises for Work and storage is limited to the area shown.

B. During the entire construction period the Contractor shall have the exclusive use of the designated portion of the premises for construction operations. The Contractor shall limit his use of the premises to the work indicated. Confine operations at the site to the areas permitted. Portions of the site beyond areas on which work is indicated are not to be disturbed.

C. Owner and Contractor shall jointly sign a written transmittal of all items to be deconstructed and preserved for re-use. Contractor to provide a schedule of items to be remove and re-used. Owner shall approve this list. Contractor to ensure protection from damage by mishandling, improper storage, contamination, inadequate protection, pilferage or other actions that could diminish material's or items' value.

D. Hours of Work: The contractor shall limit their work to those hours allowed by the building permit. Typically, the City of Kirkland allows construction only between the hours of 7 am and 10 pm, Monday through Friday, and between the hours of 9 am and 10 pm on weekends. Any other times of work shall be by approval of the Owner.

E. Security: The contractor shall maintain general security of the job site during construction.

F. Parking: The Owner shall not provide any off-site parking or staging for the Contractor.

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G. Staging: The Owner shall not designate an off-site construction staging area. The Contractor shall prepare a staging plan to show locations of construction trailers and material storage within the project site.

H. Contractor shall install up to three City-provided informational signs at or near the two ends of the project's geographic limits. The informational signs will be chloroplast or aluminum signs up to 72 inches wide and 48 inches tall. The contractor will mount chloroplast signs to plywood sheets of the same size. This mounting can be skipped for aluminum signs. Contractor will install signs by setting two 4” x 4” x 10’ posts (per sign) 36” below grade, set apart consistent with the width of the sign, and backfilling with soil at a location agreed upon by the City and the Contractor. Secure the sign so the top is 7’ above ground level. Contractor will remove at substantial completion.

I. Miscellaneous: The Contractor shall:
1. Maintain pedestrian access to and around the site, including maintaining pedestrian access along the concrete promenade and the pier. Maintain vehicular access to and around the Park in areas not designated for Contractor use.
2. Not unreasonably encumber the site with materials or equipment.
3. Assume full responsibility for protection and safekeeping of products stored on premises.
4. Obtain and paying for the use of additional storage or work areas needed for operation.
5. Patching existing paving on roads and adjacent properties damaged by the contractor.
6. Repair, resurface, and re-stripe any area of the parking lot utilized by the Contractor for staging, operations, deliveries, or other construction activities. Repave with HMA Class ½-inch per City of Kirkland requirements.
7. Keep roads and sidewalks and the work area clean of dirt and other debris.
8. Maintain and protect all landscaping during construction from NTP to Physical Completion.

1.02 EXAMINATION

A. Persons performing Work shall examine surfaces to receive their Work and shall report in writing to Contractor, with copy to Architect, conditions detrimental to Work. Failure to examine and report makes the person responsible, at no increase in Contract Sum, for corrections Architect may require. Commencement of Work constitutes acceptance of surface.

1.03 COORDINATION OF WORK

A. Beginning June 1, 2020, Fridays are non-working days.

B. The City of Kirkland hosts various events throughout the year. Other than as specified above, the Contractor may continue Work, but should be aware that the events will be held as scheduled and the Contractor shall be prepared to work with the City of Kirkland to ensure the events can proceed as planned. Public access to these events shall not be blocked and the Contractor shall not inhibit public enjoyment of these events.
C.

<table>
<thead>
<tr>
<th>Service</th>
<th>Approximate Date</th>
<th>Approximate Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beach Volleyball Leagues</td>
<td>June 15th – Aug 31st</td>
<td>Volleyball Courts</td>
</tr>
<tr>
<td>Paddle board classes</td>
<td>June 15th – Aug 31st</td>
<td>Waterfront</td>
</tr>
<tr>
<td>Tennis/beach Youth camps</td>
<td>June 15th – Aug 31st</td>
<td>Park</td>
</tr>
<tr>
<td>Juanita Friday Market</td>
<td>June 1 – Sept 30</td>
<td>Parking Lot</td>
</tr>
<tr>
<td>Lifeguard Services</td>
<td>July 1 – Sept. 7</td>
<td>Beach</td>
</tr>
<tr>
<td>Children’s Triathlon</td>
<td>Sept 5th</td>
<td>Beach, Parking Lot</td>
</tr>
<tr>
<td>Paddle board rental</td>
<td>April – Oct 31st</td>
<td>Waterfront</td>
</tr>
<tr>
<td>Food vendor</td>
<td>April – Oct 31st</td>
<td>Waterfront</td>
</tr>
</tbody>
</table>

1.04 SEQUENCE OF CONSTRUCTION

A. The sequence of work will be in accordance with the construction schedule submitted by the Contractor and approved by the Architect. The construction schedule shall be based on the requirements of these Contact Documents, and on the Contractor prepared and Owner-approved detailed plans for the Work.

B. The City of Kirkland requires that the seasonal restroom portion of the new building be substantially complete, fully operational with certificate of occupancy, no later than July 1, 2020.

1.05 SURROUNDING SITE CONDITION SURVEY

A. Prior to commencement of Work Contractor, Owner, and Architect shall jointly survey the existing site, and surrounding conditions making permanent note of such existing damage as cracks, sags, or other similar damage. This record shall serve as a basis for determination of subsequent damage due to the Contractor's operations.

B. Owner and Contractor shall jointly sign a written transmittal of all items to be deconstructed and preserved for re-use. Contractor to provide a schedule of items to be remove and re-used. Owner shall approve this list. Contractor to ensure protection from damage by mishandling, improper storage, contamination, inadequate protection, pilferage or other actions that could diminish material’s or items’ value.

1.06 PROTECTION OF EXISTING STRUCTURES AND UTILITIES

A. The Drawings indicate existing above and below grade structures, drainage lines, storm drains, sewers, water, gas, electrical, and other similar items, and utilities which are known to the Owner.
B. The Contractor shall verify the location of all underground utilities before proceeding with trenching, or other operations which may cause damage, shall maintain them in service where appropriate, and shall repair any damage to them caused by the Work, at no increase in Contract Sum.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION
SECTION 01 25 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
A. Project Manual including General Conditions, any Supplementary Conditions, Divisions 00 and Division 01 Specification Sections, Drawings, and any Addenda apply to work of this Section.

1.02 REQUIREMENTS INCLUDE:
A. Promptly implement change order and field order procedures.
   1. Provide full written data required to evaluate changes.
   2. Maintain detailed records of work done including time and materials.
   3. Provide full documentation to Architect on request.

1.03 RELATED REQUIREMENTS:
A. Coordinate related requirements specified in other parts of Project Manual including but not limited to the following: Change Orders/General Conditions; Applications for Payment; Construction Schedules; Schedule of Values; Substitutions and Product Options; Project Record Documents.
B. Designate in writing the names of authorized members of Contractor's organizations who accept changes in the work, and are responsible for informing other workers of the authorized changes.
C. Contractor agrees; Architect approves; Owner authorizes.

1.04 DEFINITIONS:
A. Change Order: See General Conditions, Section 00 70 00.
B. Architect's Supplemental Instructions: Work order, instructions, or interpretations, signed by Architect making minor changes in the work not involving a change in Contract Sum or Contract Time.
C. Construction Change Authorization: Written order to the Contractor, signed by Owner, Architect and Contractor amending Contract Documents as described. This order authorizes Contractor to proceed with a change altering Contract Sum or Contract Time, and is to be included in a subsequent Change Order.

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1.05 PRELIMINARY INITIATION/CHANGES:

A. Changes may be initiated by Owner and Architect through a Proposal Request submitted to Contractor. Request will include:
   1. Detailed description of Change, Products, and location of change in Project.
   2. Supplementary or revised Drawings and Specifications.
   3. Projected time span for making change.
      a. Statement as to whether overtime work is, or is not, authorized.
   4. A specific period of time during which requested price will be considered valid.
   5. Documentation supporting any change in Contract Sum or Contract Time, as appropriate.

1.06 CONSTRUCTION CHANGE AUTHORIZATION:

A. In lieu of Proposal Request, Architect may issue a construction change authorization for Contractor to proceed with a change for subsequent inclusion in Change Order.

B. Authorization describes work change additions and deletions, with attachments of revised Contract Documents to define details and designate any change in Contract Sum and Contract Time.

C. Owner and Architect will sign and date as authorization to proceed with changes. General Contractor can not be paid for the work until it is incorporated into a change order and signed by all parties.

D. Contractor signs and dates to indicate agreement with terms.

1.07 DOCUMENTATION OF PROPOSALS AND CLAIMS:

A. Support each lump sum proposal quotation and each unit price (not previously established) with sufficient substantiating data.

B. On request provide additional data to support time and cost computations:
   1. Labor required; hours, hourly rate.
   2. Equipment required.
   3. Products required.
      a. Recommended source of purchase and unit cost.
      b. Quantities required of each material.
      c. Material unit costs and extended price.
   4. Taxes, insurance, and bonds.
   5. Documented credit for work deleted from Contract.
   6. Overhead and profit. (See General Conditions.)

C. Support each claim for additional costs, and time and material/force account work with documentation, as required for lump sum proposal. Include additional information:
   1. Name of Owner’s authorized agent who ordered work, and date of order.
2. Dates and times work was performed, and by whom.
3. Time record, summary of hours worked, and hourly rates paid.
4. Receipts and invoices for:
   a. Equipment used, listing dates and times of use.
   b. Products used, listing of quantities.
   c. Subcontracts.

D. Document requests for substitutions for Products as specified.

1.08 PREPARATION OF CHANGE ORDERS:

A. Architect will prepare Change Orders.
B. Change Order Form: AIA Document G701 or similar form.
D. All agreed-upon Change Orders shall be deemed full and final settlement of any and all claims of any kind, including without limitation those for direct or indirect costs or damages or for extension of time, relating to the subject matter of such Change Order.
E. Contractor shall not undertake any work or incur any expense that Contractor does not believe is included in the work required by the existing project contract documents, unless and until it brings such matter to Owner's attention and such work is authorized by a Construction Change Authorization or agreed Change Order. Contractor shall be deemed to have waived any and all claims of any kind with respect to any work undertaken or expense incurred in violation of this provision.

1.09 LUMP SUM/FIXED PRICE CHANGE ORDER:

A. Content of Change Orders will be based on, either:
   1. Architect's Proposal Request and Contractor's responsible Proposal as mutually agreed between Owner and Contractor.
   2. Contractor's Change Proposal, as recommended by Architect.
B. Proper signatures (dated) authorize you to proceed with changes.
C. Sign and date Change Order if you agree with terms.

1.10 UNIT PRICE CHANGE ORDER:

A. Content of Change Orders will be based on, either:
   1. Definition of extent of required changes.
   2. Contractor's Proposal for change, as approved with appropriate signatures.
   3. Survey of completed work.
B. The amount of unit prices is to be:

05/31/19
1. Any stated in the Bid Form/Agreement.
2. Those mutually agreed upon between Owner and Contractor.

C. When Change Order quantities can be determined prior to start of work:
   1. Appropriate listed persons will sign and date as authorization for you to proceed.
   2. Sign and date Change Order to indicate your agreement with terms.

D. When quantities cannot be determined prior to start of work the following procedures will be followed:
   1. Appropriately signed and issued construction Modification Proposal will authorize you to proceed on unit price basis, and cite applicable unit prices.
   2. At completion of change, Architect will determine cost of work based on unit prices and quantities used.
      a. Submit documentation establishing any claims for Contract Time change.
   4. All pertinent listed parties sign and date Change Order indicating their agreement.

1.11 TIME AND MATERIAL/FORCE ACCOUNT CHANGE ORDER/CONSTRUCTION CHANGE AUTHORIZATION:

A. Appropriately executed and signed Change Order authorizes you to proceed.

B. At completion of change, submit itemized accounting and supporting data as provided in Article "Documentation of Proposals and Claims" of this Section.

C. All concerned sign and date Change Order and/or Construction change authorization establishing change in Contract Sum and Contract Time.

D. Contractor signs and dates indicating his agreement.

1.12 CORRELATION WITH CONTRACTOR'S SUBMITTALS:

A. Quarterly revise Schedule of Values and Request for Payment forms to record each change as a separate item of work. Record adjusted Contract Sum.

B. Monthly revise Construction Schedule reflecting each change in Contract Time.
   1. Revise sub schedules to show changes for other items of work affected by changes.
   2. Upon completion of work under Change Order, enter pertinent changes in Record Documents.

1.13 DISTRIBUTION:

A. Send copies to all concerned parties.
   1. Change orders:
a. Upon authorization, Owner transmits one signed copy each to Contractor and Architect.
b. Construction Change Authorization:
c. Distribution of copies:
   1) One to Owner.
   2) One to Contractor.
   3) One to Architect.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 01 29 00
PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
   A. Project Manual including General Conditions, any Supplementary Conditions, Divisions 00 and Division 01 Specification Sections, Drawings, and any Addenda apply to work of this Section.

1.02 APPLICATIONS FOR PAYMENT
   A. Format and Data Required:
      1. Schedule of Values: Submit on AIA Document G703 or approved alternative.
      2. Applications for Payment: Submit on AIA Document G702 or approved alternative.

   B. Preparation of Application for Each Progress Payment:
      1. Application-Form:
         a. Fill in required information.
            1) Include Change Orders approved prior to Application Submittal date.
            2) Fill in summary of dollar values to agree with respective total indicated on any continuation sheets.
            3) Sign by responsible officer of Contract firm.
            4) Sign all copies; no photocopies of signatures permitted.
            5) Indicate for each line item, the percentage of completion as reflected in the dollar value of completed work.

         2. Continuation Sheets:
            a. Totally fill in all scheduled component work items. Show item number/scheduled dollar value/item/Schedule of Values.
            b. Fill in dollar value in each column for each scheduled line item.
               1) Round off values to nearest dollar. Tally Sheet.
               2) If no work has been performed entire zero.
            c. At end of continuation sheets, list each Change Order approved prior to submission date.
               1) List by Change Order Number, and description, as for an original component item of work.

   C. Post Addendums in field Specifications prior to first Progress Payment.

D. Substantiating Data for Final Payment:
   1. When Owner or Architect requires substantiating data, submit suitable information, with cover letter.
   2. Submit one copy of data and cover letter for each copy of Application.

E. Preparation of Application for Final Payment:
   1. Fill in application form, as specified, for progress payment.

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2. Use continuation-sheet for presenting final accounting statement, as specified: Project Closeout.

F. Submittal Procedure:
1. Submit Application for Payment at times stipulated in Agreement. Allow stipulated time for processing.
2. Number: Three (3) copies of each Application, unless otherwise directed at Pre-construction Meeting.
3. When Architect finds Application properly completed and correct, he transmits Payment Certificate to Owner.
4. If Architect finds application improperly or incorrectly executed, an annotated copy is returned for NEW SUBMITTAL.
5. Submit revised Progress Schedule with each Application for Payment.

PART 2 - PRODUCTS NOT USED

PART 3 - EXECUTION NOT USED

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Project Manual including General Conditions, any Supplementary Conditions, Divisions 00 and Division 01 Specification Sections, Drawings, and any Addenda apply to work of this Section.

1.02 PROJECT COORDINATION

A. General:
   1. Coordinate with Work of other Sections to ensure that all fixtures, devices, switches, outlets, ducts, pipes, and similar items can be installed as shown without modifications to framing. Provide all blockouts, raceways and similar framing as required.
   2. Coordinate the Work; do not delegate responsibility for coordination to any subcontractor.
   3. Anticipate interrelationship of all subcontractors and their relationship with the total Work.
   4. Resolve differences or disputes between subcontractors and materials suppliers concerning coordination, interference, or extent of Work between Sections. Contractor's decisions, if consistent with Contract Document requirements, shall be final.

1.03 MECHANICAL AND ELECTRICAL COORDINATION

A. "Tight" Conditions:
   1. Resolve all "tight" conditions involving Work of various Sections in advance of installation.
   2. If necessary, and before Work proceeds in these areas, prepare supplementary drawings for review showing all Work in "tight" areas.
   3. Provide supplementary drawings, and additional Work necessary to overcome "tight" conditions, at no increase in Contract Sum.

1.04 JOB SITE ADMINISTRATION

A. Field Measurements and Templates:
   1. Obtain field measurements required for accurate fabrication and installation of Work included in this Contract. Exact measurements are the Contractor's responsibility.
   2. Furnish or obtain templates, patterns, and setting instructions as required for installation of all Work. Verify in field.
B. Responsibility:
1. The Contractor shall be in charge of this Contract and the Site, as well as directing and scheduling of all Work.
2. Final responsibility for performance, interface, and completion of Work and Project shall be the Contractor's.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Comply with Specifications for each specific product involved.

PART 3 - EXECUTION

3.01 CUTTING AND PATCHING

A. Execute cutting and patching Work and structural reinforcing in a manner to prevent damage to other Work and to provide proper surfaces for installation of repairs, penetrations through surfaces, or other items.

B. For all new Work employ original installer or fabricator to perform cutting and patching for weather exposed or moisture resistance elements, fireproofing, and finished surfaces exposed to view.

C. Provide cutting and patching for all existing work, where mechanical and electrical utilities or similar services extend beyond limits of work for new construction, to match existing.

D. General: Provide and be responsible for all cutting, fitting, and patching required to complete the Work, or to:
1. Make its several parts fit together and to provide for installation of ill-timed Work.
2. Uncover portions of Work to provide for installation of ill-timed Work.
3. Remove and replace defective Work.
4. Remove and replace Work not conforming to Contract Document requirements.
5. Remove samples of installed Work as specified for testing.
6. Provide routine penetrations on non-structural surfaces for installation of piping.

E. Project Conditions:
1. Inspect existing conditions including elements subject to damage or movement during cutting and patching.
2. After uncovering Work, inspect conditions affecting installation of products or performance of Work.
3. Report unsatisfactory or questionable conditions to Architect in writing. Do not proceed with Work until Architect provides further instructions.
F. Materials:
1. Those required for original installation.
2. For any change in materials, submit request for substitution to Architect.

G. Preparation:
1. Provide adequate temporary support as required to assure structural value or integrity of the affected portion of the Work.
2. Provide devices and methods to protect other portions of the Project which may be exposed by uncovering Work.

H. Performance:
1. Execute cutting and patching by methods which will avoid damage to other areas, and will provide proper surfaces to receive patching and finishing. Cutting which will in any way impair the structural strength of the buildings will not be allowed. Pay all costs, as determined by Architect for remedial Work necessitated by cutting which impaired the structural integrity of the building.
2. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
3. Restore Work which has been cut or removed; install new products to provide completed Work in accordance with Contract Document requirements.

I. Adjust and fit products to provide a neat installation. Finish or refinish surfaces, as required, to match adjacent finishes. Repaint surfaces to nearest change in plane.

END OF SECTION
SECTION 01 31 20

PROJECT MEETINGS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Project Manual including General Conditions, any Supplementary Conditions, Divisions 00 and Division 01 Specification Sections, Drawings, and any Addenda apply to work of this Section.

1.02 PRECONSTRUCTION CONFERENCE

A. Prior to commencement of Work, a pre-construction conference will be held to discuss procedures to be followed.

B. Location: City of Kirkland, 123 5th Avenue, Kirkland, WA.

C. Attending shall be:
   1. Owner's representative.
   4. Contractor.
   5. Contractor's Superintendent.
   7. Permit Reviewer and City Inspector(s)
   8. Others as appropriate.

1.03 PROGRESS MEETINGS

A. Contractor shall prepare agenda, schedule, and hold periodic meetings as required by the progress of the Work. Architect shall record agreed action and resolutions in minutes of meeting and promptly distribute to attending parties.

B. Location: Contractor's field office.

C. Attending shall be:
   1. Architect.
   2. Architect's Professional Consultants, as appropriate to the agenda.
   3. Owner's Representative.
   4. Contractor.
   5. Contractor's Superintendent.
   6. Subcontractors, as appropriate to the agenda.
   7. Suppliers, as appropriate to the agenda.
   8. Others, as appropriate to the agenda.
PART 2 - PRODUCTS  - NOT USED

PART 3 - EXECUTION  - NOT USED

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 PROGRESS SCHEDULE

A. The Contractor shall prepare and submit to the Architect for review and approval prior to starting work at the site a comprehensive bar chart type progress Schedule that indicates a time bar for each significant category or unit of Work. The Contractor shall prepare the Schedule to indicate required sequencing of units, and to show time allowance for submittals, inspections and similar time margins. The Contractor shall show critical submittal dates related to each time bar, or prepare separate coordinated listing of critical submittal dates.

B. Following initial revision of Schedule after Architect’s review, print and distribute schedule to entities with a need-to-know responsibility, including two copies to Architect. The Contractor shall post the approved Schedule in the Contractor’s temporary office space. The Contractor shall review and update the Schedule coincident with payment request submission, and shall redistribute and re-post updated versions.

C. The Contractor shall update the Progress Schedule during construction every (2) two weeks to keep it current.

D. Contractor to email a weekly update progress report to the Owner’s representative and the Architect.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SUMMARY

A. Items requiring Shop Drawings, Product Data, and Samples are specified in the individual Sections. Submission of Shop Drawings, Product Data, and Samples is required only for those items where submittals are specified.

B. Unspecified submittals will not be reviewed by the Architect. Subcontractor's drawings, setting diagrams and similar information required by the Contractor for coordination shall remain between the Contractor and subcontractors and will not be reviewed by the Architect.

C. Related Sections:
   1. Product Substitution Procedures: Section 01 60 00 – Product Requirements.

1.03 SHOP DRAWINGS

A. Present information required on Shop Drawings in a clear and thorough manner. Identify details by reference to drawing and detail, schedule, or room numbers shown and specified.

1.04 PRODUCT DATA

A. Clearly mark each copy to identify pertinent products or models. Show performance characteristics and capacities, dimensions and clearances required, wiring or piping diagrams and controls.

B. Modify manufacturer's standard schematic drawings and diagrams to delete information which is not applicable to the Work.

C. Supplement standard information to provide information specifically applicable to the Work.

1.05 SAMPLES

A. Samples shall be of sufficient size and quality to clearly illustrate functional characteristics of product, with integrally related parts and attachment devices.

B. Submit full range of colors, textures, and patterns.
1.06 CONTRACTOR’S RESPONSIBILITIES

A. Review, mark up as appropriate, and stamp Shop Drawings, Product Data, and Samples prior to submission.

B. Determine and verify field measurements, field construction criteria, catalog numbers and similar data, and conformance with requirements of Contract Documents.

C. Coordinate each submittal with requirements of the Work and of the Contract Documents.

D. Notify Architect in writing, at time of submission, of any deviation in submittals from requirements of Contract Documents.

E. Begin no fabrication or Work which requires submittals until return of Architect's final reviewed submittals.

1.07 SUBMISSION REQUIREMENTS

A. Make submittals promptly in accordance with approved schedule and in such a manner as to cause no delay in the Work.

B. Number of Submittals Required:
   1. Shop Drawings: Submit one reproducible transparency, which will be returned for reproduction and distribution by the Contractor, and two opaque reproductions which will be used for checking and will not be returned. Resubmit as required until final action by the Architect.
   2. Product Data, and Non-Reproducible Submittals: Submit the number of copies which the Contractor requires, plus two which will be retained by the Architect.
   3. Samples: Submit number stated in each Section.

C. Submittals shall Contain:
   1. Date of submission and dates of any previous submissions with identification of revisions on any re-submittals.
   2. Project title and number; Contract identification; names of Contractor, supplier, and manufacturer.
   3. Relation to adjacent or critical features of the Work or materials.
   4. Applicable Standards, such as ASTM or Federal Specification numbers.

1.08 SUBMITTAL SCHEDULE

A. Time of submission of Shop Drawings, Product Data, and Samples by the Contractor and their processing and return by the Architect, is a matter which must be jointly agreed to by both parties in order that items covered by required submittals will be available when needed by the construction process and so that each party can plan their workload in an orderly manner.

B. The Contractor shall prepare a Submittal Schedule in the format provided, coordinated with the Progress Schedule, and submit to the Architect 15 calendar days prior to submission of the first submittals or simultaneously with the Progress
Schedule, whichever is earlier. No submittals will be processed before the Submittal Schedule has been reviewed by the Architect.

1. Sample Submittal Schedule Form attached to end of this Section.

C. In preparing the Submittal Schedule, the Contractor shall first determine, from the Progress Schedule, the date the particular item is needed on the Work for installation. Working backwards, the Contractor will then add the number of days for shipment, time for fabrication, and similar items, to determine the date of first submittal. Note that the Architect will determine the time required in steps 5 and 8 of the form. To secure this, the Contractor shall furnish the Architect with draft copies of the Submittal Schedule with all information in steps 1, 2, and 3 completed.

D. The intent is to adjust the Schedule to produce an orderly, even workload, without peak loads if possible, and yet meet the needs of the construction process. After the schedule is completed by the Contractor, the Contractor shall, at its expense, furnish copies to the Architect as required.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
## SUBMITTAL SCHEDULE (SAMPLE)

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### STEP LEGEND

- Date this step is scheduled to be completed
- Date this step is actually completed
- Calendar days required to complete this step (if applicable)

05/31/19
CITY OF KIRKLAND
JUANITA BEACH PARK BATHHOUSE

SECTION 01 41 00

REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 APPLICABLE CODES AND STANDARDS

A. Any specific reference in the Specifications to codes, regulations, reference standards, manufacturer's instructions or requirements of regulatory agencies shall mean the latest printed edition of each in effect at the date of submission of bids unless the document is shown dated.

B. Perform the Work in conformance with the applicable requirements of all regulatory agencies including, but not limited to, the following:
   7. ANSI 117.1 Disability Standards.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

05/31/19
SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 ABBREVIATIONS

A. The following abbreviations of organizations may be used in the Contract Documents.

1. AAMA Architectural Aluminum Manufacturer's Association
2. ACI American Concrete Institute
3. AGC Associated General Contractors of America
4. AI AIA American Institute of Architects
5. AISC American Institute of Steel Construction
6. AITC American Institute of Timber Construction
7. ANSI American National Standards Institute
8. APA American Plywood Association
9. ASTM American Society for Testing and Materials
10. AWPA American Wood Preservers Association
11. AWS American Welding Society
12. AWI Architectural Woodwork Institute
13. BHMA Builder's Hardware Manufacturers Association
14. CLFMI Chain Link Fence Manufacturers Institute
15. CRSI Concrete Reinforcing Steel Institute
16. CS U.S. Commercial Standard
17. DHI Door and Hardware Institute
18. FGMA Flat Glass Marketing Association
19. FM Factory Mutual System
20. FS Federal Specification
21. GA Gypsum Association
22. MLSFA Metal Lath/Steel Framing Association
23. NAAMM National Association of Architectural Metal Manufacturers
24. NEC National Electrical Code
25. NEMA National Electrical Manufacturers Association
26. NFPA National Fire Protection Association; National Forest Products Association
27. NWMA National Woodwork Manufacturers' Association
28. NWWDA National Wood Window and Door Association
29. PCI Prestressed Concrete Institute
30. PDCA Painting and Decorating Contractors of America
31. PS U.S. Product Standard
32. SDI Steel Deck Institute; Steel Door Institute

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REFERENCES

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SMACNA  Sheet Metal and Air Conditioning Contractors National Association, Inc.
SSPC    Steel Structures Painting Council
TCA     Tile Council of America
TPI     Truss Plate Institute
UBC     Uniform Building Code
UL      Underwriters' Laboratories, Inc.
UMC     Uniform Mechanical Code
UPC     Uniform Plumbing Code
WABO    Washington Association of Building Officials
WAC     Washington Administrative Code
WSDOT   Washington State Department of Transportation
WWPA    Western Wood Products Association

Additional abbreviations, used only on the Drawings, are listed thereon.

1.03 SYMBOLS

A. Symbols, used only on the Drawings, are shown thereon.

1.04 DEFINITIONS

A. Terms used on the Drawings or in the Specifications in addition to those shown in General Conditions shall have the meanings as follows. Terminology is shown to the left, its meaning is shown to the right.

B. As Directed "By the Architect"

C. As Required "By Code; by good building practice; by the condition prevailing; by Contract Documents; by Owner, or by Architect"

D. As Selected "By Architect"

E. Equal/Equivalent In the opinion of the Architect. The burden of proof of equality is the responsibility of the Contractor.

F. Furnish "Supply and deliver to the Project ready for installation and in operable condition."

G. Install "Incorporate in the Work in final position, complete, anchored, connected, and in operable condition."

H. NIC Not in Contract

I. Owner City of Kirkland

J. Project Total construction of which Work performed under the Contract Documents may be the whole or a part.

K. Provide "Furnish and install complete." When neither "furnish", "install", nor "provide" is stated, "provide" is implied.
REFERENCES

L. Shown "As indicated on the Drawings"
M. Specified "As written in the Project Manual/Specifications"

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 TESTING LABORATORY SERVICES

A. Testing Laboratory: Owner will retain and pay expenses of a Testing Laboratory, except as specified otherwise in the individual Sections, as an independent testing laboratory to perform, and report on, the tests and inspections described in the Specifications or as otherwise deemed necessary and appropriate.

B. Additional Testing and Inspection: If initial tests or inspections made by the Testing Laboratory reveal that materials do not comply with Contract Documents, or if Architect has reasonable doubt that materials comply with Contract Documents, additional test and inspections shall be made as directed.
   1. If additional tests and inspections establish that materials comply with Contract Documents, all costs for such tests and inspections shall be paid by Owner.
   2. If additional tests and inspections establish that materials do not comply with Contract Documents, all costs of such tests and inspections shall be deducted from the Contract Sum.

1.03 SPECIAL INSPECTIONS

A. All special inspections shall be performed by Washington Association of Building Officials (WABO) registered special inspectors and their employer agencies.

B. Inspections and Tests: Perform, on site, at fabricators’ plants, or in approved professional testing laboratory.


D. Duties of Special Inspector: Make required tests in accordance with regulatory requirements. Submit written reports to Owner and Architect. Submit test reports as soon as they are made. Submit inspection reports. Special Inspector shall have access to the Work at all times. The Contractor shall furnish facilities for such access in order that the Special Inspector may properly perform his functions.

E. Notices: Notify Architect and Special Inspector at least 48 hours before Work requiring inspection is started.
F. Costs: Fees for special inspection and testing will be paid by the Owner. Additional inspection and tests required because of defective Work or ill-timed notices shall be paid by the Contractor. Additional inspection or testing performed at Contractor's request shall be the sole responsibility of the Contractor.

1.04 TESTS, INSPECTIONS, AND METHODS REQUIRED

A. Items for Special Inspection and Testing: Inspection and tests shall be performed as required to assure compliance with Drawings and Specifications and as noted on the Structural and Civil Drawings. Inspections and tests may include but not necessarily be limited to the following:

1. Concrete: During taking of test specimens and placement of reinforced concrete greater than 2500 psi compressive strength.
2. Bolts Installed in Concrete: Prior to and during placement of concrete around bolts when stress increases permitted by UBC Section 1923, Table 19-D, Footnote 5, are used.
3. Reinforcing Steel: During placement of reinforcing steel for all concrete required to have special inspection as specified in 1.4, A,1.
4. During welding of any structural member or connection designed to resist loads and forces required by code.
5. High Strength Bolting: As required by IBC Chapter 22.
6. Special Grading, Excavating, Filling, and Structural Fills: When buildings are supported by fill materials, special inspections will be required to verify each soil lift meets minimum compaction requirements. Provide sufficient observation during preparation of natural ground and placement and compaction of fill to verify that Work is performed in accordance with Drawings, Specifications, and Geotechnical Report.

B. Other Special Inspections: Special inspections required for other elements not specifically listed when, in the opinion of the building official, the Work is such that compliance is difficult to demonstrate without special inspection.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements for the Contractor's construction facilities and temporary controls.

1.03 DESCRIPTION

A. This Section specifies minimum actions required. Other actions may be specified elsewhere in the Contract Documents, manufacturer's literature, and governing regulations.

B. Nothing in this Section is intended to limit types or amounts of construction facilities and temporary controls.

C. No omission from this Section will be recognized as a temporary activity that is not required to complete the Work.

1.04 DISPOSAL OF WASTE MATERIALS

A. See Section 01 74 19 Construction Waste Management and Disposal.

B. Dispose of all refuse and waste material, including excess earth from excavation, off Owner's property in a legal manner conforming to all requirements of local authorities having jurisdiction. Do not stockpile waste material on Owner's property. Immediately clean up any spilled material.

C. Clean all trash and debris from work area daily. Keep work area, site, and adjacent properties free from accumulations of waste materials, rubbish and windblown debris resulting from construction operations.

D. Provide on-site containers for collection of waste materials, debris and rubbish. Periodically remove waste from the site. Do not use Owner's waste containers for construction waste.

E. Waste Construction Liquid Disposal: Provide portable containers for disposal of any waste construction liquids or fluids that are generated by or needed for the construction work. Do not dump any waste construction liquid or fluid (including paint, solvents, plaster mud, brush and tool cleanup water, etc.) down the building.
sanitary or storm drain systems or anywhere on the site (except clean water). Dispose of contents of all portable containers off site daily.

F. Dispose of all flammable, hazardous, and toxic waste materials daily. Storage of these materials will not be permitted on the interior of building.

G. Locate dumpster within the fenced Work Area.
   1. Dumpsters shall have a hinged lid that shall be closed and locked at the end of each day’s work.

1.05 TEMPORARY ELECTRICITY

A. The Contractor shall provide electrical power, including temporary power service or electrical generator(s) required to complete the work of this Contract. The Contractor will provide for all connection costs including but not limited to fees, meters, transformers, disconnects, cabling, etc. and shall remove temporary connections after Work is completed.

B. Provide temporary electric feeders from electrical service. Power consumption shall not disrupt Owner’s need for continuous service. Verify type of service characteristics and provide temporary feeders accordingly.

C. Provide power outlets for construction operations, with branch wiring and distribution boxes. Provide OSHA/WISHA approved flexible power cords as needed.

D. Provide temporary service disconnect and over current protection at convenient location.

E. Permanent convenience receptacles may be utilized during construction provided they are replaced if damaged or defaced in any way.

1.06 TEMPORARY LIGHTING

A. Provide and maintain lighting for construction operations. Provide sufficient lighting to ensure proper workmanship everywhere.

B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as needed.

C. Maintain lighting and provide routine repairs.

D. Superintendent shall carry a digital/voice pager or a cellular phone to allow voice communication at all times.

1.07 TEMPORARY WATER SERVICE

A. Provide, maintain, and pay for suitable quality water service required for construction operations. Pay all costs of connection and piping required to perform the work.
B. Extend branch piping with outlets located so water is available by hoses with threaded connections.

1.08 **TEMPORARY SANITARY FACILITIES**

A. Provide and maintain temporary OSHA/WISHA required portable toilet facilities and enclosures; in sufficient numbers and locations to accommodate the size of workers on site. Maintain daily in clean and sanitary condition.

1.09 **TEMPORARY HEAT**

A. Provide and pay for temporary heat devices and energy source as required to maintain conditions required for construction operations.
   1. Use of the permanent heating system in the buildings is not permitted.
   2. Direct fired gas/oil heaters are not allowed, all combustion/exhaust gases shall be vented to building exterior.

B. Maintain minimum ambient temperature of 60 degrees F in areas where construction is in progress, unless required otherwise by manufacturers, trade associations, and/or the specification sections.

1.10 **TEMPORARY VENTILATION**

A. Provide temporary ventilation equipment to facilitate drying out of materials, to dissipate humidity, to maintain consistent temperature in all areas and to prevent accumulation of dust, fumes, vapors, or gases.

1.11 **TEMPORARY DEHUMIDIFICATION**

A. Provide temporary dehumidification equipment as required to lower the moisture content of the building interior and dry out materials to required levels.

1.12 **BUILDING MATERIALS ACCLIMATIZATION AND DRY OUT**

A. Prior to installation of any building insulation, wall surfaces or finishes, the Contractor shall provide the equipment and expertise required to dry out the building structure and materials, including concrete slabs, to conform with the following minimum criteria:
   1. Contractor is responsible for selecting the means and methods utilized to acclimate, ventilate and dry out the building structure and materials, including concrete slabs, by selecting proper sequence of construction and other determinates affecting the dry out process; and shall hire an expert consultant to advise in this process if problems or questions are encountered.
   2. Acclimate, ventilate and dry out structure and materials as required by manufacturers of materials, finishes or coverings applied over, onto or within the structure or material.
      a. Refer to Section 03 30 02 for requirements related to concrete floor slabs.
   3. Acclimate, ventilate and dry out structure and materials as required to allow installed materials to dry evenly and rapidly as recommended by manufacturer or reference standard.
4. Acclimate, ventilate and dry out structure and materials as required to prevent the formation of water condensation on any material.

5. Do not install thermal insulation until the moisture content and temperature of building materials is being maintained at a level that will prevent condensation from forming in the insulation or on the cold side surface of the insulated cavity.

6. Test and record moisture content of each different building structural element and material on a daily basis during and after acclimatization and dry out process.
   a. Provide professional quality moisture testing equipment capable of providing consistently accurate moisture content analysis for each different type of material found on project.
   b. Record moisture content data collected on a printed log showing location of each test and material/structural member tested; key each test to a floor plan.
   c. Provide copies of the moisture log and keyed floor plan to subcontractors suppliers, Architect and Owner upon request.

7. The Owner may elect to hire a testing lab to perform the moisture testing and recording at the Contractor’s expense if the Contractor fails to provide adequate or consistent moisture content testing and recording as specified herein.

1.13 TEMPORARY BARRIERS

A. Provide barriers to protect the public from any potentially unsafe conditions, and from damage and/or dust from construction operations.

B. Provide protection for existing plant life designated to remain. Replace damaged plant life.

C. Protect non-owned vehicular traffic, stored materials, site and structures from damage.

1.14 TEMPORARY CONSTRUCTION SITE FENCING

A. Commercial grade chain link fencing.

B. Provide 6 foot high temporary chain link fence around the construction area; equip with vehicular and pedestrian gates with locks.
   1. Anchor each fence post securely as required to maintain integrity of security fencing.

1.15 WATER CONTROL

A. See Section 01 57 13 – Temporary Erosion and Sediment Control for additional site dewatering.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water.
D. Provide settling basins and erosion control.

E. Protect any facilities on-site and off-site from damage due to uncontrolled water.

1.16 TEMPORARY STORAGE

A. The Contractor shall make whatever provisions necessary to ensure the safe and weather-tight protection of materials, or equipment temporarily stored.

1.17 EXTERIOR ENCLOSURES

A. After roof is installed and insulation or interior finishes are started, provide temporary, weather-tight enclosure over any portion of the building exposed to the weather to prevent the structure and finishes from getting wet.

1.18 PROTECTION OF INSTALLED WORK

A. Protect installed work. Provide special protection where specified in individual specification sections or as required to prevent any type of damage or defacement.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to minimize damage.

C. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer and install protection. Remove and replace waterproofing or roofing material damaged during the work.

D. Prohibit construction worker access to all rooms and areas which do not have construction work. After work in any area or room is complete, prohibit further worker access.

E. Prevent any construction dust and dirt from entering the HVAC equipment and ductwork, computer equipment, electrical switchgear, building systems/equipment, smoke detectors or anything that will be adversely affected.

1.19 SECURITY

A. Lock up or block up all doors, windows and openings in building and lock any gates on the site each day prior to leaving the site to prevent unauthorized entry into the building or site.

B. Maintain building security until the Owner takes permanent occupancy or until substantial completion is achieved, whichever occurs first.

1.20 ACCESS ROADS

A. Provide and maintain access to fire hydrants, free of obstructions. Do not block access roads or prevent emergency vehicles access to site.

1.21 PROGRESS CLEANING

05/31/19
A. Provide periodic cleaning to prevent any buildup or accumulation of construction debris and dirt on the site.

B. Maintain areas free of waste materials, debris, rubbish and dust. Maintain site in a clean and orderly condition.

C. Remove waste materials, debris, and rubbish from site weekly and dispose off-site.

1.22 ENVIRONMENTAL PROCEDURES

A. Comply with all environmental and health safety regulations.

B. Burning on site is not permitted.

1.23 FIELD OFFICE

A. Office: Weather-tight, with lighting, electrical outlets, HVAC equipment, and equipped with sturdy furniture, plan rack and drawing display table.

B. Provide office large enough to comfortably house Superintendent and the Field Engineer, and to accommodate weekly jobsite meetings, with table and chairs adequate for all attendees up to a maximum of ten (10) people.

C. Provide copy and fax machine on site for use of Contractor, Architect and Owner.

D. Provide computer(s) with Microsoft Word, Excel, and Adobe Acrobat software programs and internet connection for e-mail communication with Superintendent and Field Engineer.

E. Maintain office in organized and clean condition.

1.24 MACHINERY AND EQUIPMENT RESTRICTIONS

A. Equipment and Internal Combustion Engine Noise: The noise level of each vehicle or piece of equipment shall not be greater than 90 DB(A) at a distance of 50 feet as measured under noisiest operating conditions. Mufflers for stationary engines shall be hospital-area quality of silencing.

1.25 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary above grade or buried utilities, equipment, facilities, materials,

B. Remove temporary underground installations to a minimum depth of 2 feet.

C. Clean and repair damage caused by installation or use of temporary work.

1.26 EMERGENCY CONTACTS

A. Provide Owner with two emergency contact names (Superintendent and Project Manager), with home phone, cell phone and pager numbers.

05/31/19
PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION
SECTION 01 50 10

TEMPORARY PROJECT SIGN

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SUMMARY

A. Supply the following types of signs as indicated by the Architect and conform to the specifications given herein.

B. Construction/Job Signage must comply with the requirements of the ARRA, the Authorities Having Jurisdiction, and the requirements of the Architect.

C. Prohibitions: The following may not be used by the Contractor on the site:
   1. Separate Contractor's, subcontractor's or supplier's signs or advertisements.
   2. Signs that flash, blink, rotate or otherwise draw unusual attention (except where required by safety regulations).
   3. Company or agency logos.

PART 2 - PRODUCTS

2.01 MATERIALS

A. All project signs and construction signs shall be fabricated from the following materials:
   1. Plywood Face: High density overlay type, with overlay 0.012” thick each side, 45% resin content by dry weight, and minimum weight of 60 pounds/thousand sq. ft. of surface. 3/4” nominal plywood thickness shall be provided.
   2. Paint: Exterior, gloss, alkyd enamel. Provide 2 coats on all sign faces, backs and edges and 1 coat on all posts.
   4. Wood Posts: Douglas Fir, S4S, with design stress of 1400 psi fb minimum. Paint the entire post before embedding in earth. Provide posts in sizes and depths of embedment as indicated. All signs will be reviewed with the Architect for location and nature of mounting details.

2.02 SIGNS

A. The Contractor shall provide the “Project Sign".
1. Layout and design are provided in this specification
2. Area of plywood shall be 4 feet x 8 feet.

B. The Contractor shall provide all required signs and postings of all Authorities Having Jurisdiction.

PART 3 - EXECUTION

3.01 FABRICATION AND INSTALLATION

A. All project signs and construction signs shall conform to the following:
1. Sign Panel: All cuts and edges shall be square and clean and all defects patched before painting.
2. Image: Symbol or type may be screened or hand painted. No screen patterning, paint build-up, bleed-through or drips and runs will be allowed. Hand-made patterns must be carefully cut and true to the symbols provided therein. Only clear, crisp sign painting is acceptable. Hand-painted graphics shall be true to the design.
3. Posts: All signposts shall be embedded in earth and braced. All signs 4’ x 8’ and larger shall have compacted gravel around each post.

END OF SECTION
SECTION 01 56 39
TREE, PLANT, AND SOIL PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes general protection and pruning of existing trees, plants and soils that are affected by execution of the Work, whether temporary or permanent construction.

1. Protection and care for existing trees to be preserved;
2. Relocation/expansion of existing tree protection fencing previously installed on site;
3. Installation and maintenance of tree protection fencing;
4. Identification of branches and major limbs of trees to be preserved that need to be pruned for construction clearance and/or other reason;
5. Pruning and maintenance of trees to be preserved per direction from Contractor’s Arborist;
6. Prevention of the use of motorized and heavy equipment within CRZ and storage within the CRZ;
7. Controlling surface runoff and erosion; and
8. Coordination with the Temporary Erosion and Sedimentation Control (TESC) plan.

B. See Section 02 41 13 for plant salvage specifications.

1.2 PURPOSE

A. Existing trees are a critical element of the environment. Mature trees provide a greater amount of biomass than newly planted trees, contributing to shading of pavements and improving air and water quality. Large trees are part of a site’s history and character. Protection, care and maintenance is required as part of construction activities and permit requirements of this Project.

1.3 RELATED SECTIONS

A. Coordinate with related Work specified in other parts of the Project Manual.

B. Coordinate with the General Conditions and Supplemental Conditions in the Contract.

1.4 REFERENCES, ABBREVIATIONS AND DEFINITIONS

A. Reference the following standards:
   ISA International Society of Arboriculture

B. Diameter at breast height (DBH); diameter of a trunk as measured at a height 54 inches above the ground line.
C. Critical Root Zone (CRZ): The critical root zone is an area for an individual tree and is defined per the Contract Documents.

D. Tree Care and Maintenance: Providing a provision for and the “act” of maintaining a trees condition and or restoring a tree from a stressed condition.

E. Tree, Vegetation and Soil Protection Plan (TVSPP): The TVSPP is a document prepared by the Contractor’s Arborist which describes the manner in which approved work within the CRZ of trees to be preserved is to be performed. The TVSPP also summarizes AHJ requirements as well as describes and outlines tree maintenance procedures to be followed during the term of this Contract.

F. Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected with fencing during construction and as indicated on Drawings. Zone to be documented on TVSPP. Following completion of work, protection fence shall be moved out to the CRZ or dripline, whichever is greater, or as directed by the Owner’s Arborist.

G. Plant Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected with fencing during construction and as indicated on Drawings. If area is not denoted, protect landscape area to edge of pavement, dripline or lawn edge.

H. Protection Zone: Area protected by fencing that includes tree protection zone, plant protection zone areas and soil protection areas.

I. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.5 PREINSTALLATION CONFERENCE

A. Preinstallation Conference: Conduct conference a minimum of 10 days before work begins with Owner, Contractor, Owner’s Arborist and Contractor’s Arborist. Meeting shall not be scheduled until Contractor has obtained approval of submittals noted in this section.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

   a. Tree-service firm’s personnel and equipment needed to make progress and avoid delays.
   b. Contractor’s and Owner’s Arborist responsibilities.
   c. Quality-control program.
   d. Coordination of Work and equipment movement with the locations of protection zones.
   e. Trenching by hand or with air spade within protection zones.
   f. Field quality control.
1.6 QUALITY ASSURANCE

A. Contractor’s Arborist Qualifications: Certified Arborist as certified by ISA and specialize in the Work of this Section and have a minimum 5 years documented experience in tree protection, tree care and tree maintenance on construction sites.

B. Tree Service Firm Qualifications: An experienced tree service firm with a minimum of 3 years of documented experience that has successfully completed temporary tree and plant protection work similar to that required for this Project. All work to be overseen by the Contractor’s Arborist.

C. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include the Contractor’s Arborist’s and tree-service firm’s responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.7 SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of the following:

1. Mulch: 1-gallon volume of mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
2. Protection Zone Fencing: Cut Sheet.
3. Protection Zone Signage:
   a. Full-size Samples of each size and text, ready for installation.
   b. Description of content of each sign.

C. Tree, Vegetation and Soil Protection Plan (TVSPP):

1. Include Contract Documents and locations of protection fencing and signage.
2. Indicate extent of trenching by hand or with air spade within protection zones.
3. Include watering, care and maintenance methods and schedule
4. Plan shall address project work areas which are inside and adjacent to project limits. Include staging, access, laydown, storage areas and areas that will remain undisturbed.

D. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include tree tag number per the existing tree summary table for each tree.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance pruning.
E. Qualification Data: For Contractor’s Arborist and tree service firm.

F. Contractor Arborist Reports

1. Certification: From Contractor’s Arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards. Indicate if any trees were damaged, and if trees were promptly and properly treated and repaired when damaged and describe other issues that may have occurred.

2. Maintenance Recommendations: From Contractor’s Arborist, for care and protection of trees affected by construction or showing signs of stress during and after completing the Work.

G. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or video recordings.
2. Include Contract Documents and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.8 FIELD CONDITIONS

A. The following practices are prohibited within CRZ:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Erection of sheds or structures.
4. Impoundment of water.
5. Non-manual excavation unless otherwise indicated.
6. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 SOIL

A. Backfill Soil: Stockpiled soils reviewed by Arborist, per Section 31 00 00 - Earthwork.

2.2 ARBORIST WOODCHIP MULCH (MULCH)

A. Tree Protection Mulch: Shall be Arborist Wood Chip mulch as described in Section 32 93 00 – Landscape Planting.
2.3 FENCING

A. Protection Zone Fencing: Fencing shall meet the following requirements for noted application:

1. Chain-Link Protection Zone Fencing for Tree Protection Zone:

   a. Galvanized-steel fencing fabricated from minimum 2-inch opening, 0.148-inch-diameter wire chain-link fabric; with pipe posts, minimum 2-3/8-inch-OD line posts, and 2-7/8-inch-OD corner and pull posts; with 1-5/8-inch-OD top and bottom rails; with tie wires, hog ring ties, and other accessories for a complete fence system.

      1) Height: 72 inches.
      2) Concrete pier blocks to have a minimum weight of 75 pounds.
      3) Pier Block Anchors: #4 rebar
      4) Chain link fence panel clamp: galvanized steel
      5) Otherwise approved modular steel construction fencing.

2. Plastic Protection Zone Fencing for Plant Protection Zone:

   a. Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with nylon zip ties or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts, 2-inch by 2-inch wood posts or rebar with protective caps, spaced not more than 48 inches apart.

      1) Height: 48 inches.
      2) Color: High-visibility orange, non-fading.

B. Protection zone fencing for soil protection shall consist of chain-link fencing when associated with tree protection and plastic protection fencing when associated with plant, lawn or topsoil protection.

2.4 SIGNAGE

A. Tree Protection Zone Signage

1. Protect Tree Value Signage: Shop-fabricated, rigid plastic, metal sheet, or other material that is weather resistant for at least one year with attachment holes pre-punched and reinforced; legibly printed with non-fading lettering and as follows:

   a. Lettering: 3-inch-high minimum
   b. Sign Size: approximately 14 inches by 20 inches
   c. Each sign to read: “Protect Tree”
2.5 TREE ROOT PROTECTION FABRIC

A. GEOCOIR DeKoWe 400 fabric or approved equal

2.6 TREE WATERING SYSTEM

A. Provide water barrels as shown on the Contract Documents and Contract Documents or per TVSPP. Water barrels are to be sized based on the estimated volume of water required to water the preserved tree a minimum amount of water equal to 1 inch of precipitation over the entire CRZ once per week from May through September. Design and implement the water dispersion system to cover the entire landscape areas in the CRZ areas for complete saturation. Watering system must be approved by Owner as part of the TVSPP and before installation. An alternate watering system may be submitted for consideration and written approval.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion and sedimentation control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Prepare written report, endorsed by Contractor's Arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

A. Protection installed prior to demolition, earthwork or trenching.

B. Locate and clearly identify trees, shrubs, and other vegetation to remain or to be relocated. Tie a 1-inch to 2-inch wide blue plastic tape around each tree trunk at 54 inches above the ground and securely around shrubs and other vegetation to remain. Review trees with Owner.

C. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

D. Tree Protection Zones: Mulch areas inside tree-protection zones and other areas indicated. Do not exceed indicated thickness of mulch.

1. If area is to remain lawn, do not apply mulch.
2. Prior to placing mulch, apply tree root protection fabric.
3. Apply 4-inch thickness of organic mulch unless otherwise indicated. Do not place protection fabric or mulch within 2-feet of tree trunks.
3.3 PROTECTION ZONES

A. Tree Protection Zone Fencing: Install protection zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe 4-foot minimum clear passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Chain-Link Fencing: Install to comply with ASTM F 567 and with manufacturer's written instructions.
2. Posts:
   a. Set posts into concrete pier blocks. Secure every other pier block with rebar bent over block with both ends embedded per plan into the ground.
   b. If existing topography or features (stairs, walls, rockeries) prevents use of concrete pier blocks, fence posts can be driven into the ground as directed by Contractor’s Arborist. Set or drive posts into ground one-third the total height of the fence within landscape areas.

3. Access Point: Install one access point per fence; adjust to open smoothly, easily, and quietly. Each access point to be secured with chain link fence panel clamp.
4. Attach 1-inch to 2-inch wide orange plastic tape strips 12 inches long at 3-feet on-center spacing along the tree protection zone fence, 5-feet above grade.
5. An alternate fence type may be submitted for consideration and written approval.

B. Plant Protection Zone Fencing: Install plant protection zone fencing along edges of plant and soil protection zones in a manner that will prevent people and animals from easily entering protected areas before materials or equipment are brought on the site and construction operations begin. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Take care not to damage existing plants or compact existing soil when installing fencing. Install posts a minimum of 1-foot deep at approximately 4-feet on center, attach fence fabric to posts a minimum of 3 places. Stretch fabric uniformly between posts.
2. Fencing is not required where vegetation is protected by an existing fence or tree protection zone fencing.

C. Tree Protection Zone Signage: Install signage in visibly prominent locations in a manner approved by Owner. Install one sign spaced approximately every 25 feet on protection zone fencing, but no fewer than two signs with each facing a different direction for each tree.

D. Maintain protection zones free of weeds and trash.

E. Maintain protection zone fencing and signage in good condition as acceptable to Owner.

9/30/19
1. Do not remove protection zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by Owner’s Arborist if a root buffer effective against soil compaction is installed as directed by Contractor’s Arborist. Maintain root buffer so long as access is permitted.

F. Protect and maintain vegetation that protects soil areas to remain. Protected soil areas are indicated as undisturbed on Contract Documents.

3.4 ROOT PRUNING

A. Root Pruning within CRZ: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

B. Prune tree roots that are affected by temporary and permanent construction. Prune roots as directed by Contractor’s Arborist at a minimum:
   1. Notify Owner and Arborist when roots greater than 2” shall be required to be cut from trees in the right of way.
   2. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
   4. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
   5. Cover exposed roots with burlap and water regularly.
   6. Backfill as soon as possible according to requirements in Section 31 00 00 "Earthwork."

3.5 EXCAVATION

A. General:
   1. Excavate at edge of protection zones according to requirements in Section 31 00 00 "Earthwork" unless otherwise indicated.
   2. Excavation within CRZ to be under the supervision of the Contractor’s Arborist.

B. Trenching within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots less than two-inches that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction
and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.6 REGRADING WITHIN CRZ

A. Lowering or raising grades greater than 1 inches within the CRZ shall be under the supervision of the Contractor’s Arborist.

1. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the CRZ. Maintain existing grades within the CRZ.

2. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the CRZ. Maintain existing grades within the CRZ.

B. Root Pruning: Prune small (under 2-inch) tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the CRZ. Maintain existing grades within the CRZ.

3.7 FIELD QUALITY CONTROL

A. Inspections: The Contractor’s Arborist shall direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare a minimum of 2 inspection reports each year.

3.8 MAINTENANCE

A. Water trees according to the approved watering schedule as documented within the TVSPP. Submit completed watering schedules to the Owner monthly. Ensure that water barrels or other approved water-holding tanks that are used to water trees are sufficiently above grade of trees to be preserved for adequate gravity flow of watering system. The Contractor’s Arborist may increase the required amount of water where significant portions of the CRZ are disturbed from approved construction activities.

B. Re-apply mulch where deficient to retain 4–inch depth. Maintain existing grass and landscaping within the protection zone if specified to remain.

C. Remove weeds within the dripline of the CRZ by hand, a minimum of once a month to prevent weed overgrowth during the course of construction. If weeding within the CRZ is not being completed the Owner may at its discretion contract the work to be performed and deduct via Change Order the invoiced amount from the Contract.

D. Mow lawn a minimum of twice a month during growing season.

9/30/19
3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs indicated to remain or to be transplanted that are damaged by construction operations, in a manner approved by Owner.

1. Submit Contract Documents of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours according to Contractor's Arborist written instructions.
3. Replace shrubs and other plants that cannot be repaired and restored to full-growth status, as determined by Owner. See below for tree repair and replacement.

B. Impacted Trees: Remove trees indicated to remain that are more than 35 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Owner determines are incapable of restoring to normal growth pattern. Provide the following compensation:

1. Replacement Tree:
   a. Replacement tree to be located at location of impacted tree.
   b. Species: Equivalent or as selected by Owner.
   c. Size: 4 to 6-inch caliper.
2. Plant and maintain new trees per Section 32 93 00 "Plants"
3. Provide compensation to the Owner per Arborist's calculated tree value per ISA plus an administrative value of $10,000 per tree.

C. Soil Aeration: Where directed by Owner and Arborist, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 4 feet to tree trunk. Drill 2-inch- diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash, and debris and legally dispose of them off Owner's property.

3.11 COMPLETION

A. Maintain tree and vegetation protection until removal is approved or directed by Owner.

B. Provide Owner and the Owner's landscape management company with a report prepared by Contractor’s Arborist outlining the condition of preserved trees, including a complete description of special maintenance required by any tree preserved as part of this project.

END OF SECTION
SECTION 01 57 13
TEMPORARY EROSION SEDIMENT CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Work includes, but is not limited to:

1. Temporary Erosion and Sediment Control (TESC) measures, which are shown on the Contract Documents, proposed by the Contractor and reviewed by public Authorities Having Jurisdiction (AHJ) and ordered by AHJ during the life of the Contract. This Work is intended to prevent, control and provide abatement for water pollution and erosion resulting from the Project site construction and to minimize damage to the Work, adjacent property, and to other bodies of water in accordance with City of Kirkland (COK), the standards of the King County Surface Water Design Manual, 2016 and associated COK Amendment.

2. Preparation of and submission to COK for their review the Contractor’s Construction Stormwater Pollution Prevention Plan (CSWPP). The CSWPP shall include overall Erosion and Sediment Control (ESC) measures and Stormwater Pollution Prevention Control (SWPPS) measures.

3. Submittal of wet weather permit, dewatering permits and other permits related to Contractor operations shall also be included.

4. Protection of public and private drainage systems.

5. Protection of existing natural and constructed drainage systems at all times.

6. Provide chitosan enhanced sand filtration with portable storage and filtration tanks and pumps to meet point of compliance or AHJ approved equivalent approach for ESC flow control and sediment discharge.

7. Provide temporary pumps and force mains to convey water as necessary on site to portable treatment facilities.

8. Testing, monitoring and reporting of discharge per AHJ permit requirements, at designated points or otherwise approved by AHJ.

B. It shall be the Contractor’s responsibility to modify the ESC plan(s) as necessary to meet the Contractor’s anticipated construction sequencing and means and methods for the Work. Modifications to the ESC Plans and specifications need to be adequately described in the Contractor’s CSWPP and submitted to AHJ for review.

1.2 REFERENCES

A. Reference the following standards:

AHJ Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited COK, King County, and the Ecology

COK City of Kirkland Standard Plans

9/30/19
1.3 SUBMITTALS

A. Submit the following documents in accordance with Division 01 of the Specifications.

1. Prepare, provide and submit to the City of Kirkland a Construction Stormwater Pollution and Prevention Plan (CSWPP) signed by the Contractor describing TESC controls, locations, phasing, implementation schedule, contingency measures, inspection procedures, maintenance, monitoring, recordkeeping forms, and similar information, sequencing approach to TESC removal and similar information to fully describe the TESC plan. The Contractor shall revise and resubmit CSWPP to address comments from COK.

   a. Construction Stormwater Pollution Prevention Plan (CSWPP) in accordance with the KCSWDM and COK Addendum Plan

B. Permits

1. Obtain the permits, pay fees and schedule inspections by AHJ as needed for work in this Section.

2. Contractor to prepare application, submit and obtain approval from Washington State Department of Ecology NPDES Stormwater Discharge Permit for Construction.

3. Submit copy of approved NPDES permit and other permits obtained

C. Certified Erosion and Sediment Control Lead (CESCL)
1. The Certified Erosion and Sediment Control Lead (CESCL) shall be responsible for implementing and maintaining effective ESC to prevent violations of the AHJ permits. The designated lead shall be:
   b. Identified by the designee’s certification in the CSWPP submittal.
   c. Experienced with a minimum of three projects of similar nature listed on the resume identifying project name and location, year constructed, owner, contact name and phone number.

2. The CESCL Back-up shall be responsible for implementing and maintaining effective ESC to prevent violations of the AHJ Permits. The backup shall have:
   b. Identified by the designee’s certification in the CSWPP submittal.
   c. Experienced with a minimum of one project of similar nature listed on the resume identifying project name and location, owner, contact name and phone number.

D. WATER QUALITY SAMPLING AND MONITORING PLAN

1. Submit Monitoring Plan for turbidity and pH sampling of stormwater in public storm drain system upstream and downstream from the Project site or other approved point and at the outlet of the chitosan-enhanced sand filter system or AHJ approved equivalent filtration or treatment approach in order to ensure requirements of AHJ permit are met.
2. Dewatering and construction stormwater discharge requirements to the public storm drain system shall be in conformance with the AHJ requirements. Dewatering is considered incidental to the contract and Contractor shall submit documentation and obtain the permit at no additional expense to Owner.
3. Submit turbidity and pH sampling reports to Owner’s Representative throughout duration of Project on a weekly basis and within 24 hours following a significant rain event (Rainfall depth/precipitation > 0.5 inches in a 24-hour period). Sampling, including frequency of tests, test reports and location of sampling shall be in accordance with WAC, WAC 173-201A and AHJ permit requirements. Contractor shall assume all costs associated with sampling, testing and reporting.
4. Samples for turbidity and pH testing shall be taken when construction stormwater from the site is discharging into the public storm drain system. Location for taking the sampling shall be approved by the AHJ Inspectors.
2.1 MATERIALS

A. Washed Gravel shall be coarse aggregate Aggregate conforming to AASHTO #4 gradation.

B. Inlet/Catch Basin Protection shall be in accordance with WSDOT Section 8-01.3(9)D for Below Inlet Grate such as Ultra DrainGuard®, Stream Guard® Sediment Catch Basin inserts, or an approved equivalent product. Insert shall be appropriately sized for the structure in which it is installed.

C. Straw bales shall be sun-dried and bundled with 12-gauge galvanized wire.

D. Filter Fabric Fence: conform to detail as noted on Plans. Geotextile shall conform to WSDOT Section 9-33.2 for temporary silt fence.

E. Hydroseeding Materials:
   1. Fertilizer: conform to WSDOT 9-14.3
   2. Seed Mix: conform to WSDOT Section 9-14.2 and shall be the following seed mix or an AHJ approved equal.

F. Plastic Covering: conform to WSDOT Section 9-14.5(3).


H. Quarry Spalls: conform to details on the Drawings. No asphalt allowed in spalls.

I. Straw mulch: Must be free of vegetation and seed that could establish upon placement of the mulch and conform to WSDOT Section 9-14.4 (1).

J. Mulches: Conform to WSDOT 9-14.4, and must be free of vegetation and seed that could establish upon placement of the mulch.

K. Wood chip mulch: conform to WSDOT 9-14.4(3).

L. Arborist Wood chip mulch: Arborist Wood Chip Mulch (AWCM) must be coarse ground wood chips (approximately 1/2inch to 6inches along the longest dimension) derived from the mechanical grinding or shredding of the above-ground portions of trees. It may contain wood, wood fiber, bark, branches, and leaves; but may not contain visible amounts of soil. It must be free of weeds and weed seeds Including but not limited to plants on the King County Noxious Weed list available at: http://www.kingcounty.gov/weeds, and must be free of invasive plant portions capable of resprouting, including but not limited to horsetail, ivy, clematis, and knotweed. It may not contain more than ½ percent by weight of manufactured inert material (such as plastic, concrete, ceramics, or
Arborist Wood Chip Mulch, when tested, must meet the following loose volume gradation:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
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<tbody>
<tr>
<td>2”</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>1”</td>
<td>70</td>
<td>100</td>
</tr>
<tr>
<td>5/8”</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>1/4”</td>
<td>0</td>
<td>40</td>
</tr>
</tbody>
</table>

1. The source of the product and species of trees included in it;
2. A sieve analysis verifying the product meets the above size gradation requirement;
3. A 5-gallon sample of the product, for the Engineer’s approval.

M. Excelsior Matting for dike stabilization: Use Landlok® TRM450, 6.5' wide roll, as manufactured by Synthetic Industries, or approved equivalent product.

N. Portable Storage and Filtration Systems:
   1. Portable storage tanks with filtration treatment conforming to Baker Tanks® media filter systems or Rain-for-Rent® or AHJ approved equivalent product.
   2. Design and sizing for pumps, portable storage tanks, filtration and treatment system shall be by a certified CESCL and included in Contractor’s CSWPP.

O. Sediment Trap:
   1. Sediment Trap: conform to details on Drawings, or as in the CSWPP reviewed by the AHJ.
      a. Sizing for trap, pumps, and other portable filtration and treatment system shall be by a certified CESCL and included in Contractor’s CSWPP.
      b. Sediment traps shown on the Drawings are intended to provide limited storage for the Portable Treatment system, and are not adequate for traditional sediment removal approach. Contractor shall be responsible for the sizing and placement of the sediment trap(s).
   2. Liner: use 20-mil polyvinyl chloride (PVC) or approved equivalent product.


Q. Wheel Wash: conform to NW Equipment Sales and Leasing Inc. Self-Contained Portable “The Soaker” wheel wash or approved equivalent product or provide approach identified and detailed in the CSWPP for AHJ review.
R. Clearing limits fencing: orange plastic safety construction fencing.

S. Stabilized Construction Entrance: conform to details on Drawings or an approach identified and detailed in the CSWPP for AHJ review. Filter Fabric conform to Mirafi® 140N or approved equivalent product.

T. Additional Erosion Control Measures: Provide in accordance with AHJ, the NPDES permit and/or Ecology, whichever is more stringent.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall designate a CESCL and CESCL back-up to be responsible for implementing and maintaining effective ESC to prevent violations of the AHJ permit(s) and other permits. The designated lead shall:

1. Be certified as indicated in Part 1.
2. Attend the AHJ Preconstruction Meeting(s).
3. Inspect the ESC measures daily and after storm events and keep a daily ESC site inspection log of the TESC measures on site. The log shall be made available at all times to AHJ Inspector, Owner’s Representative, and/or Owner.

B. Arrange for an AHJ inspection of the ESC facilities after initial installation and prior to starting any demolition, clearing, stripping, grading and/or utility operations. Obtain approval of the first installation of ESC facilities from the AHJ Inspector.

C. Install clearing limits fence for Owner’s Representative and AHJ Inspector’s review and approval. Do not begin clearing until approval has been obtained.

D. Perform TESC measures in accordance with the requirements of this Section, WSDOT Section 8-01, the COK and Ecology NPDES permits.

3.2 INSTALLATION, COORDINATION AND MAINTENANCE

A. Coordinate, install and maintain the ESC measures in accordance with the CSWPP/ESC Plan, Manufacturer's specifications and recommendations, AHJ, and Washington State Department of Ecology whichever is more stringent.

1. Coordinate and upgrade, revise or add additional ESC measures as needed to achieve compliance with the Project permit, related City permits and prevent sediment transport to surface waters, drainage systems, and adjacent properties.

a. The ESC measures shown on the Contract Documents are shown for AHJ permitting purposes only. The contractor is solely responsible for all means and methods and sequencing of ESC measures.
b. Install and sequence ESC measures as appropriate for the Contractor’s actual construction activities and phasing.
c. Install, maintain and upgrade ESC measures to conform with AHJ and Owner requirements at no additional cost to the Owner.

2. Coordinate and maintain ESC measures so that they function properly.
   a. Inspect daily and record inspection results.
   b. Promptly clean, repair, secure, replace or take other steps as necessary to keep ESC measures properly functioning. Clean accumulated sediment away from filter fabric fences, inlet protection or other sediment traps.
   c. Monitor water quality to verify compliance with the AHJ permits.
   d. Report violations of the permits immediately to the Owner’s Representative.
   e. Immediately implement contingencies described within the Contractor prepared AHJ reviewed CSWPP and install additional measures to correct violations and achieve compliance with the permits.
   f. Pay fines resulting from violations of the permits at no additional cost to the Owner.

3. Cover exposed stockpiles if exposed for more than 24 hours or when rain and/or severe wind are forecasted.
   a. Cover stockpiles with plastic. Anchor the plastic to maintain cover in place and adjust as required to maintain full cover after wind or other event.

4. Coordinate and seed as necessary in accordance with the CSWPP/ESC Plan and drawings, WSDOT Section 8-01, and as noted:
   a. Give the Owner’s Representative 48 hour notice of seeding operation.
   b. Do not seed during windy weather; when the ground is frozen or within 48 hours of forecast for rain.
   c. Seeding season will be March 15 to October 15, unless otherwise agreed to in writing by the Owner’s Representative.
   d. Do not seed on weekends or legal holidays without approval from Owner.
   e. Fertilizer, seed and mulch shall be applied in one operation with hydraulic equipment. Apply materials at the following rates:
      1) Water: As necessary.
      2) Wood Fiber Mulch: 2,000 lbs per acre.
      3) Seed: 40 lbs per acre. Fertilizer: six lbs per 1,000 square feet.
      4) Tackifier: 40 lbs per acre.
   f. Equipment shall use water as carrying agent utilizing continuous built-in agitation system. Equipment with a gear pump is not acceptable.
   g. Pump a continuous, non-fluctuating supply of homogenous slurry to provide a uniform distribution of material over designated areas.
   h. Reapply seed as necessary if it is removed after application such as from washing downstream, from birds and/or wildlife eating seed or from rainfall or from other means. Continue to apply seed until area is stabilized and vegetation is established. Reapplication of seed is to be at no additional cost to the Owner. Grass height shall reach a minimum 1.5 inches.
i. Implement measures including but not limited to watering, mowing, reseeding for establishment, maintenance and stabilization of vegetation from seed and germination at no additional cost to Owner.

5. Coordinate and install wattles per Manufacturer’s recommendations.
6. Coordinate and install the filter fabric fence per the details on the drawings and in a manner that prevents soil carried by runoff from going beneath, through, or over the top of the silt fence, but allow the water to pass through the fence.

B. Construct stabilized construction entrance(s) and wheel wash(s) at point of construction ingress and egress at AHJ approved location(s) identified in the CSWPP. Wheel washes shall be adequately sized and identified per the CSWPP to clean mud and debris from wheels, tires, suspension, frame and body of all vehicles exiting the Project as necessary to prevent tracking of mud and debris onto public roadways and newly paved areas. Number and location described on Plans is minimum unless otherwise determined by the AHJ and shown in the CSWPP. Contractor responsible for controlling ingress and egress points appropriate for approved access shown in the CSWPP.

C. Use phased demolition, clearing, grubbing and stripping to minimize disturbance of soil and erosion potential.

D. Clean catch basins, inlets and area drains in and adjacent to identified work area(s) prior to proceeding with Work in that area. Mud and sediment build-up shall be removed, and the cleaning operation shall not flush sediment-laden water and sediment into natural or constructed systems, including but not limited to catch basins, inlets and area drains. Provide catch basin protection for existing catch basins, inlets and area drains in and adjacent to work area. Provide catch basin protection for catch basins, inlets and area drains following installation, until site paving and landscaping are completed, and the site is stabilized and established.

E. Construct swales, check dams, earth dikes, berms, culverts, sediment traps, temporary storage units such as Baker Tanks® or Rain-for-Rent®, and/or similar controls identified in the CSWPP as needed to prevent sediment-laden discharge from leaving the construction activity zone identified in the CSWPP. ESC measures shall be in accordance with CSWPP and submittals. In addition, the following shall apply:

1. Apply seed mix to interceptor swales using the seed mix specified in this Section.
2. Accomplish earthwork in accordance with Section 31 00 00.

F. Keep existing and new drainage systems properly functioning at all times, in accordance with the CSWPP and ESC Plan and drawings, including but not limited to:

1. Clean catch basins, inlets and conveyance systems prior to beginning Work.
2. Do not allow sediment-laden stormwater to enter onsite catch basins and inlets prior to treatment.
3. Do not allow more than six inches of sediment to accumulate within catch basins, temporary ditches, gutters or other on-site structures. Do not allow sediment to discharge or filter into permanent storm drainage facilities such as infiltration facilities, porous pavement, natural drainage systems.

4. Inlet and catch basin protection devices shall be cleaned or removed and replaced when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

5. Do not allow sediment build-up within offsite catch basins, inlets, gutters and other drainage features.

6. Install and regularly clean catch basin inserts in all area drains, inlets and catch basins in accordance with AHJ requirements.

7. Install silt fence and wattles as noted on Plans, CSWPP and as dictated by Contractor’s means and methods. Maintain and remove accumulated sediment build-up behind silt fence and wattles or other ESC controls.

G. Do not allow sediment or other debris to accumulate offsite on adjoining public or private property. Clean up such accumulations immediately at no additional cost to the Owner.

H. Install Erosion Control Blankets in accordance with manufacturer recommendations and WSDOT Section 8-01.3(3).

I. Install other Erosion Control BMPs in accordance with manufacturer recommendations and WSDOT Section 8-01.3.

J. Due to the fine soils at Project site, use of Chitosan-Enhanced Sand Filter or an AHJ approved equivalent filtration system shall be used in conjunction with other TESC BMPs as needed to meet the AHJ water quality discharge requirements. Note: Any alternative methods for treatment approach must be submitted to the AHJ in the Contractor’s CSWPP for AHJ review. Sizing for pumps, tanks, filtration and Chitosan treatment system shall be by a certified CESCL and submitted to AHJ for review and modified as needed to address AHJ review comments prior to installation.

3.3 SPILL PREVENTION CONTROL AND COUNTERMEASURES PLAN

A. General:

1. Locate storage areas for toxic or hazardous materials in such a manner that spilled materials will not enter the storm drainage system.

2. Provide secondary containment around those areas designated for toxics or hazardous materials to prevent spills from entering storm drainage systems.

3. Locate vehicle parking areas so that spilled fuel or oil will not enter the storm drainage system.

4. Locate decontamination and toxic and hazardous waste storage areas in such a manner that spilled materials will not enter the storm drainage system.

B. Protect storm drain inlets, swales, drain curb cuts and other entry points to storm drain system with materials or devices such that spills do not enter the storm drainage system.
C. Spill Clean-Up:

1. Notify Owner’s Representative immediately if toxic or hazardous materials are spilled.
2. Notify the Washington State Department of Ecology and AHJ Inspector immediately following a spill of a toxic or hazardous material.
3. Clean up spills promptly and completely, and in accordance with AHJ requirements.
4. Report as required to AHJ.

3.4 WET SEASON GRADING

A. See AHJ requirements and the notes on the drawings for special requirements associated with grading operations between October 31 and April 1. Contractor shall be responsible for documentation and process necessary to obtain a permit with specific requirements due to Contractor’s mean, methods and operations.

3.5 TESC REMOVAL AND CLEANUP

A. Upon completion of improvements and when areas upstream are stabilized from erosion and approval is obtained from the owner and AHJ Inspector remove ESC measures. Identify in writing if removal operations deviate from the CSWPP and/or ESC Plan submitted.

1. At areas with excavations for ESC, such as Sediment Traps or interceptor swales, remove and properly dispose of offsite, trap liner, temporary piping, debris, unsuitables, sod, strippings and other Section 31 00 00 - Earthwork and complete improvements.
2. Inlet and catch basin protection measures shall be removed within five (5) business days after final site stabilization is achieved.

B. Install restoration measures and implement measures for establishment of grass and plantings upon removal and backfilling of sediment traps, interceptor swales and other ESC measures. These measures shall include providing temporary BMP’s as appropriate at the site edges such as compost sock, triangle dike or silt fencing. The edge control BMP’s to be removed 30-days after certificate of occupancy or otherwise approved by Owner.

END OF SECTION
SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES

A. This Section specifies administrative and procedural requirements for materials and equipment related to:
   1. Transportation and handling
   2. Storage and protection
   3. Product options

1.03 DEFINITIONS

A. Performance Specifications: No manufacturer is specified, and requirements are specified by descriptive requirements, design requirements, performance requirements, reference standards, and codes. Product options complying with or exceeding provisions of Contract Documents are acceptable and require no Substitution Request.

B. Closed Proprietary Specifications: Products by one or more manufacturers are specified and specification Section does not allow for approval of other products by Substitution Request. No other product options will be accepted. Provide products and Work specified.

C. Open Proprietary Specifications: Products by one or more manufacturers are specified, and specification Section allows for approval of other products by Substitution Request. Submit Substitution Request for other products to Architect under provisions of this Section.

1.04 SUBSTITUTION REQUESTS DURING BIDDING PERIOD

A. Submit Substitution Request to reach Architect's office before 5:00 PM at least ten (10) working days prior to date for receiving Bids, and in conformance with Instructions to Bidders.

B. Bidders will be notified by Addendum of products approved in addition to those specified. No other form of approval, including verbal or implied, is acceptable to indicate approval of Substitution Request.
1.05 SUBSTITUTION REQUESTS DURING CONSTRUCTION PERIOD

A. Substitution Requests, submitted by Contractor will not be considered, except for the following reasons. Indicate one or more reasons why substitution is required with Substitution Request.
   1. Unavailability: Specified item has been discontinued or is unavailable in time to meet Construction Schedule through no fault of Contractor or subcontractor.
   2. Unsuitability: Subsequent information discloses specified item is unsuitable, inappropriate, unable to perform properly, or fit designated space.
   3. Regulatory Requirements: Substitution is required to comply with Code interpretations or insurance regulations.
   4. Warranty: Manufacturer or fabricator declare specified item to be unsuitable for use intended or refuses to certify or warrant performance of specified item for Project.

B. During Construction Period, Contractor will be notified by Architect in writing of decision to accept or reject Substitution Request.

1.06 SUBMITTAL REQUIREMENTS

A. Submit two copies of Substitution Request. Limit each request to one Substitution Request form.

B. Burden of proof is upon Substitution Request, as proposed, to show compliance with specified requirements. Submit drawings, product data, samples, certified test results, and as needed to fully describe Substitution request for evaluation by Architect.

C. Where product data includes other than that proposed by substitution Request, clearly mark, or otherwise indicate, exact substitution.

D. Document each Substitution Request with complete data substantiating that proposed substitution complies with provisions of Contract Documents.

E. Submission of Substitution Request constitutes representation that Bidder or Contractor:
   1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product.
   2. Shall provide the same or better warranty for substitution as for specified product.
   3. Shall be responsible for effect of substitution upon related Work, shall coordinate installation, and be responsible for other changes which may be required for Work to be complete in all respects, in compliance with design intent and in compliance with all applicable codes and regulatory requirements.
   4. Be responsible for additional costs which may subsequently become apparent. This includes additional costs for required additional Architect's services made necessary by the substitution.
   5. Shall provide all cost savings to Contract Sum as credits.
6. Shall provide specified product, material, or system should substitution be rejected, at no change in Contract Sum.

F. Substitutions indicated or implied on submittals, such as Shop Drawings, will not be accepted.

G. Products and materials included in the Work, not specified or approved by Substitution Request, are defined as Non-Conforming Work. Remove and replace with conforming Work at Contractor’s expense with no increase in Contract Time, as directed by Architect.

1.07 ARCHITECT WILL NOT CONSIDER

A. Substitution Requests which do not provide adequate or clearly defined information for complete and timely appraisal.

B. Substitutions which, if accepted, will require substantial revisions of Contract Documents.

C. Substitution indicated or implied by Shop Drawings and other submittals.

D. Substitutions not approved by published Addendum during Bid Period or not approved in writing by Architect during Construction period.

E. Substitutions not submitted on completed Substitution Request Form.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 01 61 00

SUBSTITUTION REQUEST FORM

SUBMITTED TO:

PROJECT: CITY OF KIRKLAND
JUANITA BEACH PARK BATHHOUSE

SPECIFIED ITEM:

Section No.   Paragraph No.   Description of Specified Item

The Undersigned requests consideration for the following substitution to that specified

PROPOSED SUBSTITUTION:

ATTACHED DATA:

Include product description, specifications, drawings, photographs, performance, and test data as necessary for evaluation. Clearly identify proposed substitution and portions of data from other items where more than one item is described.

Include description of changes to Contract Documents required by proposed substitution.

CERTIFICATION:

The Undersigned certifies that the following paragraphs are correct:

1. Proposed substitution does not affect dimensions shown on Drawings.
2. The Undersigned will pay for changes to building design, including engineering design, detailing, and construction costs, caused by requested substitution.
3. Proposed substitution will have no adverse effect on other trades, Construction Schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for proposed substitution.

Undersigned further states that function, appearance, and quality of proposed substitution are equivalent or superior to specified item.

05/31/19
SUBMITTED BY:
Signature ____________________
Firm _________________________
Address _______________________

Date _________________________
Telephone (      ) _____________
FAX (      ) _________________

LIST ATTACHMENTS:

FOR USE BY ARCHITECT:
☐ Approved  ☐ Approved as Noted
☐ Not Approved  ☐ Received too Late

By __________________________
Date _________________________
Remarks _______________________
PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 EXAMINATION

A. Inspect the site and location of the Work and become acquainted with and understand all conditions relating to the Work to be performed under this Contract.

1.03 GRADES, LINES, AND LEVELS

A. Datum: Locate grades, lines, and levels from established reference points and datum furnished on Drawings.

B. Staking and Grading: Locate and stake out new construction and facilities. Be responsible for accuracy and correctness of lines and grades, and for establishing location of buried utility lines.

1.04 EXISTING UTILITIES

A. Verify location and depth of existing utilities and services before performing excavation Work.

1.05 ACCURACY OF DATA

A. Site data shown are as exact as could be obtained, but their absolute accuracy cannot be guaranteed. Exact locations, distances, elevations, and similar data shall be governed by field conditions and Owner's instructions.

1.06 QUALIFIED SERVICES

A. Retain and pay expenses of a professional licensed land surveyor to establish building lines, elevations grade, utility and datum points.

1.07 SURVEY REFERENCE POINTS

A. Locate and protect control points prior to starting Work. Preserve all permanent reference points during construction.

1.08 RECORDS

A. Maintain a complete, accurate log of control and survey Work as it progresses.
B. On completion of foundation walls and major Site improvements, prepare a certified survey showing dimensions, locations, angles, and elevations of construction.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 01 74 00
CLEANING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
   A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SUMMARY
   A. Throughout the construction period, maintain the building and site in a standard of cleanliness as described in this Section.
   B. Related work:
      1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1.
      2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections.

1.03 QUALITY ASSURANCE
   A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.
   B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

2.01 CLEANING MATERIALS AND EQUIPMENT
   A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

2.02 COMPATIBILITY
   A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.
PART 3 - EXECUTION

3.01 PROGRESS CLEANING

A. General:
1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:
1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Re-stack, tidy or otherwise service arrangements to meet specified requirements.
3. Maintain the site in a neat and orderly condition at all times.

C. Structure:
1. Weekly, and more often if necessary, inspect the structures and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, sweep interior spaces clean.
   a. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by use of reasonable effort and a hand-held broom.
3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.
   a. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.
   b. "Clean," for the purpose of this subparagraph, shall be interpreted as meaning free from foreign material which, in the opinion of the Architect, may be injurious to the finish floor material.

3.02 FINAL CLEANING

A. "Clean," for the purpose of this Article, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.
B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

C. Site:
   1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site.
   2. Completely remove resultant debris.

D. Structure:
   1. Exterior:
      a. Visually inspect exterior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
      b. Remove all traces of splashed materials from adjacent surfaces.
      c. If necessary to achieve a uniform degree of cleanliness, hose down the exterior of the structure.
      d. In the event of stubborn stains not removable with water, the Architect may require light sandblasting or other cleaning t no additional cost to the Owner.
   2. Interior:
      a. Visually inspect interior surfaces and remove all traces of soil, waste materials, smudges, and other foreign matter.
      b. Remove all traces of splashed material from adjacent surfaces.
      c. Remove paint droppings, spots, stains, and dirt from finished surfaces.
      d. Glass: Clean inside and outside.
      e. Polished surfaces: To surfaces requiring routine application of buffed polish, apply the polish recommended by the manufacturer of the material being polished.

E. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work.

END OF SECTION
SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL (NOT USED)

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to Authorities Having Jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Waste and debris removed from the worksite and not specified for reuse becomes the responsibility of the Contractor and disposed of off park property in areas authorized by the applicable county and/or state agencies and in accordance with current rules and regulations governing the disposal of solid waste. Disposal fees and sundry charges are paid by the Contractor and are incidental to the contract.

C. Burning: Do not burn waste materials.

D. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION
PART 1 - GENERAL

1.01 RELATED DOCUMENTS
   A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SUMMARY
   A. To aid the continued instruction of operating and maintenance personnel, and to provide a positive source of information regarding the products incorporated into the Work, furnish and deliver the data described in this Section and in pertinent other Sections.

   B. Related Work:
      1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1.
      2. Required contents of submittals also may be amplified in pertinent other Sections.

1.03 SUBMITTALS
   A. Comply with applicable provisions of Section 01 33 00 – Submittal Procedures.

   B. Submit two copies of a preliminary draft of the proposed Manual or Manuals to the Architect for review and comments.

   C. Unless otherwise directed in other Sections, or in writing by the Architect, submit three copies of the final Manual to the Architect prior to instruction of operation and maintenance personnel.

1.04 QUALITY ASSURANCE
   A. In preparing data required by this Section, use only personnel who are thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this Section, and skilled in technical writing to the extent needed for communicating the essential data.
PART 2 - PRODUCTS

2.01 INSTRUCTIONS

A. Where instruction Manuals are required to be submitted under other Sections of these Specifications, prepare in accordance with the provisions of this Section.

B. Format:
   1. Size: 8-1/2" x 11".
   3. Text: Neatly written or printed.
   4. Drawings: 11 inch height preferable; bind in with text; foldout acceptable; larger drawings acceptable but fold to fit within the Manual and provide a drawing pocket inside rear cover or bind in with text.
   5. Flysheets: Separate each portion of the Manual, by Specification Section, with neatly prepared flysheets briefly describing contents of the ensuing portion; flysheets may be in color.
   6. Binders: Commercial quality heavy-duty plastic or fiberboard 3-ring D-ring binders. All binding is subject to the Architect's approval.
   7. Measurements: Provide all measurements in U. S. standard units such as feet-and-inches, lbs, and cfm.
   8. Manuals shall be clearly identified on the cover with at least the following information:

2.02 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Labels: Provide labels as follows:
   (                                  )
   ( Name and address of work       )
   ______________________________________
   (                                  )
   ( Name of contractor            )
   ______________________________________
   (                                  )
   ( General subject of this Manual )
   ______________________________________
   (Space for approval signature of )
   ______________________________________
   (The Architect and approval date )

B. Contents: Include at least the following:
   1. Neatly typewritten index near the front of the Manual, giving immediate information as to location within the Manual of all emergency information regarding the installation.
   2. Complete instructions regarding operation and maintenance of all equipment involved including lubrication, disassembly, and re-assembly.
   3. Complete nomenclature of all parts of all equipment.
PART 3 - EXECUTION

3.01 INSTRUCTION MANUALS

A. Preliminary:
   1. Prepare a preliminary draft of each proposed Manual.
   2. Show general arrangement, nature of contents in each portion, probable number of drawings and their size, and proposed method of binding and covering.
   3. Secure the Architect's approval prior to proceeding.

B. Final: Complete the Manuals in strict accordance with the approved preliminary drafts and the Architect's review comments.

C. Revisions:
   1. Following the indoctrination and instruction of operation and maintenance personnel, review all proposed revisions of the Manual with the Architect.
   2. If the Contractor is required by the Architect to revise previously approved Manuals, compensation will be made as provided for under "Changes" in the General Conditions.

END OF SECTION
SECTION 01 78 70

WARRANTIES AND BONDS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SUMMARY

A. Compile specified certificates, bonds and similar certification.

B. Compile specified services and maintenance contracts.

C. Co-execute submittals when so specified.

D. Review submittals to verify compliance with Contract Documents.
   1. Submit to Architect on Contractor's letterhead. Architect reviews and transmits to Owner.

E. Related Requirements:
   1. Coordinate related requirements specified in other parts of the Project Manual, including but not limited to following.
      a. Operating and Maintenance Data/Section 01 78 50.
      b. Each respective Section as required.

1.03 SUBMITTALS

A. Assemble executed certificates, warranties, bonds, and any required service and maintenance contracts from the respective manufacturers, suppliers and subcontractors.

B. Number of original signed copies required: Two each.

C. Contents: Neatly type Table of Contents in orderly sequence. Furnish complete information for each item as follows:
   1. Product or work item;
   2. Firm, with name of principal, address, and telephone number;
   3. Scope;
   4. Date of beginning of warranty or service and maintenance contract;
   5. Duration of warranty or service maintenance contract;
   6. Information for Owner's personnel, including:
      a. Proper procedure in case of failure;
   7. Instances which might affect validity of warranty or bond.
   8. Contractor, name of responsible principal, address, and telephone number.
1.04 FORM OF SUBMITTALS

A. Prepare in duplicate, packets conforming to following requirements.
   1. Size: 8-1/2" X 11" punched sheets for 3-ring binder. Fold larger sheets to fit into binders.
   2. Binders: Commercial quality heavy-duty plastic or fiberboard 3-ring D-ring binders. All binding is subject to the Architect's approval.
   3. Covers: Identify each packet with typed or printed title "WARRANTIES AND BONDS" and showing:
      a. Title of Project.
      b. Name of Contractor.

B. Format/Warranties/Guarantees:
   1. In addition to guarantees required by "General Conditions of Contract", furnish written guarantees warranting certain portions of work for longer periods.
   2. Address them to Owner.
   3. Submit through Architect on Contractor's letterhead before final payment and acceptance of work by Owner.
   4. Where more than one subcontractor is involved, submit guarantee for each.

C. Form of Guarantee for other specified installation:
   1. I (We), (insert name of contractor), certify (insert name of trade or portion of work being guaranteed) installed by (insert name of appropriate subcontractor) on (insert name of job) located at (Street address or location), is performed in strict accordance with Contract Documents. Further, I (We) guarantee this work to be (watertight, and without leaks) (other) caused by defects in materials and workmanship, for (fill in specific required guarantee period) years from (date of acceptance of work), and will repair, or replace, without delay, any defects in materials and workmanship discovered within guarantee period.

   Sincerely,

   (Name of Contractor/responsible principal/address/telephone number).

   Signed by Owner, Partner, or other person authorized to commit firm.)

1.05 TIME OF SUBMITTALS

A. For equipment or component parts of equipment put into service during progress of construction:
   1. Submit documents within ten days after final inspection and acceptance; or:
      a. Otherwise make submittals within ten days after Date of Substantial Completion, prior to final request for payment.

B. For items of work, where acceptance is delayed materially beyond the date of Substantial Completion, provide updated submittal within ten days after acceptance. List the date of acceptance as the start of the warranty period.

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1.06 WARRANTY LENGTHS AND START DATES

A. All materials, parts, and labor shall be warranted for a minimum period of (1) one year; unless greater lengths for specific sections are specified elsewhere within the Project Manual.

B. Warranty periods shall begin on the date established as Substantial Completion.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 01 78 90

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SUMMARY

A. Section Includes:
   1. Throughout progress of the Work, maintain an accurate, consolidated and legible record of changes in Contract Documents, as specified.
   2. Product Substitution Procedures: Section 01 60 00 – Product Requirements.
   3. Upon completion of the Work, transfer recorded changes to a set of Record Documents, as specified.
   4. Other requirements affecting Project Record Documents may appear in other pertinent Sections.

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01 33 00 – Submittal Procedures.

B. Architect's approval of the current status of Project Record Documents may be a prerequisite to the Architect's approval of requests for progress payment and request for final payment under the Contract.

C. Prior to submitting request for final payment, submit final Project Record Documents, including survey (see Section 01 72 00), to the Architect and secure approval.

1.04 QUALITY ASSURANCE

A. Delegate the responsibility for maintenance of Record Documents to one person on the Contractor's staff as approved by the Architect.

B. Accuracy of records:
   1. Thoroughly coordinate changes within Record Documents, making adequate and proper entries on each page of Specifications and each sheet of Drawings and other Documents where such entry is required to show the change properly.
   2. Accuracy of records shall be such that future search for items shown in Contract Documents may rely reasonably on information obtained from approved Project Record Documents.
   3. Make entries within 24 hours after receipt of information that the change has occurred.
1.05 PRODUCT HANDLING

A. Maintain job set of Record Documents completely protected from deterioration and from loss and damage until completion of the Work and transfer of all recorded data to final Project Record Documents.

B. In the event of loss of recorded data, use means necessary to again secure data to Architect's approval.
   1. Such means shall include, if necessary in the opinion of the Architect, removal and replacement of concealing materials.
   2. In such case, provide replacements to the standards originally required by Contract Documents.

PART 2 - PRODUCTS

2.01 RECORD DOCUMENTS:

A. Job set: Promptly following receipt of Owner's Notice to Proceed, secure from the Architect at no charge to the Contractor one complete set of all Documents comprising the Contract.

B. Final Record Documents: At a time nearing completion of the Work, Contractor to clearly mark in red all as-built conditions for existing underground utilities, conduits, pipes, drains etc.

PART 3 - EXECUTION

3.01 MAINTENANCE OF JOB SET

A. Immediately upon receipt of the job set described in Paragraph 2.01.A, identify each of the Documents with the title, "RECORD DOCUMENTS - JOB SET."

B. Preservation:
   1. Considering the Contract completion time, probable number of occasions upon which the job set must be taken out for new entries and for examination, and conditions under which these activities will be performed, devise a suitable method for protecting the job set to the approval of the Architect.
   2. Do not use the job set for any purpose except entry of new data and for review by the Architect, until start of transfer of data to final Project Record Documents.
   3. Maintain job set at the site of Work as that site is designated by the Architect.

C. Making entries on Drawings:
   1. Using an erasable colored pencil (not ink or indelible pencil), clearly describe the change by graphic line and note as required.
   2. Date all entries.
   3. Call attention to the entry by a "cloud" drawn around the area or areas affected.

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4. In the event of overlapping changes, use different colors for overlapping changes.

D. Make entries in pertinent other Documents as approved by the Architect. In addition to Drawings and Specifications, a current set of the following documents shall be maintained in the Field Office Building: Addenda, Shop Drawings, Field Clarifications, Modification Proposals, Change Orders, and other Contract Modifications.

E. Conversion of schematic layouts:
   1. In some cases on the Drawings, underground utilities, arrangements of conduits, circuits, piping, ducts, and similar items are shown schematically and are not intended to portray precise physical layout.
      a. Final physical arrangement is determined by the Contractor, subject to the Architect's approval.
      b. However, design of future modifications of the facility may require accurate information as to the final physical layout of items which are shown only schematically on the Drawings.
   2. Show on the job set of Record Drawings, by dimension accurate to within one inch, the centerline of each run of items such as are described in subparagraph 3.01.E.1 above.
      a. Clearly identify the item by an accurate note such as "cast iron drain," "galv. water," and similar items.
      b. Show, by symbol or note, vertical location of the item ("under slab," "in ceiling plenum," "exposed," and similar situations).
      c. Make all identification sufficiently descriptive that it may be related reliably to Specifications.
   3. The Architect may waive requirements for conversion of schematic layouts where, in the Architect's judgment, conversion serves no useful purpose. However, do not rely upon waivers being issued except as specifically issued in writing by the Architect.

F. Final Project Record Documents:
   1. The purpose of the final Project Record Documents is to provide factual information regarding all aspects of the Work, both concealed and visible to enable future modification of the Work to proceed without lengthy and expensive site measurement, investigation, and examination.
   2. Approval of recorded date prior to transfer:
      a. Carefully transfer change data shown on the job set of Record Drawings to the corresponding transparencies, coordinating changes as required.
      b. Make required revisions.
   3. Transfer of data to Drawings:
      a. Carefully transfer change data shown on the job set of Record Drawings to the corresponding transparencies, coordinating the changes as required.
      b. Clearly indicate at each affected detail and other Drawing a full description of changes made during construction, and the actual location of items described in subparagraph 3.01.E.1 above.
c. Call attention to each entry by drawing a "cloud" around the area or areas affected.
d. Make changes neatly, consistently, and with the proper media to assure longevity and clear reproduction.
e. The job set of record drawings shall be made available to the Architect for cross checking the corresponding transparencies after the transmittal of the transparencies to the Architect.

4. Transfer of data to other Documents:
   a. If Documents other than Drawings have been kept clean during progress of the Work, and if entries thereon have been orderly to the approval of the Architect, the job set of those Documents other than Drawings will be accepted as final Record Documents.
   b. If any such Document is not so approved by the Architect, secure a new copy of that Document from the Architect at the Architect's usual charge for reproduction and handling, and carefully transfer the change data to the new copy to the approval of the Architect.

5. Review and submittal:
   a. Submit completed set of Project Record Documents to the Architect as specified herein.
   b. Participate in review meetings as required
   c. Make required changes and promptly deliver the final Project Record Documents to the Architect.

G. Changes Subsequent To Acceptance: The Contractor has no responsibility for recording changes in the Work subsequent to Final Completion, except for changes resulting from work performed under Warranty.

END OF SECTION
SECTION 01 82 00
DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS
   A. Drawings and general provisions of Contract, including General Conditions, Supplementary Conditions and Divisions 00 and Division 01 Specification Sections, apply to work of this Section.

1.02 SECTION INCLUDES
   A. Section includes general requirements and procedures for demonstration of products and systems, and training of Owner’s operating and maintenance personnel.
   B. Work requiring instruction of Owner’s personnel is specified in individual Sections.
   C. Related Sections:
      1. Section 01 78 50 – Operation and Maintenance Data.

1.03 COMMISSIONING
   A. Schedule instructional meeting or meetings within 2 weeks after Operation and Maintenance manuals have been accepted by the Architect.
   B. Prior to final inspection, fully qualified manufacturers’ representatives shall fully instruct Owner’s designated operating and maintenance personnel in operation, adjustment, and maintenance of equipment and systems.
   C. Basis of Instruction: Operation and maintenance manuals. Review contents of manuals with Owner’s designated personnel, in full detail, to explain all aspects of operation and maintenance.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION
SECTION 02 41 19

STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Project Conditions
B. Temporary Security Fencing
C. Clearing and Grubbing of Imperishable Debris
D. Removal of Concrete and Asphalt
E. Demolish Structures
F. Drainage
G. Disposal of Materials
H. Clean Up

1.2 RELATED SECTIONS

A. Coordinate related work specified in other parts of the Project Specifications, including, but not limited to the following:
1. 01 56 39 - Tree Plant and Soil Protection
2. 01 57 13 – Temporary Erosion and Sediment Control
3. 02 22 00 – Selective Site Demolition
4. 31 10 00 – Site Clearing; for additional clearing and grubbing requirements

1.3 PROJECT CONDITIONS

A. Utilities
1. Verify location of all utilities using a utility locate before commencement of the Work.
2. Do not shut off or cap utilities without prior notice. Coordinate work with Division 1 requirements.
3. Remove no utilities, unless shown on the drawings or as specified or directed by the Owner’s Representative.
4. If unexpected conditions arise, stop work and immediately notify the Owner’s Representative.
5. In all phases of the Work, damage caused by the Contractor to any existing utilities shall be repaired by the Contractor at no additional cost to the Owner.
6. Contractor shall pay all costs and fees associated with utility disconnects, capping, line, and meter removal.

B. Monuments

1. Carefully protect and maintain all benchmarks, monuments and other reference points.
2. If disturbed or destroyed, replace at the Contractor’s expense.

C. Failure to Preserve Trees and Existing Vegetation

1. If the Contractor damages or destroys a tree or existing vegetation, which has been specified to be preserved, or fails to replace a tree damaged or destroyed as a result of their operations, the Contractor shall compensate the Owner in accordance with 01 56 39 – Tree Plant and Soil Protection.

D. Protection of Existing Improvements

1. Provide, erect, and maintain fencing and barricades, coverings, or other types of protection necessary to prevent damage to existing pavements, walls, structures, utilities, or other existing site improvements indicated to remain in place.
2. Cut and cap existing irrigation lines when encountered. Mark locations on record drawings.
3. Restore any improvements damaged by this work to their original condition and as acceptable to the Owner’s Representative.
4. Verify that all appropriate services have been disconnected prior to commencing construction.
5. Contractor shall pay all costs and fees associated with disconnects, capping, line, and meter removal.
6. Maintain street and site drains and sewers open for free drainage.

E. Objectionable Noises

1. Limit use of air hammers and other noisy equipment as much as possible.
2. Conform with local governing requirements regarding Noise Control.

F. Maintain vehicular and pedestrian traffic routes:

1. Do not close or obstruct streets, paths, easements, or passageways without permission from authorities having jurisdiction.
2. If required by governing authorities, provide signed alternate routes around closed or obstructed traffic ways.
3. Signage shall comply with MUTCD.

G. Site Access:
1. Access route for construction shall be as indicated on the Plans and as verified at the pre-construction meeting.
2. Provide a project staging, access, and material storage plan, within ten (10) days of notice to proceed.

PART 2 - PRODUCTS

2.1 TEMPORARY SECURITY FENCING

A. Prefabricated portable galvanized chain link fence panels including fabric, posts, top and bottom rails, and temporary posts and concrete post bases.

B. Driven posts shall be used on panels erected in areas of sloping or uneven terrain.

C. Prefabricated Portable Fence Panels:

1. Shall be a minimum of 6 feet high by minimum 8 feet wide and maximum 10 feet wide or as detailed on Plans.
   a. Posts - minimum 1-1/2 inches OD Schedule 40 galvanized steel pipe.
   b. Fabric - minimum 11 gauge galvanized two-inch diamond mesh steel wire interwoven with twisted selvage top and bottom.
   c. Post bases shall be minimum 16 inches by 8 inches by 8 inches tall concrete pier with sleeve for post, or as approved.
   d. Wire ties shall be 9 gauge aluminum wire and installed within 6 inches of the top and bottom of each post, and a minimum of 18 inches on center between and 18 inches on center on all top and bottom rails.

2. Construct prefabricated portable temporary fence panels to industry standards for fixed chain link fencing.
3. Connect panels mechanically by means of pre-fabricated, bolted bracket manufactured specifically for the purpose.
4. Do not wire panels together.

D. Bracing:

1. Provide additional panels or outriggers as necessary to provide a rigid, stable run of fence.
2. Use only pre-manufactured outriggers or additional fence panels.

E. Signage:

1. Provide warning signage every 50 feet of running fence line.
2. Signs: minimum 18 inch square, brightly colored with contrasting lettering as follows:

   WARNING

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3. Or, as approved by the Owner’s Representative.

F. Driven Post Fencing:
   1. Same materials as above with posts driven to sufficient depth to assure stability and durability for the life of the installation, maintaining a minimum of 6’ above grade.

G. Gates:
   1. Provide swing gates, 20 foot opening in two prefabricated panels with double padlocks to allow Contractor and Owner forces entry. Hinged sides of each operating panel shall include double bracketing. Owner will provide 1 lock keyed for Owner personnel for each entry. Contractor shall provide a lock keyed for Contractor and Subcontractors for each entry.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify with Owner’s Representative that clearing and site improvement, removal and relocation may safely and appropriately begin.

B. Pay for and obtain all required permits and permission prior to commencing work.

3.2 TEMPORARY SECURITY FENCE INSTALLATION

A. Secure the project site from trespass or unintentional entrance by unauthorized personnel.

B. All disturbed ground stockpiles, staging areas, and on-site transport routes shall be fully enclosed by temporary security fencing.

C. Areas either under construction or completed but not specifically accepted by the Owner’s Representative as Substantially Complete shall be completed enclosed with temporary security fencing.

D. Areas included in the Contract but not yet under construction may be left open to public access at the discretion of the Owner’s Representative.

E. Where long straight runs result in an unstable condition, sufficient out-rigging shall be incorporated to maintain fencing upright. Out-riggers shall be placed on the interior side of the fence unless approved by the Owner’s Representative. Alternatively, and where appropriate, a “zigzag” arrangement of panels for stability may be used.

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F. Uneven Terrain:

1. Where uneven terrain will not allow the use of pre-manufactured portable fence panels, or where otherwise directed by the Owner’s Representative, drive posts directly into the earth plumb and eight feet (8’) on center along the approved alignment. Contractors shall perform a complete locate for all underground utilities in areas to receive driven posts. Reset loose posts at the direction of the Owner's Representative.

2. Provide posts at each end of each driven post installation at a point that is sufficiently level to clamp prefabricated portable fence panels directly to the driven post installation.

G. Where approved for short-term, low security applications, use four foot (4’) high orange PVC web fencing wired to #5 reinforcing bar “posts” driven a minimum 36 inches into existing grade and spaced five feet (5’) on center. Cap each bar with a safety cap manufactured specifically for #5 reinforcing steel.

3.3 CLEARING AND GRUBBING AROUND EXISTING TREES AND VEGETATION TREES

A. All clearing and grubbing around the bases of existing trees and vegetation to remain shall be performed by hand methods.

B. No machinery, vehicles, or storage of materials shall be allowed within the drip line of existing trees to remain except as shown on Plans.

C. Contractor shall be responsible for all damage to existing trees and vegetation to remain.

3.4 CLEARING AND GRUBBING OF IMPERISHABLE DEBRIS

A. Remove all imperishable debris that would be unsuitable for bearing or growing medium as applicable, including, but not limited to, rocks, pipe, and existing construction.

3.5 CLEARING AND GRUBBING OF VEGETATION

A. Remove designated vegetation, including roots, geotextile fabric, and excess soil only where indicated on Plans and only as minimally required for new construction. Removal operations shall be performed in a manner to protect property.

B. Sprinkle water over excavated material and stripped areas as necessary to limit dust to lowest practicable level. Do not use water to the extent causing flooding, contaminated runoff or icing.
3.6 REMOVAL OF CONCRETE AND ASPHALT

A. Saw cut and demolish asphalt paving as shown on the drawings. Dispose of demolished paving materials in an approved manner off site.

3.7 DEMOLISH STRUCTURES

A. Demolish existing buildings, footings, post and pole fence and other items as shown on drawings.

B. Dispose of all demolished materials in an approved manner off site.

3.8 DRAINAGE

A. Keep street, parking lot, and site drains clear of mud and sediment build-up and open for drainage at all times.

B. Open pits and holes caused as a result of demolition work shall be kept free of standing water.

3.9 DISPOSAL OF MATERIALS

A. The refuse resulting from clearing and demolition shall be disposed of by the Contractor in a manner consistent with all government regulations.

B. Debris hauled off site shall not be deposited 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.

C. Maintain hauling routes clean and free of any debris resulting from work of this Section.

3.10 CLEAN UP

A. Clean trucks and other equipment as required before entering access drive and roads.

B. Clean drives and roads daily or as required to avoid dust, unsightly appearance, or water quality impacts.

END OF SECTION
SECTION 02 41 13
SELECTIVE SITE DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Work includes, but is not limited to the following:

1. Selective demolition, haul, and disposal of asphalt paving.
2. Selective demolition, haul, and disposal of concrete paving.
3. Demolition, haul, and/or disposal of miscellaneous site features.

1.2 RELATED SECTIONS

A. Coordinate with related Work specified in other parts of the Project Manual.

1.3 REFERENCES:

A. Reference the following standards:

WISHA Washington Industrial Safety and Health Act. Revised Code of Washington (RCW) Chapter 49.17
WAC Washington Administrative Code (WAC) 296-155 Standards for Construction Work
UBC Uniform Building Code, as adopted by Authority Having Jurisdiction (AHJ).
PSCAA Puget Sound Clean Air Agency (Regulations I, II and III available by writing, calling, or visiting the agency).
L & I Washington State Labor & Industries Regulations.

1.4 QUALITY ASSURANCE & SUBMITTALS:

A. Submit the following information in conformance with submittal procedures noted in Division 01.

1. Copies of permits obtained including but not limited to side sewer permit for temporary dewatering, and King County Industrial Waste Discharge Permit and Street User Permit.
2. Copies of operating permits for disposal and recycle sites.
3. Demolition Plan for the Owner’s information:
a. Schedule of demolition activities indicating the following:
b. Detailed sequence of demolition and removal Work, with starting and ending dates for each activity.
c. Narrative describing demolition and removal procedures for each activity.
d. Proposed legal dump sites, legal recycling sites, and legal landfills for demolition and land clearing debris.
e. Traffic control and haul routes.
f. Conditions Survey of structures or features potentially affected by demolition and construction activities.
g. Measures to protect adjacent structures and other features to remain from damage.
h. Contingency measures if damage occurs from construction activity.

4. Photographs sufficiently detailed, of existing conditions of adjoining construction, structures, trees and vegetation to be retained, and site improvements that might be misconstrued as damage caused by demolition operations. Label photos to describe location, direction, date of photo and significant features.

5. Landfill and/or recycling records indicating receipt and acceptance of wastes by a landfill and/or recycling facility licensed to accept those wastes. Copies of trip tickets for all material transported to approved landfills and/or recyclers.

6. The Contractor may secure its own demolition debris, asphalt, concrete and creosote materials disposal or recycle site(s) provided it has acquired all permits and approvals necessary from governing agencies and the Owner’s Representative in writing.

1.5 PROJECT CONDITIONS:

A. Owner assumes no responsibility for actual condition of elements to be removed, demolished, retired or abandoned.

1. Conditions existing at time of inspection for proposal purposes will be maintained by Owner as far as practical.

B. If any materials suspected of containing asbestos are encountered see General Conditions and notify the Owner immediately.

C. Buildings immediately adjacent to demolition area will be occupied. Conduct demolition so use of and access to occupied buildings will not be disrupted.

1. Provide not less than 7 days written notice to Owner's Representative of activities that will affect operations of adjacent occupied buildings.
2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.

a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from Owner and authorities having jurisdiction.

D. Long-term, onsite storage, or the sale of removed items or materials will not be permitted.
PART 2 - PRODUCTS  (Not Used)

PART 3 - EXECUTION

3.1 PROTECTION OF FACILITIES:

A. The Contractor is responsible for review of all surveys, utility provider records, Owner records, and COK records relative to the existing underground utilities. The Contractor is responsible for avoiding damage to these facilities and shall restore all damaged utilities at Contractor's own expense.

B. Ensure safe passage of persons and traffic around areas of demolition.

1. Provide flaggers and alternate routes around closed or obstructed traffic ways as required.
2. Provide and maintain temporary fences, barricades, guardrails, security devices, flashing lights, covered passageways and similar items as required to provide adequate protection against injury or damage to persons or property.
3. Provide barriers that physically prevent passage of pedestrians and vehicles into unsafe areas and excavations.

C. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated:

1. Protect adjacent buildings and facilities from damage due to demolition activities.
2. Protect existing site improvements, appurtenances, and landscaping to remain.
3. Provide tree protection per Section 01 56 39 – Tree, Plant and Soil Protection.
4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
5. Provide protection to ensure safe passage of people around demolition areas and to and from occupied portions of adjacent buildings and structures.
6. Protect walls, windows, roofs, and other adjacent exterior features that are to remain and that are exposed to demolition operations.
7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
8. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

D. Protect existing bench marks, monuments, control markers and other reference points. If disturbed, missing or destroyed, replace as directed at no additional cost to the Owner.

E. Preserve and protect existing trees and vegetation in accordance with Section 01 56 39 – Tree, Plant and Soil Protection and as shown on the Contract Documents.

F. Protect existing utilities, structures, fences, catch basins, utility services, sidewalks, paving, curbs, vegetation, trees and other items designated to remain from injury or damage due to Work of this Section.

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1. Restore existing facilities or features impacted during performance of the Work, by means and methods or damaged by construction activity to their original condition as acceptable to the Owner including, but not limited to landscaping, pavement, walks, channelization, structures, utilities, fences, trees and planters, at no additional cost to the Owner.
   
a. Coordinate with Survey of Existing Conditions requirements as described elsewhere in this section.

2. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and AHJs.
   
a. Cooperate with Owner’s Representative, utility companies, and COK for maintaining and protecting utilities that are to remain.

3. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and AHJs.
   
a. Provide at least ten business days’ notice to occupants of affected buildings if shutdown of service is required during changeover.

4. Provide (including design and permitting if required) interior and exterior shoring, bracing or support to prevent movement, settlement or collapse of adjacent facilities to remain. Comply with WISHA, WAC 296-155, and local codes and ordinances having jurisdiction.

5. Slope and/or shore the sides of excavations and trenches to comply with WISHA, WAC 296-155, and local codes and ordinances having jurisdiction. Maintain sides and slopes of excavations in a safe manner until backfilling is complete.

6. Conduct operations to prevent injury to persons, adjacent buildings, structures, areas, facilities, improvements and landscaping.

7. Maintain hauling routes clean and free of debris resulting from Work of this Project.

8. Protect Environmentally Critical Areas and ECA buffers from disturbance unless noted otherwise.

9. Underground power and communication distribution including but not limited to vaults, handholes, conduits and associated appurtenances to remain shall be protected unless authorized in writing by the Owner and AHJs.

10. Objectionable noises: limit use of air hammers and other noisy equipment. Conform with Local governing requirements regarding noise control.

11. Maintain vehicular and pedestrian safety routes:
   
a. Ensure minimum interference with roads, streets, alleys, sidewalks, bus zones and routes, and adjacent facilities.
   
b. Do not close or obstruct streets, fire lanes, sidewalks, bus stops, alleys or passageways without permission from AHJ.

3.2 DEMOLITION

A. Site Access and Temporary Controls: Conduct demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and AHJ. Provide alternate routes around closed or obstructed traffic ways if required by AHJ.

B. Below-Grade Demolition: Completely remove below-grade construction including concrete slabs and buried debris unless noted otherwise.

1. On the project record documents provide as-built information of the locations of below grade demolition.

C. Remove and dispose of pavement, slabs on grade, stairs, walls, structures, landscaping, rockeries, piping, and other obstructions with appurtenances where noted in the Contract Documents, where new improvements are to be constructed, and in areas to be cleared unless noted otherwise. All hardscape removals shall be accomplished by making a neat vertical saw cut at the limits of removal. All concrete walk, pavement, curb and gutter removals shall be sawcut at the next adjacent joint beyond the limits of demolition.

D. Leave existing concrete building pad in place per plans. Use jackhammer to break up concrete slab into sizes smaller than 6’ x 6’ to allow for air and water to get to the roots. Leave broken slab in place and cover per grading plans.

E. Remove and dispose of any rubbish or debris encountered as required to perform demolition and install proposed improvements.

F. Adjacent facilities designated to remain that are damaged by the Contractor’s operations shall be promptly repaired at no additional cost to the Owner.

G. Sprinkle excavated material and access roads as necessary to limit dust to the lowest practicable level. Do not use water to such an extent as to cause flooding, contaminated runoff, pollution or icing.

H. Open pits and holes caused by demolition Work shall be kept free of standing water.

I. Remove and properly dispose of offsite debris, unsuitables, and concrete rubble.

3.3 BACKFILLING AND GRADING

A. Backfill and compact with fill material as specified in Section 31 00 00 – Earthwork, areas excavated, open pits, trenches and holes caused as a result of demolition and removal of existing buried debris and foundations. Grade as required to meet adjacent grades and contours, unless noted otherwise, to provide surface flow to drainage structures, and to prevent ponding in building demolition areas and at existing trees to be protected.

B. Prior to placement of backfill materials, ensure that areas to be filled are free of standing water, frost, frozen material, debris, trash and organic matter.

C. Restore existing surfacing, unless indicated otherwise.

D. Backfill demolished utility excavations per 31 00 00 - Earthwork.
3.4 TREE/SHRUB SALVAGE

A. Contractor shall notify City of Kirkland staff two weeks prior to salvaging trees and shrubs for planting so that the City can prepare planting beds for transplanting.

B. The contractor shall dig out trees and shrubs as indicated on plans. Contractor shall keep soil intact below the dripline of the plant to a depth of 18 inches. Salvaged rootballs shall maintain as much soil as possible around their base.

C. If the City is not yet ready to transplant these materials, contractor shall heel in rootballs at a location identified with the City of Kirkland within the project limits of work.

D. Contractor may be responsible for protecting the salvaged plants for up to two weeks. During this time the rootballs should be placed close to one another, covered with mulch and watered at least twice daily to maintain soil moisture.

3.5 TREE REMOVAL

A. Remove trees as indicated in the Contract Documents. Removal operations shall be performed in a manner to protect property, adjacent features and structures to remain.

1. Grind stumps a minimum of 12 inches below final grade surface.
2. Completely remove all miscellaneous growth including but not limited to large roots and sucker shoots.
3. Protect all offsite trees along adjacent roadways and on surrounding properties.
4. Clear around trees designated to remain in accordance with Section 01 56 39 – Tree, Plant and Soil Protection."

3.6 PLAY EQUIPMENT REMOVAL

A. Remove and dispose of all existing play equipment as noted in the Contract Documents.

B. Remove and dispose all sub-surface elements from within the existing play area enclosure including play equipment foundations, drainage mats/piping, etc..

3.7 DISPOSAL

A. Legally dispose of demolished items and materials promptly.

B. Onsite storage or sale of removed items is prohibited.

C. The refuse resulting from demolition, stripping, clearing, grubbing and site preparation shall be disposed of by the Contractor in a manner consistent with all government regulations. In no case shall refuse material be left on the Project Site, shoved onto abutting private properties, or be buried in embankments or trenches on the Project Site. Debris shall not be deposited in any stream or body of water, in any public right-of-way, or upon any private property, except by written consent of the private property owner. Burning of materials in
these areas falls under the jurisdiction of the COK regulations, and is forbidden under all circumstances.

D. Completely remove demolished materials, debris, rubbish, trash, organic materials and other refuse items from site, and dispose of in a legal manner. Maintain hauling routes (including offsite) clean and free of debris resulting from the performance of Contract requirements. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas, or along route during offsite disposal.

E. Non-salvageable or non-recyclable demolition debris shall be transported to an approved lined landfill with a Leachate Collection System, and shall be subject to the COK’s material transfer tax.

F. Contaminated soils and creosote debris shall be transported to a permitted and licensed, lined landfill with a Leachate Collection System, and shall be subject to the COK’s material transfer tax.

3.8 RECYCLING AND REUSE ONSITE OF DEMOLISHED HARDSCAPES

A. Material recycled and reused onsite shall conform to the requirements for intended use per the Contract Documents.

3.9 CLEANING AND REPAIR

A. Clean adjacent structures, surfaces and improvements of dust, dirt and debris caused by Work of this Section and remove and dispose of debris in a legal manner.

B. Remove temporary Work and leave Project Site in clean and orderly condition.

C. Return adjacent areas to condition existing prior to start of Work of this Section and other Sections noted in Project Manual.

D. Promptly repair damages caused by Work as acceptable to the Owner at no additional cost to the Owner.

1. Repair damage caused to existing utilities and other improvements to remain.
2. Repair damage caused to trees designated to remain per Owner’s Representative, using ISA-certified Arborist. Pay for damaged trees that cannot be restored to full health and growth, as determined by the Owner’s Representative.
3. Use only materials in repairs that are of similar size, kind and quality as original materials, as acceptable to the Owner. Use only skilled labor, trained and experienced in the particular building trade, when performing repairs. When required to perform repair Work, use licensed personnel.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION:

A. Construct all formwork systems to provide only those lines and delineations indicated, unless otherwise approved by the Engineer, construct formwork to allow erection in proper sequence and to permit removal without damage to the finished concrete surfaces. Construct all formwork to the shapes, lines and dimensions of concrete members with specified tolerances. Include placement of Park Entry Sign letter molds.

1.2 RELATED SECTIONS

A. 03 20 00 – Concrete Reinforcement
B. 03 30 03 – Underslab Vapor Retarder
C. 03 35 13 – Concrete Floor and Architectural CIP Finishing

1.3 REGULATIONS:

A. Conform to requirements of the IBC and the Kirkland Building Code as it pertains to structural cast-in-place concrete, except as supplemented and modified herein.

1.4 REFERENCE STANDARDS:

A. Conform to requirements of the following Reference Standards as the Engineer judges them applicable and as modified and supplemented herein.

B. ACI Specifications for Structural Concrete for Buildings, ACI 301.
C. ACI Recommended Practice for Concrete Formwork, ACI 347.

1.5 QUALITY ASSURANCE:

A. Special Inspection: Notify the Engineer and Architect at least 48 hours before inspection of forms will be required.

B. Inspection by Other Trades: Where items, such as anchors, fastenings, conduit, piping and other items are supplied by other trades and specified elsewhere in these specifications, in the forms, obtain approval of their placement prior to placing any concrete.
C. Mock-up: Provide mock-up of concrete seat walls to demonstrate typical joints including skate block joint, surface finish including grind on top, form tie plugs, sandblast finish, texture, tolerance and standard of workmanship. Build minimum 15 lineal feet of seating wall in location as directed by Engineer. Approved mockups may become part of the completed Work if undisturbed at the time of Substantial Completion.

1.6 HANDLING:

A. Protection of Forms: Design, construct, and erect all forms for reuse; withdraw projecting nails or other objects from contact surfaces before reusing; clean and completely recondition all forms prior to reuse; repair any damage to forming surfaces caused during previous usage. Obtain approval by Engineer for each reuse; formwork with patches or repairs affecting appearance of the concrete surfaces will not be permitted.

B. In order that reused forms will not contain patches resulting from alterations, reuse forms on identical sections only; reuse no forms showing excessive surface wear or other imperfections impairing quality of finish of concrete surface.

C. Precautions: Contractor is responsible for the strength and suitability of the formwork.

PART 2 - PRODUCTS

2.1 FORMS:

A. Architectural Concrete Surfaces Exposed to View and Assembly Area Concrete Slabs: Use form facing material that will produce continuous, true and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

B. For Footings and Concrete Slabs: Fabricate forms of MDO plywood, metal or plastic as judged best suited for shapes. Construct with a minimum of joints, sufficiently tight to prevent leakage.

2.2 INSERTS/SLEEVES:

A. Coordinate with inserts and sleeves per the Drawings.

2.3 CHAMFER STRIPS:

A. Metal or dressed wood, 1/2 inch by 1/2 inch minimum; nonstaining; in longest practicable lengths.

2.4 FORM TIES

A. For Seat Walls Exposed to View: Factory-fabricated, threaded internal disconnecting type ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of
concrete on removal. Adjustable in length. Ties shall be designed as spreaders and be such a type that when removed no metal is left behind.

B. Furnish ties with tapered tie cone spreaders that, when removed, will leave holes 7/8th-inch diameter on concrete surface, suitable for installation of tie hole plugs.

2.5 FORM RELEASE AGENTS:

A. Release agent with non-staining and non-interference characteristic with bonding capabilities of paints, plasters, adhesives, other surface coatings or materials. Contractor shall guarantee proper bonding of such subsequent coatings or materials applied over concrete.

PART 3 - EXECUTION

3.1 DESIGN AND CONSTRUCTION:

A. Erect forms to conform accurately to the shapes, curves, dimensions, locations and profiles indicated; fit joints between adjacent assembled panels and components tightly and seal with gasket material. Verify compliance with dimensional tolerance of concrete slabs for art installation. Inspect all contact surfaces prior to concrete placement; verify that surfaces are clean, smooth, and free from foreign matter or imperfections affecting appearance of finished concrete.

B. Camber: Design and erect formwork for anticipated deflection due to weight and pressure of fresh concrete. Provide positive means for adjustment of shores and struts to take up settlement during placement.

C. Locate form ties to provide uniform layout across face of seat wall.

3.2 FORM TREATMENTS:

A. Before erection of forming, plug and seal all cracks, holes, slits, gaps and other "telegraphing" imperfections in contact surfaces. Apply bond-breaking coating in amounts that will leave surfaces in proper condition to receive subsequent material application. Contractor shall be responsible for being certain that bond release coatings are applied only in amounts that will leave surfaces in proper condition to receive subsequent material application.

3.3 FORM REMOVAL:

A. Formwork designed for easy removal without damaging or marring finished surfaces of the concrete. Prying against face of concrete will not be permitted; where mechanical means are necessary to release forms, use wood wedges only and then only if approved by the Engineer.
B. Removal Strength: Formwork for footings shall remain in place until concrete has hardened sufficiently to resist damage from the removal operations. Determine concrete removal strength based on test cylinders, field cured under the most unfavorable conditions prevailing for any portion of the work represented, or as approved by the Engineer.

END OF SECTION
SECTION 03 20 00
CONCRETE REINFORCEMENT

PART 1 - GENERAL

1.1 DESCRIPTION:
A. Section includes cast-in-place concrete reinforcement.

1.2 RELATED SECTIONS
A. Coordinate with related Work specified in other parts of the Project Manual.
B. Coordinate with the General Conditions and Supplemental Conditions in the Contract.

1.3 REGULATIONS:
A. Conform to requirement of the IBC and the Kirkland Building Code for concrete reinforcement, as supplemented and modified on drawings or herein.

1.4 REFERENCE STANDARDS:
A. Conform to requirements of the following Reference Standards as the Engineer judges them applicable and as modified and supplanted herein.
   1. American Concrete Institute (ACI) Building Code Requirements for Reinforced Concrete, ACI 318.
   2. ACI Specifications for Structural Concrete for Buildings, ACI 301.

1.5 QUALITY ASSURANCE:
A. Special Inspection: Notify the Engineer at least 48 hours before placing any concrete.

1.6 SUBMITTALS:
A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Product Data - Submit manufacturers' published literature for specified products and accessories as applicable, including manufacturers' specifications, physical characteristics and performance data. Submit as a supplement, manufacturers' instructions and directions for application if not included in manufacturers' published literature.
PART 2 - PRODUCTS

2.1 MATERIALS:

A. Bars: ASTM A615; types, sizes and grades as indicated and noted on drawings; all bars free from rust and loose scale at time of delivery.

B. Tie wire: 16-gauge double annealed wire. Provide galvanized tie wire for exposed concrete.

PART 3 - EXECUTION

3.1 FABRICATION AND DETAILING:

A. Fabricate steel bar reinforcement to shapes and dimensions as shown and placed as indicated.

B. Bending and Straightening: Form bars accurately to detail, other kinks or bends will not be permitted; conform to requirements of ACI 318. Make bends cold around pin with diameter at least 6 times bar dimension; heating of reinforcement will be permitted only if entire operation is approved. No bending of reinforcement after partial embedment in concrete will be permitted, except for Grade 40 dowels.

C. Splices: Obtain approval of all splices not indicated on drawings. In general avoid splices at points of maximum stress.

3.2 PLACEMENT:

A. Unless specified otherwise, all steel reinforcement shall be centered within the forms and approved by the Engineer prior to placement of concrete. No reinforcement shall be closer than 2” from any concrete surface.

B. Clean reinforcing bars free from loose rust, mud, oil and other foreign matter affecting or reducing bond using approved portable sandblasting equipment. Accurately position bars in accordance with approved placement drawings and secure against displacement. Lap at intersections as indicated or as directed; extend reinforcement through, and lap beyond, construction joints.

C. Displacement: If bars are displaced, or if it is necessary to move bars to avoid interference with other reinforcing or embedded items, and if bars are moved to exceed tolerances, obtain the Engineer’s approval of resulting arrangement prior to placing concrete.

D. Miscellaneous: After cutting tie-wire, turn wires to the inside of the section and bend in such manner that concrete placement will not force ends to exposed concrete surfaces.

END OF SECTION

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SECTION 03 30 00

CAST IN PLACE CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION:
   A. Section includes cast-in-place concrete including materials, mixture design, placement and curing for structural elements including but not limited to walls, stairs, foundations, pads, footings and associated work, and architectural cast-in-place countertops in restrooms.

1.2 RELATED SECTIONS
   A. 03 10 00 Concrete Formwork
   B. 03 35 00 Concrete Finishing
   C. Coordinate with related Work specified in other parts of the Project Manual.
   D. Coordinate with the General Conditions and Supplemental Conditions in the Contract.

1.3 REGULATIONS:
   A. Conform to requirements of the IBC and the Seattle Building Code as it pertains to structural cast-in-place concrete, except as supplemented and modified herein. The items of work to be performed shall include but are not necessarily limited to:
   B. Walls, stairs, foundation, concrete slabs, footings, pads, footings and associated work.

1.4 REFERENCE STANDARDS:
   A. Conform to requirements of the following Reference Standards or as modified and supplemented hereinafter:
      1. American Concrete Institute (ACI) Specifications for Structural Concrete for Buildings, ACI 301.
      2. ACI Recommended Practice for Selecting Proportions for Concrete, ACI 613.
      3. ACI Recommended practices for Cold Weather Concreting, ACI 306.
      4. ACI Recommended Practice for Hot Weather Concreting, ACI 605.

1.5 QUALITY ASSURANCE:
   A. Special Inspection: Inspection shall be required immediately prior to any intended pours or placement of concrete. Notify the Engineer at least 48 hours before inspection.
B. Concrete Work: Concrete work, where indicated, shall be exposed, as finished. Special care must be taken to provide specified, finished surfaces without gravel pockets, and other defacements.

1.6 SUBMITTALS:

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Shop Drawings: Submit, for approval, all layout drawings for all cast-in-place concrete work. Show joint locations and other pertinent information.

C. Records: Maintain records of all concrete placements; indicate exact mix proportions, list time, date, location in the project, weather conditions at the time of placement, and the source of the concrete supply. Make records available to Engineer at any time during the course of construction and submit at end of concrete placement phase of project for the purposes of preparing record documents.

D. Certificates: Submit certification of previously tested mix designs.

E. Sample / Mock-up of Cast-in-place countertop:

1. 1-foot by 1-foot sample / mock-up of cast concrete countertop.

PART 2 - PRODUCTS

2.1 CONCRETE MATERIALS:

A. Aggregates: Standard: ASTM C33-86.

B. Cements:

1. Provide cements obtained from same source or of same brand for concrete in same element or portion of the work.

C. Cementious Materials: Fly ash, ASTM C618 type F, except that the maximum allowable loss on ignition shall be 0.75%. Use for all concrete.

D. Admixtures:

1. Use only one brand of admixtures.
2. Water-Reducing Admixture: Master Builders Pozzolith 300-N. Chemical admixture conforming to requirements of ASTM C494-86, Type A.
3. Retarder-Densifying Admixture: Master Builders Retarding Pozzolith, or approved equal: Conforming to requirements of ASTM C494-86, Type B.
4. Accelerator: Chemical admixture designed to accelerate set on concrete but not corrode reinforcing steel; ASTM C494-86, Type C.
5. Air Entraining Agent: Conforming to requirements of ASTM C260-86.

E. Other Ingredients: Provide other ingredients as indicated or as required by Code or Reference Standards.

2.2 CONCRETE MIXES -GENERAL:

A. Quality of Concrete: Assumed compressive strengths and locations of same are noted on drawings and specifications.

B. 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 (ACI 301M).

C. Admixtures:
   1. Add in accordance with manufacturer's directions.
   2. If approved, water-reducing retardant may be used when the temperature of the concrete, as placed, exceeds 65 degrees F.
   3. If approved, accelerator may be used when temperature of concrete is less than 40 degrees F.
   4. No calcium chloride or other water-soluble chloride ion admixtures will be permitted, unless otherwise approved by Engineer.
   5. Use retarder/densifier when placing other concrete in warm weather conditions or when ambient temperature exceeds 65 degrees F.
   6. Use air-entraining agent in concrete only if subjected to freezing temperatures after curing. The fly ash content shall not exceed 7% by weight of the total cementious material, unless noted otherwise on drawings.
   7. Total air content shall be in accordance with Structural General Notes on plans.
   8. Standard Concrete - Ready-Mixed Concrete: Mix and transport in accordance with ASTM C94-09.

2.3 CONCRETE MIX

A. With the exception of structural concrete shown on Structural Documents, concrete mix shall have characteristics as follows:

B. 28 day compressive strength 3000, psi
   Sacks Cement (5) per CY - (see "Cement", below)
   Fine Aggregate (Type 1) (291 lbs.) per Sack. - (see "Aggregates", below)
   Coarse Aggregate (Type 5) (387 lbs.) per Sack, - (see "Aggregates", below)
   Max. Water (6.5 bags) per Sack
   Slump (inches) (2 - 3.5) per ASTM C143-78

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2.4 **PORTLAND CEMENT:**

A. Use only Type II Portland Cement, as specified in City of Seattle Standard Specifications (most recent edition), and AASHTO M 85.

2.5 **AGGREGATES:**

A. **Fine Aggregates:** Fine Aggregates shall consist of sand or other inert materials, or combinations thereof, having hard, strong, durable particles free from an adherent coating. Fine Aggregate shall be washed thoroughly to remove clay, loam, alkali, organic matter, or other deleterious matter. Mineral Aggregate Type 1, particle gradation is as follows:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
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<tbody>
<tr>
<td>#4</td>
<td>95 - 100</td>
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<tr>
<td>#8</td>
<td>68 - 86</td>
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<td>#50</td>
<td>9 – 20</td>
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<tr>
<td>#100</td>
<td>0 – 7</td>
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<tr>
<td>#200 (wet)</td>
<td>0 - 2</td>
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</tbody>
</table>

B. **Coarse Aggregates:** Coarse Aggregate shall consist of gravel, crushed stone, or other inert material or combination thereof having hard, strong, and durable pieces free from adherent coatings. Coarse Aggregate shall be washed to thoroughly remove clay, silt, bark, sticks, alkali, organic matter, or other deleterious material. Coarse Aggregate particle gradation is as follows:

<table>
<thead>
<tr>
<th>Sieve Size</th>
<th>% Passing</th>
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<tbody>
<tr>
<td>1-1/2” Square</td>
<td>100</td>
</tr>
<tr>
<td>3/4” Square</td>
<td>80 - 100</td>
</tr>
<tr>
<td>3/8” Square</td>
<td>10 - 40</td>
</tr>
<tr>
<td>#4</td>
<td>0 - 4</td>
</tr>
<tr>
<td>#200</td>
<td>0 - 0.5</td>
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</tbody>
</table>

2.6 **BONDING AGENTS AND ADHESIVES:**

A. Bonding Agents as required.

B. Primers and Sealers: As recommended by the adhesive and bonding agent manufacturers.
2.7 EXPANSION JOINTS IN SLABS:


PART 3 - EXECUTION

3.1 CONCRETE PLACEMENT:

A. Inspection: Before placing concrete, inspect and complete any unfinished formwork, reinforcing steel, and items to be embedded or cast in. Notify other trades to permit installation of their work. Contact City of Kirkland engineer to make arrangements for inspection

B. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete", and as specified.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened sufficiently to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation at its final location.

D. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

   1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete complying with ACI 309.

   2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the machine. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix to segregate.

   3. Place and consolidate concrete around entry sign text mold to insure crisp outline of text. See 03 10 00 -2.06 – Concrete Formwork.

E. Cold Weather Placement: Comply with provisions of ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing action, or low temperatures.

F. When air temperature has fallen to or is expected to fall below, 40 degrees F (4 degrees C), uniformly heat water and aggregates before mixing, to obtain a concrete mixture temperature of not less than 50 degrees F (10 degrees C) and not more than 80 degrees F (27 degrees C), at point of placement.

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1. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen sub-grade or on sub-grade containing frozen materials.
2. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise accepted in mix designs.

G. Hot Weather Placement: When hot weather conditions exist that would impair quality and strength of concrete, place concrete complying with ACI 305 and as specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement to below 90 degrees F (32 deg C). Mixing water may be chilled or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover reinforcing steel with water soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedding in concrete.
3. Fog spray forms, reinforcing steel, and sub-grade just before placing concrete. Keep sub-grade moisture uniform without puddles or dry areas.
4. Use water reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions, as acceptable to the Engineer.

3.2 CONSTRUCTION JOINTS:

A. Form all joints perpendicular to main reinforcement. Continue reinforcing across joints, unless otherwise indicated; provide longitudinal keys at least 1-1/2 inch deep at all joints in walls between walls and slabs or footings. Remove key forming wood inserts and thoroughly clean surface of concrete at all joints before placing next lift.

B. Roughen surface of concrete at joints and remove laitance to obtain bond before placing next lift; if use of keys is impractical due to congestion or inaccessibility or if it is inadvisable to disturb surface before it has hardened, use only wet sandblast method for preparing surface.

C. Dampen hardened concrete of joints between footings and walls, joints in unexposed walls, and all others not specifically mentioned here in after and roughen by air water cutting.

D. Dampen hardened concrete joints in exposed work and roughens by air/water cutting. Thoroughly cover joint surfaces with neat cement mortar of similar proportions to mortar in concrete; apply mortar as thick as practicable on vertical surfaces and a minimum of 1/2 inch thick on horizontal surfaces; place next lift before mortar has reached its initial set.

E. For bonding new concrete to existing concrete use bonding agent. For grouting dowels and reinforcing bars use specified adhesives in accordance with manufacturer's instructions.

F. Provide key forming wood inserts strips in walls; pour concrete to 1/2 inch above lower edge or strip.
3.3 **ISOLATION/EXPANSION JOINTS:**

A. Provide pre-molded 3/8 inch joint filler for expansion joints abutting concrete curbs, catch basins, manholes, inlets, structures, walks and other fixed objects, unless otherwise indicated.

B. Locate expansion joints as noted on drawings.

C. Extend joint fillers full width and depth of joint and not less than 1/2 inch or more than 1 inch below finished surface where joint sealer is indicated. Furnish joint fillers in one-piece lengths for full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Protect top edge of joint filler during concrete placement with a metal or plastic temporary strip. Remove protection after concrete has been placed on both sides of joint before sealant is applied.

D. Fillers and Sealants: Install polyurethane sealant in a continuous, smooth joint, wiping excess sealant from adjacent concrete.

E. Provide expansion joints not more than 30 feet apart in footings. Run no reinforcement or other metal trim continuously through joints, unless otherwise indicated.

3.4 **NON-SHRINKING GROUT:**

A. Apply in accordance with manufacturer's direction; protect adjacent finished surfaces from defacement. Provide for sleeves, and where indicated.

3.5 **CLEANING:**

A. Leave premises completely clean and free of residue from work of this section.

3.6 **AS-CAST FORMED CONCRETE COUNTERTOPS: RESTROOMS**

A. Smooth-Formed Finish: As-cast concrete texture by form-facing material, arranged in a monolithic and symmetrical manner. Reinforcing to be #3 bars, see architectural drawings for reinforcing layout.

B. Formwork to be reviewed by architect prior to casting mock-up and final countertops. Countertops to be cast upside down, with finish face and sides cast to form facing material. Holes for countertop lavatories to be formed into the slab casting, not cut. Caulk all joints at right angles prior to placing concrete. Allow to dry thoroughly. Vibrate formwork during the placement process. Screed and hand trowel bottom of slab. Remove fins and other projections on formed-surface irregularities. Repair and patch defects in method demonstrated in accepted Mock-up.

**END OF SECTION**
PART 1 - GENERAL

1.1 SECTION INCLUDES
  A. Under slab vapor retardant sheeting at interior slabs on grade.
  B. Taped seams and openings.

1.2 RELATED REQUIREMENTS
  A. 03 30 00 - Cast-in-Place Concrete.
  B. Divisions 20 and 30 Facility Services Subgroup: plumbing and electrical penetrations.
  C. Division 30 Sections on Earthwork, Excavation and Backfill.

1.3 ADMINISTRATIVE REQUIREMENTS
  A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section 01 30 00 – Administrative Requirements.
     1. Review preparation and installation procedures and coordinating and scheduling required with related work.
  B. Coordinate penetrations through vapor retarder.
  C. Select screeds and other concrete work accessories to ensure no penetration of the vapor retarder during concrete work.

1.4 SUBMITTALS
  A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
  B. Qualification Data: For Manufacturer, design engineer, fabricator, and installer.
  C. Delegated-Design Submittal: For assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  D. Product Data: Published descriptive literature for vapor retarder and patching materials.
E. Shop Drawings: Indicate required flashings, sealing at openings.

F. Sample: 12 inch x 12 inch.

G. Certified Test Data: Include manufacturer's test data results, certified in writing from independent testing agency.

H. Manufacturer Instructions: Installation instructions, special procedures, and perimeter, penetration and other conditions requiring special attention. Include limitations.

I. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

J. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
   3. Recommended schedule of maintenance.

K. Closeout Submittals:

1.5 MAINTENANCE MATERIAL
   A. Spare parts, extra stock, tools.

1.6 QUALITY ASSURANCE

   B. Do not install sand layer or any other material over vapor retarder prior to placement of concrete slab-on-grade.

1.7 DELIVERY, STORAGE, AND HANDLING
   A. Take precautions to prevent puncturing and tearing vapor retarder.

1.8 WARRANTY
   A. Installation Warranty: Contractor shall correct defective Work within a 2 year period after Date of Substantial Completion.

PART 2 - PRODUCTS

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2.1 DESCRIPTION

A. Class A, sheet vapor retarder in accordance with ASTM E 1745. Moisture Vapor Permeance: 0.01 perms. Thickness: 15 mils minimum.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Thickness: 15 mil minimum

B. ASTM E 1745, Class A, sheet vapor retarder.

C. Moisture Vapor Permeance: 0.01 perms when tested to ASTM E 154, after mandatory conditioning tests per sections 8, 11, 12, and 13

D. Puncture Resistance: Minimum 2200 grams, tested to ASTM D 1709 Method B.

E. Tensile Strength: 45 foot-pounds per inch, tested to ASTM E 154, Section 9, Method ASTM D 882.

F. Initial Tear Resistance: Minimum 8.0 pounds force in machine direction and transverse direction, tested to ASTM D 1004.

G. Low Temperature Impact: Pass minus 120 degrees C, tested to ASTM D 1790.

2.3 MANUFACTURERS


B. Stego Industries LLC; Stego Wrap; www.stegoindustries.com


D. Specification is based on products listed below by manufacturer.

1. Substitutions for products by other manufacturers: See Section 01 60 00 - Product Requirements.

2.4 MATERIALS

A. VAPOR RETARDER

1. Basis of Design Product: Stego Wrap by Stego. Comparable and substituted products will be judged based on the following performance criteria, features, warranty, and qualifications.

2. Features:

   a. Forest Certification: For the following wood products, provide materials produced from wood complying with FSC STD-01-001, FSC Principles and Criteria for Forest Stewardship.
b. Recycled Content: (and other sustainability things pertaining to material 1 and not other materials.)

c. of the product, thickness, weight, (used to list what features are important to the design).

d. Profile: To be selected from manufacturer's full range.

e. Finish: To be selected from manufacturer's full range.

1) Color: To be selected from manufacturer's full range.

2.5 ACCESSORIES

A. Pressure Sensitive Tape: As instructed by manufacturer.

B. Seam Splice Tape Primer: As instructed by manufacturer.

C. Other Accessories: As instructed by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify installation conditions as satisfactory to receive work of this Section before beginning.

B. Verify subgrade free from conditions that may cause puncture or other damage to vapor retarder.

3.2 PREPARATION

A. Complete substrate work before beginning work of this Section.

1. Compacted Structural Fill per structural notes and Division 31. Level, tamp or roll as necessary for smooth level surface prior to installation of vapor retarder.

2. Through-Slab Penetrations: Ensure that drain lines, electrical conduit and other utilities of Division 15 thru Division 16 are in place and firmly anchored.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions, and ASTM E 1643

B. Interior Concrete Slabs-On Grade: Provide vapor retarder where indicated on drawings.

C. Install vapor retarder sheet over compacted base.

D. Roll down vapor retarder in widest practical width, parallel with direction of concrete pour, and with minimum number of joints.

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E. Lap vapor retarder over footings and seal with pressure sensitive tape to foundation wall.

F. Overlap joints 6 inches minimum and seal with pressure sensitive tape.

G. Promptly patch tears and punctures as they occur.

H. Repair damaged areas by cutting vapor retarder as patches. Overlap tears and holes 6 inches beyond damaged area with patches. Seal patch to installed vapor retarder with pressure sensitive tape or as instructed by manufacturer.

I. Seal pipe penetrations and other openings through concrete slab with vapor retarder or factory fabricated boots and pressure sensitive tape. Field fabricate boots and other shapes as necessary to seal vapor retarder against vapor penetration.

J. Place concrete slab-on-grade directly over installed vapor retarder under work of Section 03 30 00. Do not install granular fill layer over vapor retarder.

3.4 FIELD QUALITY CONTROL

A. Inspect completed installation prior to placing concrete slab-on-grade in accordance with Section 01 40 00.

B. Verify vapor retarder installed in accordance with manufacturer’s instructions with permanent penetrations taped and sealed.

C. Verify that vapor retarder has not been penetrated by screed stakes and that base set screed posts are in place.

3.5 ADJUSTING

A. Patch penetrations with pressure sensitive tape and make adjustments as necessary to maintain performance of vapor retarder as instructed by manufacturer.

B. Do not patch or seam when vapor retarder is wet.

3.6 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

3.7 PROTECTION

A. Protect From Penetration: Do not permit use of ground set stakes, screed posts, and other items to puncture vapor retarder. Where punctured, remove penetrating item and patch vapor retarder, as specified in this section, before placing concrete.
B. Lay plywood or other protection board over installed vapor retarder at areas of heavy traffic and other construction loads. Do not stack construction materials directly on vapor retarder.

3.8 SCHEDULE

A. Locations: All slab on grade locations over sand and engineered fill as indicated.

END OF SECTION
SECTION 03 35 13

CONCRETE FLOOR AND ARCHITECTURAL CIP FINISHING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Finishing slabs on grade and monolithic floor slabs.
   1. This section further defines the use of finishes of both formed and unformed surfaces specified in Section 03 30 00, it does not replace those requirements.
   2. The floor flatness and levelness recommendations of ACI 302.1R referenced below, are written for slabs on grade and supported slabs at the time of initial concrete placement and finishing. This specification requires achievement of floor flatness and levelness at the time of application of final floor covering.

B. Surface treatment with sealer at areas not receiving a polished finish.

C. Concrete formwork for Textured Architectural Concrete (aka Board Formed).

1.2 RELATED REQUIREMENTS

A. 03 20 00 – Concrete Reinforcement

B. 03 30 00 – Cast-in-Place Concrete

C. 03 30 03 – Underslab Vapor Retarder

D. 07 90 05 – Joint Sealers.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with 01 30 00 – Administrative Requirements.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

B. Coordinate the work with concrete floor placement and concrete floor curing.

1.4 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Product Data: Provide data on sealer and other manufactured products, including information on compatibility of different products and limitations.

C. Map and Test Data: Provide floor flatness and levelness measurements and test locations.

D. Maintenance Data: Provide data on maintenance renewal of applied coatings.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's sealed packaging, including application instructions.

1.6 FIELD CONDITIONS

A. Maintain light level equivalent to minimum 200 W light source, placed 8 feet above the floor surface, for each 425 square foot of floor being finished.

1.7 WARRANTY

A. Installation Warranty: Contractor shall correct defective Work within a 2-year period after Date of Substantial Completion.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Concrete Floor Flatness: Measure for F(F) and F(L) tolerances for floors in accordance with ASTM E 1155.

2.2 ARCHITECTURAL CONCRETE FORMWORK

A. Smooth Architectural Concrete:

   1. High Density Overlaid panel or other approved non-absorptive panel materials that will provide continuous, true, and smooth Architectural concrete surfaces.

      a. Furnish in largest practicable sizes to minimize number of joints
      b. New or very clean - no scratches or indentations or other scars allowed.

B. Textured Architectural Concrete (aka Board Formed):

   1. Vertical concrete forms to reference the American Concrete Institute, ACI 347 Guide to Formwork for Concrete (current edition).

   2. Lumber Forms
2.3 COMPOUNDS - HARDENERS AND CLEALERS

A. Chemical Sealer-Hardner:

1. Concrete Floor Sealer/Finish: Liquid chemical hardener; silicate type. Subject to compliance with requirements, provide products by one of the following:

   a. Curecrete Chemical, "Ashford Formula" (enhanced silicate, not silicate).
   b. L & M Chemical, "Seal Hard."
   c. Euclid Chemical "Diamond Hard".
   d. Dayton Superior "Day-Chem Sure Hard J-17".

B. Dustproofer:

1. Penetrating Liquid Dustproofer: Clear, chemically reactive, waterborne solution of materials and proprietary components; odorless; colorless; that penetrates, densifies and dustproofs concrete surfaces. Provide products manufactured by one of the following, or approved:

   a. Dayton Superior Corporation.
   b. Euclid Chemical Company.
   c. L&M Construction Chemicals, Inc.

C. Concrete Cleaner:

1. Liquid concentrate, biodegradable, heavy-duty cleaner-degreaser compound.

D. Substitutions: See Section 01 60 00 - Product Requirements.

2.4 CONCRETE SEALER AT INTERIOR FLOORS, RESTROOM CONCRETE COUNTERS, PAVILION PORTALS, CONCRETE PREP TABLE

A. Acceptable Product: Dayton Superior, Sure Hard (J-17) or other reviewed and accepted.

B. Local Manufacturer's Representative: Steve Hackworth, Email: stevehackworth@daytonsuperior.com; Local Distributor: Industrial Coatings & Sealants, Inc., Tel. (253) 872-4411 x-56105; Cell. (253)-245-0263; www.coatingsandsealants.com; Contact: Greg Tadie.

C. Penetrating water-based liquid sealer with hardener and dustproofing properties. Sealer shall be non-yellowing.
1. VOC: 0 g/L
2. Depth of penetration: 5 mm (.20 inch) into concrete.
3. Water Absorption: ASTM C-642, 3.4% in 24 hours.
4. Water Vapor Transmission Rate: 217 grams/sf - 24 hours

D. Sheen: Satin sheen as established with Architect reviewed and accepted Mock-ups. The treated surface will develop an increased polished appearance over time.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that floor surfaces are acceptable to receive the work of this section.

3.2 CAST-IN-PLACE ARCHITECTURAL FINISH

A. Reduce all tolerances to 1/2 of the permitted tolerance of ACI 117.

3.3 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301, ACI 302.1R, and ACI 117.
B. Steel trowel surfaces that are scheduled to be left exposed, unless otherwise noted.
C. Light broom finish surfaces left exposed, as noted these specifications.
D. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at 1/8 inch per foot nominal.
E. In areas with floor drains and in areas indicated on drawings slope surfaces uniformly to drains.
   1. Floors not so indicated, are to be finished flat and level.

3.4 FLOOR SURFACE TREATMENT

A. Apply hardener to scheduled floor surfaces in accordance with manufacturer's instructions.
B. Apply slip resistant finish to scheduled floor surfaces in accordance with manufacturer's instructions.
C. Apply sealer to floor surfaces in accordance with manufacturer's instructions.
D. Apply retarder to exposed aggregate floor surfaces, as scheduled, in accordance with manufacturer's instructions.
3.5 FLOOR TOLERANCES

A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for flatness.

B. Measure flatness of slabs in accordance with ACI 302.1R and to achieve the following tolerances.

C. Finish concrete to achieve the following tolerances:
   1. Maximum Variation of Surface Flatness For Exposed Concrete Floors: 1/4 inch in 10 ft.

D. Measure for F(F) and F(L) tolerances for floors in accordance with ASTM E 1155 and ACI 117. Measurement at the time of initial finish is optional for above grade slabs and required for on grade slabs.
   1. The F(f) and F(L) requirements of this specification are for final floor finish and are not optional for any slabs.

E. Finish concrete either during initial finishing or prior to final floor finish application to achieve the following tolerances:
   1. Building:
      a. Polished Concrete Floors: Ff 55 (40 local) and Fl 55 (40 local).
      b. Exposed to View and Foot Traffic: Ff 35 (25 local) and Fl 25 (17 local).

F. Finish at sloped floors; flatness as indicated above for the finish flooring; slope as indicated on drawings. Minimum of 1/8 inch per foot if not indicated.

3.6 DEFECTIVE CONCRETE

A. Definition: Concrete not conforming to required lines, details, dimensions, flatness, tolerances or specified requirements.

B. Test Results: The testing agency shall report test results in writing to Consultant and Contractor within 24 hours of test.

C. Repair or replacement of defective concrete will be determined by the Consultant. The cost of additional testing or replacement of concrete shall be borne by Contractor when defective concrete is identified.

D. Correct the slab surface if tolerances are less than specified.
   1. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.
E. Do not patch, fill, touch-up, repair, or replace concrete to be left exposed except upon express direction of Consultant for each individual area.

F. Architectural Concrete may not be patched

3.7 MISCELLANEOUS PENETRATIONS

A. Pipe and ducts not formed into the concrete by their placement or by the use of void forms must have any gap between the item and the concrete filled with non-shrink grout. If the penetration passes through an exterior wall exposed to drainage and/or weather, the exposed area must be waterproofed and sealed to insure against leakage.

3.8 FINISH DEFINITION

A. Finish concrete floor surfaces in accordance with Standards listed in References above.

1. Floor finish noted below, and floor levelness or flatness noted above are not necessarily related.

B. Light Broom Finish applied with a stiff broom lightly applied to the concrete to providing a non-slip surface with a lighter texture.

C. Full Steel Trowel Finish: Tolerance for these floors as noted above.

D. Sealer Finish:

1. After finishing operations (trowel finish or broom finish) are complete, precast panels have been lifted into place, and slabs are ready for final treatment, thoroughly clean surface to remove curing membrane and other residue and apply concrete floor sealer.
2. Location: At all interior, exposed slabs subject to pedestrian traffic, unless indicated otherwise.

E. Architectural Formed Finish: Light Sandblast per ACI 303R and approved in field.

3.9 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project’s Waste Management Plan.

3.10 APPLICATION OF CONCRETE SEALER

A. Refer to 07 19 00 – Water Repellents for penetrating water repellent for interior and exterior concrete walkways.
B. Apply in accordance with manufacturer’s installation instructions.

C. Concrete must be allowed to cure a minimum of 7 days prior to application of liquid sealer.

D. Exposed architectural concrete floors indicated to be hard troweled that have not achieved acceptable levelness and smoothness tolerances will require the additional step of polishing with diamond polishing discs until acceptable levelness and smoothness of floor has been achieved.

E. All surfaces to be treated must be clean and sound. Remove all membrane forming curing compounds, sealers, oil, grease, dirt and other contaminants. For best results, remove any concrete laitance and patch or fix all cracks and damaged areas in method acceptable to Architect.

F. Floor should be cleaned and allowed to dry.

G. Apply sealer with low-pressure spray equipment at application rate recommended by manufacturer. The floor should be completely saturated with material. Normally this will require a 1st coat application at the rate of 200 square feet per gallon. The application rate may vary due to the porosity of the floor. More porous floors will require additional material.

H. After applying, the material shall be continuously worked with a floor scrubber with manufacturer recommended pads for 15-20 minutes or until the material begins to gel. The use of a mechanical scrubber will increase the effectiveness of the application. The floor must be kept wet with material while the scrubbing process is proceeding.

I. If a second coat is required, immediately apply it in a same manner as the first coat. Do not allow the surfaces treated to dry between applications.

J. After scrubbing is completed, all excess material on the surface should be thoroughly flushed from the floor.

3.11 SCHEDULE


END OF SECTION
SECTION 03 35 00
CONCRETE FINISHING

PART 1 - GENERAL

1.1 DESCRIPTION
A. Section includes cast-in-place concrete finishes.

1.01 RELATED SECTIONS
A. Coordinate with related Work specified in other parts of the Project Manual.
B. Coordinate with the General Conditions and Supplemental Conditions in the Contract.

1.2 REFERENCE STANDARDS:
A. Conform to requirements of the following Reference Standards or as modified and supplemented hereinafter.
   1. ACI Specifications for Structural Concrete for Buildings, ACI 301.
   2. ACI Recommended Practice for Cold Weather Concreting, ACI 306.
   3. ACI Recommended Practice for Hot Weather Concreting, ACI 605.

1.3 QUALITY ASSURANCE:
A. Concrete Work: Concrete work, where indicated to be exposed, is architecturally finished concrete. Special care must be taken to provide specified, finished surfaces without gravel pockets, and other defacements. The Engineer shall inspect concrete after removal of forms and before concrete repair work begins.

1.4 PROTECTION:
A. Protect persons and adjacent materials and finishes from dust, dirt and other surface or physical damage during finishing operations, including materials driven by wind.

PART 2 - PRODUCTS

2.1 FORM TIE HOLE PLUGS:
A. Precast concrete plugs provided by manufacturer of Form Tie System, sized as required for tie holes or approved equal. Manufacturer's recommended adhesive.
2.2 ANTI-GRAFFITI COATING

A. Manufacturers: basis of design: Sherwin Williams pro-industrial anti-graffiti coating, clear semi-gloss finish – non-stick surface or approved equal.

PART 3 - EXECUTION

3.1 REPAIRS:

A. Immediately after removal of forms and inspect all surfaces for defects. Repair or patch defects only after defects are inspected by the Engineer and then only with the Engineer’s permission. Do all cutting and repair within 48 hours after removal of forms; cure repairs same as new concrete.

B. Defective Areas: Where patches are allowed, repair and patch areas; must match the surrounding areas in color and texture so as to be indistinguishable after completion, including curing and finishing. Determine mix for color by trial mixes before patching; after initial cure, dress patch or repair area mechanically or by hand for texture match.

3.2 FINISHES FOR FORMED SURFACES:

A. Architectural Concrete Formed Finish for all surfaces exposed to view: Provide a smooth formed finish on formed concrete surfaces exposed to view. This is an as-cast concrete surface obtained with selected form facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Remove fins and other projections completely and smoothed.

1. Maintain uniformity of special finishes over construction joints, unless otherwise indicated.
2. Plug ties holes in vertical concrete with recessed cementitious plugs
3. Sacking of Architectural Concrete is not allowed.

B. Provide light sandblast finish on wall, stair and light pole footing surfaces.

3.3 ANTI-GRAFFITI COATING

A. Apply 2 coats to all exposed walls per manufacturer’s recommendations.

3.4 CURING:

A. Protect freshly deposited concrete from premature drying and excessively hot or cold temperatures; maintain minimal moisture loss at relatively constant temperature for necessary hydration time and proper relatively constant temperature for necessary hydration time and proper hardening of concrete.

B. Duration of Curing: In addition to the initial overnight curing, continue final curing operations until the cumulative number of days or fractions thereof (not necessarily

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consecutive) occurs, during which time the temperature of the air in contact with the concrete is above 50 degrees F, equals 7 days. If high-early strength concrete has been used, continue final curing operation for 3 days total time, calculated as before. Take care to prevent rapid drying at the end of the curing period. If early removal of forms is approved and forms are removed during the curing period, apply one of the curing methods specified in City of Seattle Standards Specifications (most recent edition), and continue curing for the remainder of the required curing period.

3.5 CLEANING:

A. Leave the premises completely clean and free of residue from the work of this section.

END OF SECTION
SECTION 04 20 00
UNIT MASONRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Concrete Masonry Units (CMU).
B. Installation Materials.

1.2 RELATED REQUIREMENTS

A. 07 19 00 – Water Repellents
B. 07 21 00 - Thermal Insulation
C. 07 25 00 - Weather Barriers
D. 07 62 00 - Sheet Metal Flashing and Trim
E. 07 90 05 - Joint Sealers

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with 01 31 20 – Project Meetings.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.4 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Qualification Data: For installer.
C. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
   1. Include material properties and test reports substantiating compliance with project requirements.
   2. Size Variation Data: For masonry units.
   4. Durability: In accordance with ASTM C67; 50 cycles of freezing and thawing.
   5. Strength: provide data and calculations establishing average net-area compressive strength for masonry units used in structural assemblies.

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6. Steel reinforcing bars.
7. Joint reinforcement.
8. Anchors, ties, and metal accessories.
9. Cementitious Materials include:
   a. Brand, type, and name of manufacturer.
   b. Description of mix design and proportions of ingredients.
10. Glazed face masonry unit product data.

D. Shop Drawings: Indicate required flashings, control joints, and expansion joints, sealing at openings, projections, and penetrations.
1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
3. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.
4. Detail Drawings: Submit elevation or overall drawings at 1/2 inch equal to 1 foot scale and detail drawings of a minimum 1-1/2 inch equal to 1 foot scale showing:
   a. Bar splice locations.
   b. Wall elevations exposed to view indicating the location of all cut masonry products.
   c. Location and diagrams of all bent bars.
   d. Wall dimensions, bar clearances, and all openings greater than one masonry unit in area.

E. Samples, submit the following:
1. Full glazed face masonry unit to illustrate range of color and texture.
2. Mortar.

F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods for cementitious materials and accessories.

G. Maintenance Data: For users operation and maintenance of system including:
1. Methods for maintaining system's materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle material to avoid chipping, breakage, and contact with soil or contaminating materials.

B. Store masonry units in accordance with ASTM C90.

C. Store moisture sensitive materials in dry, weathertight enclosures.
1.7 ENVIRONMENTAL CONDITIONS

A. General: Conform to ACI 530/530.1 for hot and cold weather masonry construction.

B. Hot Weather:
   1. Take the following precautions if masonry is erected when:
      a. The ambient air temperature is more than 99 degrees F. (37 degrees C.) in the shade and the relative humidity is less than 50 percent.
      b. The ambient air temperature exceeds 90 degrees F. (30 degrees C.) and the wind velocity is more than 8 mph (13 km).
   2. Shade masonry materials from direct sunlight; spread mortar beds no more than 4 feet ahead of masonry; set masonry units within one minute of spreading mortar; and after erection, protect masonry from direct exposure to wind and sun for 48 hours.

C. Cold Weather:
   1. Take the following precautions if masonry is erected when:
      a. Ambient temperature or mean daily air temperature falls below 40 degrees F. (4 degrees C.)
      b. Temperature of masonry units is below 40 degrees F. (4 degrees C.)
   2. Provide supplemental heat to achieve required ambient temperature of air and materials.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Interior and Exterior assemblies of concrete and Concrete Masonry Units (CMU) and installation materials.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Follow details and specifications for size, layout, and grouting of structural unit masonry walls. Coordinate net-area compressive strength requirements with Engineer.
   1. Determine net-area compressive strength as follows:
      a. Unit Strength Method: Compressive strength of units and mortar per Tables 1 and 2 in ACI 530.1 / ASCE 6 / TMS 602.
      b. Prism Method: Test masonry prisms in accordance with ASTM C 1314

B. Obtain cementious materials from a single manufacturer for each type used.

2.3 MANUFACTURERS

A. Astra-Glaze-SW+ as manufactured by Trenwyth (basis of design).
B. Spectra-Glaze II as manufactured by The Burns & Russell Company
1. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.

2.4 GLAZED CONCRETE MASONRY UNITS (GCMU)

A. Complying with ASTM C652.

B. Compressive strength for each type of unit required per ASTM C 140.

C. Aggregates: Lightweight aggregates and blends of lightweight and heavier aggregates in proportions used in producing the units that comply with the following requirements when tested for stain-producing iron compounds in accordance with ASTM C641:
   1. By visual classification method, the iron stain deposited on the filter paper shall not exceed the “light stain” classification.

D. Slag: Comply with ASTM C989 per project requirements.

E. Cement: Low alkali content.

F. Unit Sizes: As indicated.
   1. Standard units are nominally 2, 4, 6, 8, 10, and 12 inch thick by 8 inches tall x 16 inches long.
   2. Shapes:
      a. Stretcher: Provide Astra-Glaze-SW+ stretch where indicated on Drawings. Color to match standard glazed units.
      b. Open Ended Bond Beams: Provide Astra-Glaze-SW+ open ended bond beams where indicated on Drawings. Color to match standard glazed units.
      d. Jamb: Provide Astra-Glaze-SW+ jamb as needed. Color to match standard glazed units.
      e. Other shapes as necessary and as identified on the drawings including, but not limited to: Glazed cap profile.

G. Glazing Colors:
   1. Pastel Blue as manufactured by Astra-Glaze, Basis of Design.

2.5 CEMENTITIOUS MATERIALS

A. Portland Cement: Complying with ASTM C150.

B. Masonry Cement: Complying with ASTM C91.

C. Sand: Complying with ASTM C144.

D. Water: Clean, potable, and free from substances which could adversely affect the mortar.
E. Cold Weather Accelerating Admixture: Complying with ASTM C494 non-corrosive, containing less than 0.2 percent chlorides.

F. Masonry Mortar: Complying with ASTM C270.
   1. Mortar Types: Conform to the proportion specification of ASTM C270.
      a. Type S cement-lime mortar: 1 part cement, 1/2½ part lime, and 4-1/2 parts aggregate.
   2. Air-Content: When structural reinforcement is incorporated.
      a. Cement-lime mortar: 12 percent maximum.
      b. Masonry cement mortar: 18 percent maximum.

G. Packaged Mortar Material:
   1. Complying with ASTM C1142, Types RN, RS, and RM.
   2. Exceeds performance of the field-mixed mortar design.

H. Packaged Dry Material for Grout for Masonry:
   1. Complying with ASTM C476 with the addition of water only.
   2. Exceeds performance of the field-mixed grout design.

2.6 ACCESSORIES

A. Ties and Anchors
   1. Provide wire or sheet metal ties and anchors that are made from materials that comply with one of the following.
      a. Stainless-Steel Wire: AISI Type 304 or Type 316
   2. Wire Ties
      a. General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8 inch cover on outside face.
      b. Wire: Fabricate from 3/16 inch minimum diameter wire.
      c. Tie Section: Provide rectangular-shaped wire ties with closed ends not less than 4 inches wide, or provided triangular-shaped wire ties with outer ends bent to extend 2 inches parallel to face of veneer.

B. Joint Reinforcement:
   1. Factory fabricated from steel wire conforming to ASTM A1064, welded construction.
      a. Tack welding is not acceptable in reinforcement used for wall ties.
      1) Wire with a zinc coating conforming to ASTM A153, Class B-2.
      2) Wires with a minimum gauge per project requirements.
      3) Reinforcement: ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units.
      4) Joint reinforcement: place a minimum of 5/8 inch cover from either face. The distance between cross wires not to exceed 16 inches. Furnish Joint reinforcement for straight runs in flat sections not less than 10 ft. long.
      5) Joint reinforcement provide with factory formed corners and intersections.

C. Bar Positioners:

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1. Use to prevent displacement of reinforcing bars during the course of construction.
2. Provide factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish.
3. Allow no more than one wire to cross the cell.
4. Telescoping bar positioners: manufactured from AISI 1065 spring steel and coated in accordance with ASTM B633.

D. Preformed Control Joints:
   1. Rubber or PVC material. Provide with corner and tee accessories, fused joints Control Joint.

E. Expansion Joint Materials:
   1. Backer rod and sealant adequate to accommodate joint compression equal to 50 percent of the width of the joint with backer rod of compressible type suitable to prevent three-sided adhesion. See section 07 92 00 - Joint Sealants.
   2. Expansion Joint Material compression up to 50%; manufactured of closed cell neoprene conforming to ASTM D 1056, RE41:
      a. Adhesive on one side and 1/4 inch thick at Horizontal Joints,
      b. No adhesive and 3/8 inches thick at Vertical Joints;

F. Sheet Metal Flashing:
   1. See 07 62 00 - Sheet Metal Flashing and Trim.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Clean substrate free of laitance, dust, dirt, oil, organic matter, or other foreign materials and slightly roughen to provide a surface texture with a depth of at least 1/8 inch.

B. Sandblast if necessary, to remove laitance from pores and to expose the aggregate.

C. Ensure that exterior sheathing and weather-resistive air barriers are installed and transitioned per the project documents prior to erecting masonry units.

D. Do not compromise or otherwise harm the continuity of a continuous air and weather resistive barrier system specified in Section 07 25 00.

E. Provide continuous semi-rigid or rigid insulation complying with Section 07 21 00. Formwork fit tightly around penetrations and masonry anchors.

F. Prepare surfaces to receive work in accordance with manufacturer's instructions.
3.3 INSTALLATION - GENERAL

A. General: Install all materials in accordance with manufacturer’s instructions based on conditions present.

B. Coordinate masonry work with the work of other trades to accommodate built-in items and to avoid cutting and patching. Lay masonry units in the bond pattern per project requirements. Adjust each unit to its final position while mortar is still soft and plastic.

C. Remove clean and re-lay units that have been disturbed after the mortar has stiffened, with fresh mortar. Keep free from mortar and other debris air spaces, cavities, chases, expansion joints, and spaces to be grouted.

D. Select units used at the exposed masonry surface from those having the least amount of chipped edge or other imperfections detracting from the appearance of the finished work.

E. Shove units into place so that the vertical joints are tight.

F. Completely fill vertical face shells of concrete masonry units with mortar, except where indicated at control, expansion, and isolation joints.

G. Mortar is permitted to protrude up to 1/2 inch into the space or cells to be grouted.

H. Unfinished Work:
   1. Step back unfinished work for joining with new work. Tooothing may be resorted to only when specifically approved. Remove loose mortar and thoroughly clean the exposed joints before laying new work.

I. Cutting and Fitting: Use full units of the proper size wherever possible. Use power masonry saws and skilled masonry mechanics for cutting and fitting, including that required to accommodate the work of others.
   1. Concrete masonry units may be cut wet or dry.
   2. Dry wet cut units, before being placed in the work. Dry to the same surface-dry appearance as uncut units being laid.
   3. Cut edges clean, true, and sharp.
   4. Openings in the masonry: make carefully so that wall plates, cover plates, or escutcheons required by the installation will completely conceal the openings and will have bottoms parallel with the masonry bed joints.
   5. Provide reinforced masonry lintels above openings over 12 inches wide for pipes, ducts, cable trays, and other wall penetrations, unless steel sleeves are used.

J. Jointing: Tool joints when the mortar is thumbprint hard. Tool horizontal joints last. Brush joints to remove all loose and excess mortar. Mortar joints finishes:
   1. Tooled Joints (slightly concave)
      a. Use at joints in exposed exterior and interior masonry surfaces.
      b. Tool with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit.
      c. Perform so that the mortar is compressed and the joint surface is sealed.
      d. Use a jointer of sufficient length to obtain a straight and true mortar joint.

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2. Door and Window Frame Joints
   a. On the exposed interior side of exterior frames, rake to a depth of 3/8 inch, joints between frames and abutting masonry walls.
   b. On the exterior side of the exterior frames, rake to a depth of 3/8 inch, joints between frames and abutting masonry walls.

3. Joints Between Dissimilar Materials
   a. Seal joints between masonry and dissimilar materials with backer rod and sealant, unless otherwise directed by Engineer.

4. Joint Widths:
   a. Unit joint widths are the difference between the actual and nominal dimensions of the brick in either height or length.
   b. Unit expansion joint widths: as indicated.

K. Embedded Items:
   1. Fill spaces around built-in items with mortar. Point openings around flush-mount electrical outlet boxes in wet locations with mortar.
   2. Embed anchors, ties, wall plugs, accessories, flashing, pipe sleeves and other items required to be built-in as the masonry work progresses.
   3. Fully embed anchors, ties and joint reinforcement in mortar. Fill cells receiving anchor bolts and cells of the first course below bearing plates with grout.

L. Joint reinforcement:
   1. Install joint reinforcement at 16 inches on center or as indicated. Lap reinforcement not less than 6 inches.
   2. Install prefabricated sections at corners and wall intersections. Place the longitudinal wires of joint reinforcement to provide not less than 5/8 inch cover to either face of the unit.

M. Expansion joints:
   1. Provide joints subject to movement (seismic, thermal, shrinkage, etc.) as indicated.
   2. Provide continuous vertical joints where designed for movement, including through bond beams.
   3. In single wythe exterior masonry walls, provide open control joints with backer rod and sealant. Install sealant per Section 07 92 00 JOINT SEALANTS.
   4. Rake exposed interior control joints to a depth of 1/4 inch.
   5. Cut concealed control joints flush.

N. Shelf Angles:
   1. Provide hot-dipped galvanized shapes in conformance with ASTM A123.
   2. Provide sections not longer than 10 feet with 1/4 inch gap between sections.
   3. Miter and weld shelf angles at building corners with each angle not shorter than 4 feet, unless limited by wall configuration.
   4. Adjust shelf angles as required to keep masonry level and at the proper elevation per drawings.

O. Lintels:
   1. Masonry Lintels:
      a. Construct masonry lintels with lintel units filled solid with grout in all courses and reinforced with minimum two Number 4 bars in the bottom course unless otherwise indicated on the drawings.
b. Extend lintel reinforcement beyond each side of masonry opening 40 bar diameters or 24 inches, whichever is greater.

c. Support reinforcing bars in place prior to grouting and locate 1/2 inch above the bottom inside surface of the lintel unit.

### 3.4 FIELD QUALITY CONTROL

**A. Testing:**
1. Mortar Test: For each mix type required.
   c. Air content: ASTM C 91.
2. Grout Test: Compressive strength for each mix required per ASTM C1019.

**B. Tolerances:**
1. Lay masonry plumb, true to line, with courses level. Keep bond pattern plumb throughout. Square corners unless noted otherwise. Except for walls constructed of prefaced concrete masonry units, lay masonry within the following tolerances.
2. Variation from Plumb in the lines and surfaces of columns, walls, and arises:
   a. In adjacent masonry units: 1/8 inch
   b. In 10 feet: 1/4 inch
   c. In 20 feet: 3/8 inch
   d. In 40 feet or more: 1/2 inch
3. Variations from Plumb for external corners, expansion joints, and other conspicuous lines:
   a. In 20 feet: 1/4 inch
   b. In 40 feet or more: 1/2 inch
4. Variations from level for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines:
   a. In 20 feet: 1/4 inch
   b. In 40 feet or more: 1/2 inch
5. Variation from level for bed joints and top surfaces of bearing walls:
   a. In 10 feet: 1/4 inch
   b. In 40 feet or more: 1/2 inch
6. Variations from horizontal lines:
   a. In 10 feet: 1/4 inch
   b. In 20 feet: 3/8 inch
   c. In 40 feet or more: 1/2 inch
7. Variations in cross sectional dimensions of columns and in thickness of walls:
   a. Minus: 1/4 inch
   b. Plus: 1/2 inch

### 3.5 CLEANING

**A.** Remove excess mortar and grout from surface units.
3.6 **PROTECTION**

A. Do not apply uniform loads for at least 12 hours or concentrated loads for at least 72 hours after masonry is constructed. Provide temporary bracing as required.

**END OF SECTION**
SECTION 05 12 00
STRUCTURAL STEEL FRAMING

PART 1 – GENERAL

1.1 SECTION INCLUDES
A. Structural Steel
B. Grout

1.2 RELATED REQUIREMENTS
A. 09 90 00 – Painting and Coating.

1.3 DEFINITIONS
A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 SUBMITTALS
A. Submit materials in accordance with 01 33 00 – Submittal Procedures.
B. Product Data: For each type of product.
C. Shop Drawings: Show fabrication of structural-steel components and location.
D. Qualification Data: For installer, fabricator, testing agency.
E. Welding certificates.
F. Mill test reports for structural steel, including chemical and physical properties.
G. Source quality-control reports.
H. Field quality-control and special inspection reports.

1.5 QUALITY ASSURANCE
A. Welding Qualifications: See General Notes Sheet S1.1
   1. AISC 303.

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PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. WT-Shapes: ASTM A 992/A 992M
B. Angles: ASTM A 36/A 36M
C. Plate: ASTM A 36/A 36M
D. Cold-Formed Hollow Structural Sections: ASTM A 500/A 500M, structural tubing.
E. Welding Electrodes: Comply with AWS requirements.
F. Self-Weathering Steel: ASTM A588, HSS ASTM A847

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

2.3 PRIMER

A. Primer: Where occurs; fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat. See Contract Documents for location information.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION


2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
2. Surfaces to be field welded.
4. Surfaces enclosed in interior construction.
5. Steel canopies, Z-beam support and column scree supports and associated bolts, washers and faseteners.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."
3. SSPC-SP 7/NACE No. 4, "Brush-off Blast Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

2.8 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform shop tests and inspections.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Bolted Connections: Inspect shop-bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect shop-welded connections according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Liquid Penetrant Inspection: ASTM E 165.
2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
4. Radiographic Inspection: ASTM E 94.
D. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.


1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure.

C. Maintain erection tolerances of structural steel within AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

3.3 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3.4 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:

1. Verify structural-steel materials and inspect steel frame joint details.
2. Verify weld materials and inspect welds.
3. Verify connection materials and inspect high-strength bolted connections.

B. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.

1. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

   a. Liquid Penetrant Inspection: ASTM E 165.
   b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
   c. Ultrasonic Inspection: ASTM E 164.
   d. Radiographic Inspection: ASTM E 94.

END OF SECTION
SECTION 05 50 00

METAL FABRICATIONS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Design of metal fabrications.

B. Metal Fabrications.

1.2 RELATED REQUIREMENTS

A. 09 90 00 - Painting and Coating.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For fabricator and design engineer.

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

D. Product Data: On all cleaning, galvanizing, and finishing products, including VOC content.

E. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

F. Welders' Certificates: Submit certification for welders employed on the project, verifying AWS qualification within the previous 12 months.

G. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

A. Designer Qualifications: Professional structural engineer with 5 years of documented experience in design of this work and licensed in the location of the project.

B. Fabricators Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel (AC172). Company specializing in performing the work of this section with minimum 5 years’ experience on projects of similar size and complexity.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Items designed and shop fabricated out of steel sections, tubing, plates and pipe for exposed and concealed locations.

B. Items designed and shop fabricated out of stainless-steel sheet for exposed locations.

C. Items such as steel framing supports, tube steel, support angles, shelf angles, loose bearing plates, leveling plates, miscellaneous backing plates, steel weld plates,
angles, miscellaneous steel trim, pipe guards, metal supports, anchor bolts, steel pipe sleeves.

2.2 MATERIALS

A. Steel:

1. Steel Sections:
   a. ASTM A 36/A 36M.

2. Steel Tubing:
   a. ASTM A 500, Grade B cold-formed structural tubing.

3. Plates:
   a. ASTM A 283.

4. Pipe:
   a. ASTM A 53/A 53M, Grade B Schedule 40.

5. Break Metal Sheet:
   a. ASTM A792/792M

6. Fasteners:
   a. To suit application. Unless noted otherwise, match fasteners exposed to view with the material and color/finish of the material being fastened if metal, color and finish if not metal. Fasteners not exposed to view: galvanized steel unless otherwise note.

7. Bolts, Nuts, and Washers:
   a. ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.

8. Welding Materials:
a. AWS D1.1/D1.1M; type required for materials being welded.

B. Stainless Steel:

1. Sheet:
   a. SMACNA Sheet Metal Manual
   b. SSINA, Stainless Steel Primer and Designer Handbook, Special Finishes for Stainless Steel.
   c. ASTM A 666, Standard Specification for Annealed or Cold Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.

2.3 EXTERIOR FABRICATIONS

A. Steel Plate Entry Canopies

1. See structural for material and structural requirements. Fabricated plate steel canopies with water jet cut emblems as noted on the Drawings.
3. Verify all dimension in field prior to fabrication. Mitered corners, continuous weld all joints. Grind smooth all welds.

B. Steel Frame Barn Doors w/ Steel Plate Panels and Door Fastenings.

1. Shape: Bent Steel Plate, Steel Plate and H.S.S.
2. Steel Type: A36
4. Dimensions and fastening as noted on the Drawings.
5. Mitered corners, continuous weld all joints. Grind smooth all welds.

C. Steel Frame Barn Doors w/ Wood Panel Infill and door fastenings.

1. Shape: Bent Steel Plate and H.S.S.
2. Steel Type: A36
4. Dimensions and fastening as noted on the Drawings.
5. Mitered corners, continuous weld all joints. Grind smooth all welds. Wood channel siding and plywood infill per drawings.

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D. Steel Gutter with Endcaps (Pavilions)

1. Shape: Bent Steel Plate
2. Steel Type: A36
4. Dimensions and fastening as noted on the Drawings.
5. Mitered corners, continuous weld all joints. Grind smooth all welds prior to painting.

E. Fabricated Steel Pipe Downspout (Pavilions)

1. Shape: Schedule 40 steel pipe
2. Steel Type: A36
4. Dimensions and fastening as noted on the Drawings.
5. Mitered corners, continuous weld all joints. Grind smooth all welds. Provide welded flange for attachment to mounting brackets where required (pavilions).
6. Location: As noted on the Drawings.

F. Downspout Bracket (Pavilions)

1. Shape: Bent Steel Plate
2. Steel Type: A36
4. Dimensions and fastening as indicated on the drawing.
5. Verify all dimensions in field. Mitered corners, continuous weld all joints. Grind smooth all welds.
6. Location: Brackets to attach downspout piping to concrete walls at Pavilions.

G. Steel Window Frame

1. Shape: H.S.S.
2. Steel Type: A36
3. Finish: Shop primed and painted finish.
4. Dimensions and fastening as noted on the Drawings.
5. Mitered corners, continuous weld all joints. Grind smooth all welds prior to painting.
6. Location: Restroom 101 & Restroom 103

H. Bent Steel Plate Corner Guard

1. Shape: Steel Plate
2. Steel Type: A36

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3. Finish: Shop primed and painted finish to match adjacent siding color.
4. Dimensions and fastening as indicated on the drawing.
5. Verify all dimensions in field. Mitered corners, continuous weld all joints. Grind smooth all welds.
6. Location: Exterior corner guards to protect horizontal wood siding corners as noted on the Drawings.

I. Fabricated Steel Plate Exterior Corner Cladding and Frame

1. Shape: Bent Steel Plate
2. Steel Type: A36
4. Dimensions and fastening as noted on the Drawings.
5. Fasteners: Match vertical wood siding fasteners.
7. Location: Corner at overhead coiling doors Lifeguard 111.

J. Steel Plate Door Surround

1. Shape: Bent Steel Plate
2. Steel Type: A36
4. Dimensions and fastening as indicated on the Drawings.
5. Verify all dimensions in field prior to fabrication. Mitered corners, continuous weld all joints. Grind smooth all welds.
6. Location: Trim at exterior hollow metal doors.

K. Steel Plate Frame

1. Shape: Bent Steel Plate
2. Steel Type: A36
4. Dimensions and fastening as indicated on the Drawings.
5. Verify all dimensions in field prior to fabrication. Mitered corners, continuous weld all joints. Grind smooth all welds.

L. Stiffener

1. Shape: Steel Sheet
2. Steel Type: A36
3. Finish: Pre-finished fluoropolymer coating.
4. Thickness, dimensions and fastening as noted on the Drawings.

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5. Location: Bent plate stiffener to support vertical wood siding over canopies as noted on the Drawings.

M. Vertical Z-Girt

1. Shape: Steel Plate
2. Steel Type: A36
3. Thickness: 16 gage.
4. Dimensions: 2 inch front flange, 2 inch back flange, 3 ½ inch depth, length as required.
5. Finish: Shop primed and painted finish.
6. Fasteners: As noted in the drawings.
7. Verify all dimensions in field prior to fabrication.
8. Location: Vertical girts for attachment of vertical wood siding over cross laminated timber vertical walls.

N. Fabricated Steel Pipe Handrail (north exterior stairs)

1. Shape: Schedule 40 steel pipe
2. Steel Type: A36
4. Dimensions and fastening as noted on the Drawings.
5. Mitered corners, continuous weld all joints. Grind smooth all welds.
6. Location: As noted on the Drawings.

O. Stainless Steel Shower Cover

1. Shape: Stainless Steel Sheet
2. Stainless Type: 304
3. Thickness: 14ga.
4. Mechanical Finish: Non-Directional, Angel Hair.
5. Dimensions and fastening as noted on the Drawings.
6. Location: Vertical wall cover plate for exterior showers, see Drawings for location.

2.4 INTERIOR FABRICATIONS

A. Fabricated Steel Plate Counter Support

1. Shape: Bent Steel Plate and Angle
2. Steel Type: A36
3. Finish: Shop primed and painted finish.
4. Dimensions and fastening as indicated on the drawing.

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5. Verify all dimensions in field. Mitered corners, continuous weld all joints. Grind smooth all welds prior to painting.

B. Stainless Steel Counter

1. Shape: Stainless Steel Sheet
2. Stainless Type: 304
3. Thickness: 14ga.
4. Mechanical Finish: Non-Directional, Angel Hair.
5. Dimensions and fastening as noted on the Drawings.

C. Brackets to support stainless steel counter

1. Shape: Bent Steel Plate and Angle
2. Steel Type: A36
3. Finish: Shop primed and painted finish.
4. Dimensions and fastening as indicated on the drawing.
5. Verify all dimensions in field.
6. Location: Brackets to support bench Lifeguard 111.

D. Bench supports at privacy screen enclosures

1. Shape: H.S.S.
2. Steel Type: A36
3. Finish: Shop primed and painted finish.
4. Dimensions and fastening as indicated on the drawings.
5. Verify all dimensions in field.

E. Fabricated Steel Plate Bench Support

1. Shape: Bent Steel Plate and Angle
2. Steel Type: A36
3. Finish: Shop primed and painted finish.
4. Dimensions and fastening as indicated on the drawing.
5. Verify all dimensions in field. Mitered corners, continuous weld all joints. Grind smooth all welds prior to painting.
6. Location: Brackets to support bench Locker Rm. 110.

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2.5 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.6 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

2.7 FINISHES

A. Steel:

1. Prime paint all steel items noted these specifications.

   a. Exceptions:
1) Do not prime surfaces indicated as ‘unpainted raw steel finish’.
2) Where field welding is required.
3) Stainless steel fabrications.

B. Stainless Steel:

1. As noted these specifications.

2.8 ACCESSORIES

A. All accessory materials required by the fabricator for a complete installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Perform field welding in accordance with AWS D1.1/D1.1M.

3.3 INSTALLATION TOLERANCES

A. Maximum Variation From Plumb: 1/8 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/8 inch.

3.4 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

3.5 PROTECTION

A. Protect installed work as required by the fabricator to maintain finishes, product performance, design criteria and warranty.

END OF SECTION
SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Wood I-Joists.
B. Engineered Wood beams.
C. Roof-mounted curbs.
D. Roofing nailers.
E. Preservative treated wood materials.
F. Communications and electrical room mounting boards.
G. Miscellaneous wood nailers, furring, and grounds.

1.2 RELATED REQUIREMENTS

A. 05 50 00 - Metal Fabrications: Miscellaneous steel connectors and support angles for rough carpentry.
B. 07 62 00 - Sheet Metal Flashing and Trim: for sill flashing.
C. Structural Notes: for additional requirements

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
C. Shop Drawings: Indicate required flashings, sealing at openings.
D. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

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1.4 DELIVERY, STORAGE, AND HANDLING

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

B. Preservative Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Provide miscellaneous rough carpentry items including wood I-Joists, PSL’s, LSL’s, preservative treated wood materials, roof-mounted curbs, miscellaneous wood nailers, furring, and grounds.

B. Engineered Wood Products: Acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable design stresses, 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.

2.2 MATERIALS

A. Wood I-Joists: Prefabricated units, I-shaped in cross section, made with solid or structural composite lumber flanges and wood-based structural panel webs, let into and bonded to flanges. Comply with material requirements of and with structural capacities established and monitored according to ASTM D 5055.

1. Web Material: Either OSB or plywood, complying with DOC PS 1 or DOC PS 2, Exposure 1.
2. Structural Properties: Depths and design values not less than those indicated.

B. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-Joists at bearing ends, complying with research or evaluation report for I-Joists.

1. Manufacturer: Provide products by same manufacturer as I-Joists.
2. Material: All-veneer product, glued-laminated wood or product made from any combination solid lumber, wood strands, and veneers.
2.3 TIMBER CONNECTORS

A. Materials: Unless otherwise indicated, fabricate from the following materials:

B. Structural-steel shapes, plates, and flat bars complying with ASTM A 36/A 36M.

C. Round, steel bars complying with ASTM A 575, Grade M 1020.
   1. Hot-rolled steel sheet complying with ASTM A 1011/A 1011M, Structural Steel, Type SS, Grade 33.

D. Finish steel assemblies and fasteners with rust-inhibitive primer, 2-mil dry film thickness.

E. Hot-dip galvanize steel assemblies and fasteners after fabrication to comply with ASTM A 123/A 123M or ASTM A 153/A 153M.

2.4 MISCELLANEOUS MATERIALS

A. End Sealer: Manufacturer's standard, transparent, colorless wood sealer that is effective in retarding the transmission of moisture at cross-grain cuts and is compatible with indicated finish.

B. Penetrating Sealer: Manufacturer's standard, transparent, penetrating wood sealer that is compatible with indicated finish.

2.5 FABRICATION

A. Shop fabricate for connections to greatest extent possible, including cutting to length and drilling bolt holes.

B. Camber: Fabricate horizontal and inclined members of less than 1:1 slope with either circular or parabolic camber equal to 1/500 of span.

C. End-Cut Sealing: Immediately after end cutting each member to final length, apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.

D. Seal Coat: After fabricating, sanding, and end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each unit.

E. Lumber, General:
   1. Comply with DOC PS 20 and with applicable grading rules of inspection agencies certified by the American Lumber Standards Committee's (ALSC) Board of Review. Provide dressed lumber, S4S, with each piece factory marked with grade stamp of inspection agency.

F. Wood-Preservative-Treated Materials:
1. Comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC’s Board of Review. Dimension Lumber: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated. Refer to Structural “General Notes” located in the Drawings.

2.6 ENGINEERED WOOD PRODUCTS

A. Source Limitations: Obtain each type of engineered wood product from single source from a single manufacturer.

2. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

3. Parallel-Strand Lumber: Structural composite lumber made from wood strand elements with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.

B. Miscellaneous Lumber:

1. Provide No. 3 or Standard grade lumber of any species for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, and similar members.

2.7 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Fasteners and Anchors:

1. Metal and Finish: Stainless steel for exterior, high humidity or preservative-treated wood locations, unfinished steel elsewhere.

C. Sill Flashing:

1. Sill Flashing: As specified in 07 62 00 - Sheet Metal Flashing and Trim.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

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3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.4 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AFPA Wood Frame Construction Manual.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.

H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

3.5 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

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B. Provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Provide the following specific non-structural framing and blocking:

   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.
   7. Wall paneling and trim.
   8. Joints of rigid wall coverings that occur between studs.

3.6 ROOF-RELATED CARPENTRY

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

B. Provide wood curb at all roof openings except where prefabricated curbs are specified and where specifically indicated otherwise. Form corners by alternating lapping side members.

3.7 INSTALLATION OF CONSTRUCTION PANELS

A. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.

   1. At long edges provide solid edge blocking where joints occur between roof framing members.
   2. Nail panels to framing; staples are not permitted.

B. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

   1. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
   2. Provide inlet diagonal bracing at corners.
C. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.

1. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
2. Install adjacent boards without gaps.
3. Size and Location: As indicated on drawings.
4. Paint all mounting boards. leave one copy of fire treatment stamp visible (unpainted) for building inspector.

3.8 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.9 CLEANING

A. Waste Disposal: Comply with the requirements of 01 74 19 - Construction Waste Management and Disposal.

1. Comply with applicable regulations.
2. Do not burn scrap on project site.
3. Do not burn scraps that have been pressure treated.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

3.10 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 06 19 04
CROSS LAMINATED TIMBER

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Delegated design of cross laminated timber panels
B. Structural cross laminated timber panels for walls.
C. Structural cross laminated timber panels for roofs.
D. Non-structural cross laminated timber panels for walls

1.2 RELATED REQUIREMENTS

A. 05 12 00 – Structural Steel Framing
B. 05 50 00 – Metal Fabrications
C. 06 10 00 – Rough Carpentry
D. 07 25 00 – Weather Barriers
E. 09 90 00 – Painting and Coating

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Qualification Data: For Manufacturer and design engineer.
C. Delegated-Design Submittal: For assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
D. Product Data: Provide cross laminated panel manufacturer's product literature including structural properties, design load capacities and installation instructions.
E. Shop Drawings: Fully dimensioned fabrication and installation details for cross laminated panels. Indicate dimensions, materials, connections and arrangement of joints. Include anchorage, size and type of fasteners, and accessories.
1. Include calculations that indicate compliance with the applicable building code and the cross laminated panel manufacturer's requirements.
2. Clearly indicate the load and capacity assumptions selected. Include copies of any calculations.

F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

G. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
   3. Recommended schedule of maintenance.

1.4 QUALITY ASSURANCE
   A. Designer Qualifications: Professional structural engineer with 5 years of documented experience in design of this work and licensed in the state of Washington.
   B. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years' experience.
      1. Member of The Engineered Wood Association (APA).

1.5 DELIVERY, STORAGE, AND HANDLING
   A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 DESCRIPTION
   A. Cross laminated panels used in wall and roof assemblies including all accessories for complete installation.

2.2 PERFORMANCE AND DESIGN CRITERIA
   A. Provide cross laminated panels capable of withstanding design loads including dead load, live load, wind load and seismic load.
   B. CLT products conforming with APA PRG 320-2011

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C. Grade: V1
D. Thickness: 3 ply for main structures and 5 ply for pavilions.
E. Moisture Content: 8+/- 3 percent.
F. Laminations: comply with requirements of ASTM D5456.

2.3 MANUFACTURERS

A. Specification is based on CROSSLAM CLT by Structurlam.
   1. Comparable products by one of the following are also acceptable. See Section 01 60 00 - Product Requirements for submittal requirements.
      a. SmartLam.
      b. DR Johnson
   2. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.

2.4 MATERIALS

A. CLT products conforming with APA PRG 320-2011 including the following labeling.
   1. CLT grade qualified in accordance with standard.
   2. CLT thickness or identification
   3. Mill name or identification number.
   4. Approval agency name or logo
   6. Manufacturer’s designation.
   7. Top stamped if unbalanced construction.

B. Species: One side Douglas-Fir, Visual Grade
C. Adhesive: Purbond polyurethane adhesive
D. Edge: 1/8 inch chamfer on long edges.
E. Finish: Field applied in accordance with 09 90 00 – Painting and Coating.

2.5 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
B. Fasteners and Anchors:


PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work. Examine foundations, sills, framing and other surfaces to receive cross laminated panels.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

B. Where wood framing bears on cementitious foundations, install full width sill flashing continuous over top of foundation, lap ends of flashing minimum of 4 inches and seal.

C. Coordinate with installation of rough carpentry members specified in other sections.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

1. Comply with manufacturer's written recommendation for number, size and placement of fasteners.

2. Join cross laminated panel edges according to manufacturer's written recommendation.

B. Restrictions:

1. Do not over cut panels when field-cutting openings.

2. Do not install electrical chases inside cross laminated panels.

3. Do not install plumbing inside cross laminated panels without consulting manufacturer and obtaining written recommendations.

4. Protect cross laminated panel core from solvents and solvent vapors.

C. Prevent damage to cross laminated panels.

D. Install cross laminated panels plumb, square and true to line. Vertical to horizontal panels to have tightest joints possible.

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E. Seal panel joints with manufacturer’s recommended sealant.

F. Repair or replace damaged panels.

3.4 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

B. Do not leave panels exposed to moisture. Remove wet panels or allow to dry completely before installation of sealants, tape, weather barrier and siding or other veneer.

C. Protect installed cross laminated panels from subsequent construction operations.

D. Cover top and edges of unfinished panel work. Protect from weather and prevent accumulation of water in laminations.

END OF SECTION
SECTION 06 20 00
FINISH CARPENTRY

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Vertical Wood Column Screen
B. Wood Trellis
C. Sliding Barn Doors
D. Interior Bench and Privacy Screens/Benches
E. Miscellaneous Wood Trim

1.2 RELATED REQUIREMENTS

A. 05 50 00 – Metal Fabrications
B. 06 10 00 - Rough Carpentry
C. 07 46 23 - Wood Siding
D. 09 90 00 - Painting and Coating

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For fabricator.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot.
   2. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
   3. Product data on lumber grade and plywood sheet goods.

D. Sample: Submit three samples of each type of wood exposed to view:
   1. 18 inch long lumber, timber and trim illustrating to include a finished end and mounting hardware.

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E. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
   2. Single Source Responsibility: Provide and install this work from single fabricator.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the Quality Certification Program for installation of the installed products to meet the Performance and Design Criteria.

B. Materials shall be delivered to the job site in new, dry, unopened wrapping, clearly showing name of manufacturer and product.

C. Store materials in a dry area, protected from weather, water and extreme humidity.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Wood timbers, dimensional lumber and plywood, wall base and miscellaneous trim. Carpentry items shop fabricated and finished in accordance with AWI/AWMAC/WI Architectural Wood Work standards.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. FINISH CARPENTRY ITEMS
   1. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Custom Grade.
      a. Premium Quality for all transparent finished material.
      b. Typical: Custom Quality.

2.3 EXTERIOR WOODWORK ITEMS

A. Vertical Wood Column Screen
1. Timbers: Western Red Cedar as defined by the WRCLA.
   a. Species: Western Red Cedar  
   b. Size: Nominal 3 inch by 6 inch  
   c. Grade: Clear  
   d. Edge: Continuous Eased Edge  
   e. Moisture Content: Air dried or Kiln Dried to WRCLA specifications  
   f. Surface to be Exposed: Surface Four Sides (S4S)  
   g. End Grain Sealer: Site applied non-toxic wax emulsion to exposed end grain.

2. Site Finishing: Continuous lengths as noted on the Drawings.

3. Fasteners: See structural drawings for fastener types. Site coordinate fastener location with steel support and canopy. Neatly drill and countersink specified timber. Blowouts and tearouts in timbers will be unacceptable.

B. Wood Trellis

1. Timbers: Western Red Cedar as defined by the WRCLA.
   a. Species: Western Red Cedar  
   b. Size: Nominal 3 inch by 8 inch  
   c. Grade: Clear  
   d. Edge: Continuous Eased Edge  
   e. Moisture Content: Air dried or Kiln Dried to WRCLA specifications  
   f. Surface to be Exposed: Surface Four Sides (S4S)  
   g. End Grain Sealer: Site applied non-toxic wax emulsion to exposed end grain.

2. Site Finishing: Continuous lengths as noted on the Drawings.

3. Fasteners: See structural drawings for fastener types. Site coordinate fastener location with overhead steel support. Neatly drill and countersink specified timber. Blowouts and tearouts in timbers will be unacceptable.

C. Sliding Barn Doors


D. Shop Finishing:

1. Coordinate with steel fabrications, exterior siding dimensions and notes on the Drawings.

2. Sand work smooth and set exposed nails and screws.

3. Finish Work in accordance with Section 09 90 00 – Painting and Coating.
   a. Opaque:
      1) Exterior paint.  
      2) Color: See Drawings and Schedule, 09 90 00 – Painting and Coating  
      3) Sheen: As noted 09 90 00 – Painting and Coating.

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2.4 INTERIOR WOODWORK ITEMS

A. Interior Benches at Locker RM. 110:
   1. Benches as noted on the Drawings.
      a. Species: Douglas Fir
      b. Size: Nominal 2 inch by 3 inch
      c. Grade: Clear Vertical Grain
      d. Edge: Ease edges of lumber to 1/8-inch radius
      e. Moisture Content: Kiln Dried
      f. Surface to be Exposed: Surface Four Sides (S4S)
      g. Finish: Per Section 09 90 00 – Painting and Coating
   2. Site Finishing: Continuous lengths as noted on the Drawings.
   3. Fasteners: See architectural drawings for fastener types. Site coordinate fastener location with steel support. Blowouts and tearouts in wood members will be unacceptable.

B. Interior Privacy Screens/Benches at Women’s R.R. 105, Men’s R.R. 107:
   1. Privacy Screens as noted on the Drawings.
      a. Species: Douglas Fir
      b. Size: Actual 3 inch by 3 inch and Nominal 2 inch by 2 inch
      c. Grade: Clear Mixed Grain
      d. Edge: Ease edges of lumber to 1/16-inch radius
      e. Moisture Content: Kiln Dried
      f. Surface to be Exposed: Surface Four Sides (S4S)
      g. Finish: Per Section 09 90 00 – Painting and Coating
   2. Shop Fabrication:
   3. Site Finishing: Continuous lengths as noted on the Drawings.
   4. Fasteners: See architectural drawings for fastener types. Site coordinate fastener location with steel support. Blowouts and tearouts in wood members will be unacceptable.

C. Miscellaneous Wood Trim
   1. Base Trim as noted on the Drawings
      a. Species: Hem – Fir or Poplar
      b. Size: Nominal 1 inch by 6 inch
      c. Grade: Number 2 or better
      d. Edge: Ease edges of lumber to 1/16-inch radius
      e. Moisture Content: Kiln Dried
      f. Surface to be Exposed: Surface Four Sides (S4S)
      g. Finish: Factory primed and finished Per Section 09 90 00 – Painting and Coatings.
   2. Site Finishing: Continuous lengths insofar possible with mitered spice and joint, minimum lengths of 8 feet as noted on the Drawings.

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3. Fasteners: Provide all non-corrosive, nails, screws and other fastenings or reinforcing items required for joining materials securely together.

2.5 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the requirements of the quality standard specified before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with quality standard specified.

3.3 INSTALLATION

A. General: Fabricate, assemble and finish all finish carpentry at the shop insofar as possible; construct units in sizes to permit convenient and efficient handling and installation; provide all items necessary for complete installation at the locations required. Machine all parts for precision fit and assemble with fastenings (pre-drill where necessary) and adhesives for permanently secure construction. Construct finish carpentry to true dimensions, square, level and plumb; verify all critical installation dimensions at the job site prior to fabricating items requiring close tolerance installation. Make accurate and tight joints; form to conceal shrinkage as far as possible; secure by gluing and fastening. Fasteners as noted in the Drawings.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut to fit adjoining work. Refinish and seal cuts as recommended by quality standard.
2. Where face fastening is unavoidable, countersink fasteners, fill surface flush, and sand unless otherwise indicated.
3. Install to tolerance of 1/8 inch in 96 inches for level and plumb. Install adjoining interior finish carpentry with 1/32 inch maximum offset for flush installation and 1/16-inch maximum offset for reveal installation.

C. Install with trim with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 48 inches long, except where necessary. Stagger joints in adjacent and related standing and running trim. Miter at returns, miter at outside corners, and cope at inside corners to produce
tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints.

3.4 PROTECTION

A. Protect installed work as required by the quality standard to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 06 41 00
ARCHITECTURAL WOOD CASEWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Cabinet units.
B. Countertops.
C. Hardware.

1.2 RELATED REQUIREMENTS

A. 06 10 00 - Rough Carpentry
B. 06 20 00 - Finish Carpentry
C. 09 90 00 – Painting and Coating
D. 09 65 13 – Resilient Base and Accessories

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with 01 30 00 - Administrative Requirements.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.4 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Qualification Data: For fabricator, and installer.
C. Product Data: Provide data for hardware, accessories, and finishes.
D. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Minimum Scale of Detail Drawings: 1 inch to 1 foot.

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2. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.

E. Sample: Submit actual samples of Architectural cabinet construction, minimum 12 inches square, illustrating proposed cabinet, countertop, and shelf unit substrate and finish.

F. Hardware Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

G. Manufacturer's Installation Instructions: For finishes and hardware. Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

H. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.5 QUALITY ASSURANCE

A. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. As required by the quality standard and fabricator for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Custom designed and fabricated casework made of laminates and painted substrates, associated accessories and hardware.

2.2 MATERIALS

A. Cabinet units.

09/30/19
1. Construction:
   a. Casework Construction Type: Type A - Frameless.
   b. Interface Style for Cabinet and Door: Style 1 - Overlay; Full, unless detailed otherwise.
   c. Layout for Cabinet and Door Fronts:
      1) All grades all styles of cabinetwork: Doors, drawer fronts and false fronts wood grain and laminate pattern to run and match vertically within each cabinet unit.
      2) Custom Grade: Doors, drawer fronts and false fronts wood grain and laminate pattern to run and match vertically within each cabinet unit.

2. Wood-Based Materials:
   a. Hardwood Plywood: HPVA HP-1 Grade A; veneer core, type of glue recommended for application; of grain quality suitable for transparent finish.
   b. Lumber: Maximum moisture content of 6 percent.

3. Laminate Materials:
   a. Specification is based on products listed below.
      1) Comparable products by one of the following are also acceptable. See Section 01 60 00 - Product Requirements for submittal requirements.
         b) Panolam Industries International, Inc.
      2) Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.
   b. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.
      1) Horizontal Surfaces: HGS, 0.048 inch nominal thickness.
      2) Vertical Surfaces: VGS, 0.028 inch nominal thickness.
      3) Flame Retardant Surfaces: HGF, 0.048 inch nominal thickness.
      4) Cabinet Liner: CLS, 0.020 inch nominal thickness.
      5) Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.
   c. Colors:
      1) Colors: (Basis of Design)
         a) Counter Top/Backsplash: Nevamar, Maritime Gray – S6027T
         b) Door/Drawer/Shelves: Nevamar, Studio Gray – S6037T
B. Hardware:

1. Drawer Slides:
   b. Performance Criteria:
      1) Rated extra heavy duty grade for drawer size indicated.
      2) Drawer slides rated for 250 lbs minimum.
      3) Full extension.
      4) Self-close, stay closed feature.

2. Door and Drawer pulls:
   b. Performance Criteria:
      1) ADA Compliant
      2) Finish: Brushed nickel.
      3) Lengths: Available from 1-3/4 inches to 9 inches.
      4) Required lengths as indicated on drawings.

3. Hinges:
   b. Acceptable manufacturers: Hafele, Salice and Blum.
   c. Features:
      1) Type: 110 degree opening Euro style concealed with soft closing feature.
      2) Finish: Satin Chrome
      3) Sizes: Refer to cabinet dimensions indicated on the Drawings.

4. Cabinet Locks:
   b. Features:
      1) Style: as selected by Architect from manufacturer's standard offerings.
      2) Finish: Stainless Steel.
      3) Keyed: as required by Owner.

2.3 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

09/30/19
3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with fabricator's instructions.

3.3 INSTALLATION

A. Install casework units as indicated, complete with all hardware and accessory items, pre-drilling where necessary; make plumb and level and securely attach to adjoining construction. Adjust hardware and fittings for operation to the satisfaction of the architect; clean all exterior and interior surfaces and repair all damage to finishes. Leave the work free from defects and ready for the Owner's use, as approved at the time of final acceptance.

3.4 CLEANING

A. Dispose of all waste material in accordance with Section 01 74 00 - Cleaning.

3.5 PROTECTION

A. Provide final protection and maintain conditions, in a manner acceptable to Fabricator and Installer, which ensures architectural millwork being without damage or deterioration at time of Substantial Completion.

END OF SECTION
SECTION 07 19 00

WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Clear water-repellent sealers at the following locations:
   1. Exterior concrete as noted on the Drawings.
   2. Grout sealer at glazed face CMU.

B. Concrete sealer at interior concrete floors is specified in 03 30 00 – Cast-in-Place Concrete.

1.2 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Product Data: Product description, limitations, cautionary procedures, chemical properties, percent solids, volatile organic compound (VOC) emissions, and flash point.

C. Manufacturer’s Installation Instructions: Indicate special procedures and conditions requiring special attention.

D. Sample Coatings: Water-repellent sealer on same concrete and masonry sample as accepted for project illustrating no visible difference between coating systems in hue, shade, or sheen.

E. Sample Warranty: Meet or exceed provisions specified by this Section.

1.3 CLOSEOUT SUBMITTALS

A. Manufacturer’s Certification: Certify that applications are in accordance with these specifications and as required to conform to manufacturer’s Warranty provisions.
B. Purchase Invoice: Show that amount of water repellent applied to wall surfaces conform to required coverage rates as determined from approved mock-up and manufacturer's field tests and instructions.

1.4 QUALITY ASSURANCE

A. Supply products from single manufacturer or under responsibility and Warranty of single manufacturer.

B. Determine final product acceptance from mock-ups, inspections, and testing as needed to determine VOC emissions, performance, and least change in color, shade, and sheen upon substrate.

C. Arrange with manufacturer's authorized representative to perform testing, verifications, and inspections as necessary to determine final product use and to obtain specified Warranty.

1.5 QUALIFICATIONS

A. Manufacturer:
   1. Company specializing in work of this Section with minimum 5 years documented experience.
   2. Maintain locally available trained technical representative to perform tests, make evaluations, certify results, and as necessary to obtain specified Warranty.

B. Applicator:
   1. Company specializing in work of this Section.
   2. Able to show minimum 3 years documented experience.
   3. Trained and certified by manufacturer as qualified to perform work of this Section prior to Bid or accepted by Architect.

1.6 MOCK-UP

A. Apply water-repellent to concrete and masonry mock-up wall surfaces specified under related sections.

B. Acceptance by Architect is based on:
1. Changes in hue, shade, and sheen between water repellent coatings, graffiti coatings, and uncoated substrate material.

2. Water repellency.

C. Protect accepted mock-up as standard of quality for work of this Section.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Conform to manufacturer's instructions.

B. Deliver materials in original labeled and sealed containers.

C. Protect from freezing and from harmful temperature extremes in accordance with manufacturer's instructions.

1.8 PROJECT SITE CONDITIONS

A. Environmental Requirements: Conform to environmental precautions and conditions as recommended by manufacturer.

B. Surface and Air Temperatures: Minimum 40-degree F and rising.

C. Weather: Do not work on unprotected surfaces during rainy weather, where moisture is present, or inclement weather is forecast or expected before finishes can dry or cure.

1.9 WARRANTY

A. Water-Repellent: Manufacturer minimum 10-year labor and material water repellent Warranty. No exclusions accepted for wind driven rain.

PART 2 - PRODUCTS

2.1 PENETRATING WATER REPELLENT FOR CONCRETE

A. Performance Requirements:

1. Silane, Penetrating Water Repellent: Clear, monomeric compound containing 20 percent or more solids of alkyltrialkoxysilanes; with alcohol, mineral spirits, water, or other proprietary solvent carrier; and with 250 g/L or less of VOCs.

   a. Non-yellowing, deep penetrating, silane water repellent system, consisting of
chemical technology forming hydrophobic structure in pores of concrete. Water repellent shall result in no visible change in concrete appearance.

b. Resist intrusion of water, automotive oil, chlorine ions and other salts, deicer chemicals, and acids.

c. Permit vapor transmissions through concrete surfaces.

d. Present no visible difference in appearance between wall surfaces treated with water-repellent.

e. Water repellent shall be penetrating silane type. Minimum depth of penetration: 0.20 inch (5 mm).

f. Silicone oils, polymer, acrylic, latex, and other film forming water repellent coating technologies are not accepted.

g. Minimum 10-year manufacturer’s warranty on materials and labor.

B. Acceptance of actual water repellent shall be based on compliance with Performance Requirements and Architect’s acceptance of Mock-up.

2.2 WATER REPELLENT FOR GROUT AT GLAZED CONCRETE MASONRY UNITS (GCMU)

A. Penetrating sealer shall be as recommended by masonry manufacturer.

B. Performance Requirements:

1. Penetrating Sealer:

   a. Non-yellowing, consisting of an invisible barrier that is resistant to moisture and stains while allowing vapor to escape. Water repellent shall result in no visible change in grout appearance.

2.3 MANUFACTURERS

A. Manufacturers and products listed are for type and quality.

1. Other manufacturers and products will be considered as determined to achieve acceptable results with least change in sheen, color, and shade from original surface.

2. Manufacturer acceptance is based upon conformance to provisions of this Section including determination of actual products from mock-ups and compliance with performance requirements.

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B. ProSoCo, Inc.
   1. Gene B., Tel: (206) 384-8056; Paul Tessier, Tel: (425) 210-8696; Email
gene.bollinger@prosoco.com (Gene Bollinger, Mfrs Rep).
   2. Web Site: http://www.prosoco.com

C. Evonik Corporation.
   1. Tel 1-800-370-7821, Tel (253) 209-0074, Email bob@salleeco.com (Salleeco, Inc.,
   Bob Sallee, CSI) / Email jan@salleeco.com (Jan Guthrie CSI).

D. L&M Construction Chemicals.
   1. Tel (800) 367-3331, Fax (425) 562-6149, David Schwietz, Cellular (360) 398-3140,
   Email DavidSchwietz@gmail.com.
   2. Web Site http://www.lmcc.com

E. Fabrikem, Inc.
   1. Direct Line Tel (425) 452-2322, Fax (425) 637-0794, Email mfletcher-
er@mutualmaterials.com (Mutual Materials, Mike Fletcher, Architectural Rep)

F. Advanced Chemical Technologies, SiL-ACT.
   1. Tel (206) 282-9759, Fax (206) 281-1251, Cell (206) 484-8236, norcoe@msn.com
   (Norcoe, Inc, Jim Sullivan)
   2. Web Site http://www.advchemtech.com

G. Hydrozo
   1. Tel (425) 392-1876, Cell (206) 369-7351, Fax (425) 392-2781, Email
   rob@bechtelcoatingsupply.com (Rob Bechtel, CSI, NACE, SPPC, Bechtel Industrial
   Coating Supply)
   2. Web Site www.degussabuildingsystems.com

H. 511 Porous Plus
   1. Tel (800) 782-3369
   2. Web Site www.miraclesealants.com

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3. Substitution Requests: Acceptance of other manufacturers is based upon compliance with Performance Requirements, results of mock-up testing including visual appearance and results and final verification on site prior to installation, as accepted by Architect.

2.4 MATERIALS

A. Product Acceptance: Based upon conformance to provisions of this Section including determination of actual products from mock-ups and testing results.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify conditions ready to receive work of this Section.
   1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect the substrate before application of water repellent and to instruct Applicator on the product and application method to be used.

B. Verify joint sealants installed and cured minimum 72 hours before proceeding with work.

C. Verify that surfaces clean, dry, and free of efflorescence, oil, dirt, and other conditions detrimental to application of water-repellent.

D. Verify that that moisture vapor drive resulting in efflorescence is complete. Do not attempt applications or to seal walls that are efflorescing.

3.2 PREPARATION

A. Notify Manufacturer's representative at least 48 hours before application. Do not begin application until manufacturer's representative has approved proposed application conditions and equipment.

B. Cover and protect vegetation, glass, painted surfaces, vehicles, and other surfaces not designated to receive water repellent sealer system. Take measures to protect surfaces from spillage, blow-over, and over-spray.
3.3 APPLICATION

A. Conform to manufacturer’s instructions and provisions of Contract Documents in mixing and application of water repellent.

B. Apply at rate of coverage as applicable to porosity of each substrate, as determined from mock-up results and testing.

C. Do not exceed coverage rates or build-up in application thickness that may result in lack of uniformity in hue, sheen, or light reflectance from surface.
   1. Limit run-down over dried coating surfaces below application.
   2. Do not overlap new application over adjacent application.

3.4 FIELD QUALITY CONTROL

A. Manufacturer’s Field Services: Following application, perform moisture tests to verify water repellent performance, as necessary to conform to Warranty requirements specified by this Section. Cost for field testing will be the responsibility of the Water Repellent Manufacturer.
   1. Field tests shall be performed by manufacturer’s certified technical representative.
   2. Acceptable minimum results are as stated in the warranty provisions. Coverage rate used to pass this test section must be used on entire project.
   3. Work that does not conform to requirements shall be corrected and/or replaced by Contractor as directed by the Owner’s Representative without additional cost to the Owner.

B. Furnish written certification that surface preparation method and final condition has Manufacturer’s approval and comply with the warranty.

3.5 ADJUSTING

A. Reapply additional coatings where testing, logs, or invoices indicate insufficient coverage.

B. Repair or replace damaged surfaces caused from over-spray, blow-over, and spillage.
3.6 CLEANING

A. Promptly clean spillage, blow-over, and over-spray from glass, vegetation, paint, and other surfaces following manufacturer recommended cleaning methods.

B. Leave premises clean of debris and residue resulting from work of this Section.

END OF SECTION
SECTION 07 21 00
THERMAL INSULATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Foam Board Insulation.
B. Fiber Batt Insulation.
C. Foam Detailing Insulation.
D. Nail Base Wall Insulation

1.2 RELATED REQUIREMENTS

A. 07 54 00 – hermoplastic Membrane Roofing
B. 09 21 16 – Gypsum Board Assemblies

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

C. Test Report: Submit report of full-size mock-up test for NFPA 285 fire performance, with project cladding assemblies highlighted, for foam insulation on exterior.

D. Shop Drawings: Indicate required flashings, control joints, and expansion joints, and sealing details at openings, projections, penetrations, and sleeves to maintain continuous thermal barrier.

E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

1. Include recommended fastening components and spacing to control sag.
2. Include manufacturer’s recommended product for thermal barrier over foam insulation exposed to interior in accordance with IBC 2012.2603.4.
a. "...tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275."

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years’ experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered in original packages, containers, or bundles showing brand name and identifying marks. Protect all material from moisture damage before and after installation. Replace or repair all damaged material at no additional cost to the Owner.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Foam board, fiber board, batt and low expansion detailing foam thermal insulation. Wall assembly R-value as noted on the Drawings.

2.2 MATERIALS

A. Foam Board Insulation:

   a. Basis of Design Product: EPS by INSULFOAM. Comparable and substituted products will be judged based on the following performance criteria, features, warranty, and qualifications.
   b. Performance Criteria:
      1) Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
      2) Complies with fire-resistance requirements as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285 in cladding systems matching project.
      3) Water Absorption: 4 percent by volume, maximum, when tested in accordance with ASTM D2842.
      4) Board Density: 0.7 lb/cu ft.
      5) Compressive Resistance: 25 psi.
      6) Thermal Conductivity (k factor) at 25 degrees F: 0.28.
      7) Thermal Resistance (R Value) at 40 degrees F/inch of thickness: 3.6.
CITY OF KIRKLAND
JUANITA BEACH PARK BATHHOUSE
THERMAL INSULATION

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C. Features:

1) Board Size: 48 x 96 inch.
2) Board Thickness: 1-1/2 inches.
3) Board Edges: Square.

B. Fiber Batt Insulation:

1. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   b. Comparable products by one of the following are also acceptable. See Section 01 60 00 - Product Requirements for submittal requirements.

   c. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.
   d. Performance Criteria:
      1) Combustibility: Non-combustible, when tested in accordance with ASTM E136.
      2) Flame Spread Index: 25 or less, when tested with facing, if any, in accordance with ASTM E84.
      3) Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
      4) Thermal Resistance (R Value) at 40 degrees F/inch of thickness: 3.7.

   e. Features:
      1) Formaldehyde Free.

   b. Comparable products by one of the following are also acceptable. See Section 01 60 00 - Product Requirements for submittal requirements.

   c. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 – Substitution Request Form.
   d. Performance Criteria:
1) Combustibility: Non-combustible, when tested in accordance with ASTM E136.
2) Flame Spread Index: 25 or less, when tested with facing, if any, in accordance with ASTM E84.
3) Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
4) Thermal Resistance (R Value) at 40 degrees F/inch of thickness: 3.1.

e. Features:

1) Formaldehyde Free.

C. Nail Base Wall Insulation: Thermally efficient non-structural composite insulation. Consisting of closed-cell polyisocyanurate (polyiso) roof insulation board bonded to CDX Plywood on the top face.

D. Nail Base Nailable Wall Insulation units shall conform to the following standards:

a. Units shall comply with ASTM C1289, Type V.
b. Dimensional Stability - ASTM D2126: less than 2 percent.
c. Compressive Strength - ASTM D1621: 20 pounds per square inch (140 kPa) or 25 pounds per square inch (172 kPa).
d. Water Absorption - ASTM C209: less than 1.5 percent.
e. Water Absorption - ASTM D2842: less than 3.5 percent.
f. Water Vapor Transmission - ASTM E96: less than 1.0 perm (57.5ng/(Pa•s•m2)).
g. Product Density - ASTM D1622: Nominal 2.0 pounds per cubic foot (32.04 kg/m3).
h. Flame Spread - ASTM E84 less than or equal to 75.
i. Smoke Development - ASTM E84 less than or equal to 450.
j. Tensile Strength - ASTM D1623: greater than 730 pounds per square foot (35 kPa).
k. Service Temperature: -100°F to +250°F.

E. Unit characteristics:

F. Panel Area:

1) 4 feet x 8 feet (1220 millimeters x 2440 millimeters)
b. Unit thickness: 2 ½ inch overall thickness made up of one layer of 1 7/8 inch polyisocyanurate board bonded to 3/4 inch thick CDX plywood facer.
c. Overall Unit Minimum Long-Term Thermal Resistance (LTTR): R-12.

G. Approved Products:

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2.3  ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Sheet Vapor Retarder: Specified in 07 25 00 – Weather Barriers.

C. Protection Membrane: White, Polypropylene fiberglass scrim.
   2. Performance:
      a. Flame Spread Index: 25 or less, when tested with facing, if any, in accordance with ASTM E84.
      b. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
      c. Light Reflectance: 85% minimum when tested in accordance with ASTM C423.
      d. Tensile Strength: 40 lbs/inch width (MD) when tested in accordance with ASTM C1136.
      e. Dimensional Stability: 0.030% maximum when tested in accordance with ASTM D1204.

D. Insulation Fasteners: Impaling clip of unfinished steel with washer retainer and clips, to be adhered to surface to receive insulation, length to suit insulation thickness and substrate, capable of securely and rigidly fastening insulation in place.

E. Surface Bonding Cement:
   2. Acceptable alternates:

PART 3 - EXECUTION

3.1  EXAMINATION

A. Verify existing conditions meet the manufacturer’s requirements before starting work.

3.2  PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer’s instructions.
B. Prior to the work of this section, carefully inspect the work of other trades and verify that all such work has been completed to the point where this installation may properly commence.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 – Construction Waste Management and Disposal.

3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 07 25 00
WEATHER BARRIERS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Mechanically Fastened Water Resistive Barrier Sheet.
B. Flexible Flashings.

1.2 RELATED REQUIREMENTS
A. 07 21 00 - Thermal Insulation: Vapor retarder and air barrier components installed in conjunction with insulation.
B. 07 54 00 - Thermoplastic Membrane Roofing: Vapor retarder and air barrier components installed in conjunction with roofing membrane.
C. 07 62 00 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

1.3 DEFINITIONS
A. Water-Resistive Barrier: Water-shedding barrier made of material that is moisture-resistant, to the degree specified, intended to be installed to shed water without sealed seams.

1.4 SUBMITTALS
A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Qualification Data: For Installer.
C. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
D. Shop Drawings: Indicate required flashings, sealing at openings and special joint conditions.
E. Manufacturer's Field Service Reports: Provide site reports from authorized field service representative, indicating observation of air barrier system installation.

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G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, perimeter conditions requiring special attention, and storage and handling criteria.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience with local product representation available to review product installation.

B. Installer Qualifications: Company specializing in performing the work of this section, using specified materials with minimum 5 years of experience on projects of similar size and complexity.

1.6 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Components under opaque cladding; including water resistive barriers and flexible transition flashings.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Air Permeability

1. The system: air permeability not to exceed 0.04 cfm/ft2 under a pressure differential listed. When tested per ASTM E 2357

B. Air Infiltration: 0.004 cfm/sq ft maximum per ASTM E-283.

C. Fire Performance: Tested in accordance with, and complying with the acceptance criteria of, NFPA 285; testing must be performed specifically for this project.

D. Fire Performance: . . . combustible exterior wall coverings shall be tested in accordance with NFPA 268.

1. 2012 IBC.1406.1.1.
2.3 MATERIALS

A. Mechanically Fastened Weather Barrier Sheet.

   1. Specification is based on #30 Felt Building Paper by GMC Roofing and Building Paper, Inc.

      a. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.

B. Flexible Flashings.


      a. Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

         1) Flashing product recommended by weather barrier manufacturer.
         2) W.R. Grace & Company Perm-A-Barrier Detail Membrane.
         3) Henry; Blueskin SA.
         4) Tremco, Inc.; ExoAir 110/110LT.

   2. Primers, Cleaners, Insulation Adhesive, Joint Compound and Sealant Materials: As recommended by air barrier manufacturer, appropriate to application, and compatible with adjacent materials

2.4 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Counter-flashing and Transition Strips: Modified bituminous or butyl based, 40-mil thick, self-adhering sheet flashing, polyethylene or foil carrier sheet as location and function dictate.

C. Joint Reinforcing Strip: Manufacturer's joint reinforcing tape.

D. Substrate-Patching Membrane: Manufacturer's standard trowel-grade substrate filler.

E. Adhesive and Tape: Manufacturer's standard adhesive and pressure-sensitive adhesive tape.

F. Joint Sealant: Per 07 92 00 - Joint Sealants.

PART 3 - EXECUTION

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3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer’s requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer’s instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 CLEANING

A. Clean dust, dirt and debris from the surface of air and water resistant barriers prior to installation of furring and/or cladding materials.

3.5 PROTECTION

A. Protect air and water barrier system from damage during application and remainder of construction period, according to manufacturer's written instructions.

B. Repair damage before proceeding with subsequent construction.

C. Clean spills, stains, and soiling from construction that would be exposed in the completed work using cleaning agents and procedures recommended by manufacturer of affected construction.

D. Remove masking materials after installation.

3.6 SCHEDULE

A. Water-Resistive Barriers as indicated.

B. Flexible Flashings:

1. Self-Adhering Flexible Flashing: Transition flashing at sheathing, metal flashings, locations and other locations indicated.

END OF SECTION
SECTION 07 41 13
METAL ROOF PANELS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Prefinished Metal Roof Panels.

1.2 RELATED REQUIREMENTS

A. 05 50 00 – Metal Fabrications

B. 07 90 05 - Joint Sealers: for joint sealant installed with system.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.

   1. Summary of test results, indicating compliance with specified requirements.
   2. Specimen warranty.

C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.

   1. Show work to be field-fabricated or field-assembled.

D. Sample: For each roofing system specified, submit samples of minimum size 12 inches square, representing actual roofing metal, thickness, profile, color, and texture.

E. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

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F. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

G. Maintenance Data: For users operation and maintenance of system including:

1. Methods for maintaining system's materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project.

1. Not less than 5 years of documented experience
2. Accredited by IAS according to IAS AC472.

B. Installer Qualifications: Company trained and authorized by roofing system manufacturer and specializing in performing the work of this section with minimum 5 years experience.

C. Mock-Up: Install at project site a job mock-up using acceptable products and manufacturer approved installation methods. Obtain Owner's and Architect's acceptance of finish color, texture and pattern and workmanship standard.

1.5 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered in original packages, containers, or bundles showing manufacturers name and identifying marks. Protect all material from moisture damage before and after installation. Replace or repair all damaged material at no additional cost to the Owner.

B. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

A. Finish Warranty: Provide manufacturer’s special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant chalking, cracking, or peeling within specified warranty period of 20 year period from date of Substantial Completion.
PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Complete roofing assemblies, including factory formed panels with factory applied finish roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for conformance with performance criteria.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F.

B. Roof Covering External Fire-Resistance Classification: UL Class A.

C. Wind Uplift: Class 90 wind uplift resistance of UL 580.

D. Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.

E. Provide continuity of thermal barrier at building enclosure elements and continuity of air barrier and vapor retarder seal at building enclosure elements in conjunction with materials specified in Section 07 25 00.

F. Accommodate movement within system without damage to components or deterioration of seals, movement within system; movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.

G. Fabricate and finish panels and accessory items at factory, using manufacturer’s standard processes as required to achieve specified appearance and performance requirements.

H. Factory-install captive gaskets, sealants, or separator strips at panel joints to provide weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

2.3 METAL ROOF PANELS

A. Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792, Class AZ50 coating designation; structural quality. Smooth surface texture;
continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating.

1. Features:
   a. Sheet Thickness: 24 gauge.
   b. Alloy: Galvalume steel sheet conforming to ASTM A792
   c. Finish: Fluoropolymer Coating System: Manufacturer’s standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil.
   d. Profile: Standing Seam
   e. Seam Height: 1-3/4 inches
   f. Panel Coverage: 18 inches
   g. Color: Weathered Zinc (standard metallic Kynar color)

2.4 MANUFACTURERS

A. Specification is based on TBC-Ultra Panel profiles and standard finishes by The Bryer Company, Inc.

1. Comparable products by one of the following are also acceptable. See 01 60 00 - Product Requirements for submittal requirements.
   a. AEP Span.
   b. FABRAL.
   c. Morin.

2. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 - Product Requirements.

2.5 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels.

C. Underlayment: In accordance with 07 25 00 Weather Barriers

D. Sealants: As specified in 07 90 05 Joint Sealers.

   1. Exposed sealant must cure to rubber-like consistency.
   2. Concealed sealant must be non-hardening type.

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E. Rib and Ridge Closures: Provide prefabricated, close-fitting components of same material and finish as roof panels.

F. Miscellaneous Secondary Framing: Light gauge steel framing incidental to structural supports; fabricated from steel sheet.

1. Profile: Manufacturer's standard profile for conditions present.
2. Material: As required for material compatibility with panel sheet material.

G. Attachment:

1. Concealed System: Provide manufacturer’s standard stainless steel concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

B. Coordinate with installation of associated counterflashings and other components installed under other sections

3.4 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

09/30/19
3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 07 46 23
WOOD SIDING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Exterior Horizontal Cedar Channel Siding.
B. Exterior Vertical Cedar Siding.

1.2 RELATED REQUIREMENTS

A. 05 50 00 – Metal Fabrications: for Door / Door Frame and Corner Protection.
B. 06 10 00 – Rough Carpentry: for substrate requirements for Wood Siding
C. 06 20 00 – Finish Carpentry: for requirements for Finish Carpentry.
D. 07 25 00 – Weather Barriers: for weather resistive barrier installed under horizontal wood siding.
E. 09 90 00 – Painting and Coating

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
C. Shop Drawings: Indicate required flashings, sealing at openings, materials, component profiles, fastening methods, jointing details, and accessories.
1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot.
2. Provide the information required by AWI/AWMAC/WI Architectural Woodwork Standards.
D. Sample: Submit samples of each type of siding utilized:
E. Horizontal Wood Siding: Submit minimum two samples and four boards that are 18 x 18 inch in size illustrating surface texture, and final finish of each type of siding indicated.
F. Maintenance Data: For users operation and maintenance of system including:
1. Methods for maintaining system's materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
3. Recommendations on maintenance schedule

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store in ventilated areas with constant minimum temperature of 60 degrees F and maximum relative humidity of 55 percent.

1.6 WARRANTY

A. Manufacturer’s Limited Warranty against Decay and Termites: Correct defective work within a 10 year period after Substantial Completion.

B. Manufacturer Warranty: Provide ten year warranty for waterproofing failing to resist penetration of water.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Wood siding for exterior walls and custom sliding door panels. Trim, flashings, accessories and fastenings.

B. Accessories: screws, nails, flashing.

2.2 MATERIALS

A. WS-1: Vertical Wood Siding:
   1. Species: Western Red Cedar.
   2. Grade/Description: C and Better Clear.
   3. Surfacing: Surfaced (smooth), S4S
   4. Ease edges of lumber less than 1 inch in nominal thickness to 1/16-inch radius and edges of lumber 1 inch or more in nominal thickness to 1/16-inch radius.
   5. Board Sizes: Nominal 2 inch by 2 inch and nominal 2 inch by 3 inch. Milled to longest continuous lengths as possible to minimize joints and waste.

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6. Finish: Natural
7. Moisture Content: Kiln Dried.
8. Fasteners: As indicated in the drawings.
9. Coatings: Per section 09 90 00 Painting and Coating.

B. WS-2: Horizontal Channel Siding:
   1. Species: Western Red Cedar.
   2. Grade: Select Tight Knot
   3. Profile: 1 inch by 8 inch nominal channel rustic siding.
   4. Layout: Per architectural details.
   5. Moisture Content: Kiln Dried.
   7. Fasteners: Blind and face fasten with corrosion resistant stainless steel finish nails as indicated.
   8. Thickness: as indicated in drawings.
   9. Surface to be exposed: Sawn Face.
   10. Coatings: per Section 09 93 00 – Staining and Transparent Finishing.

2.3 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that substrates are ready to receive work.

B. Verify that water-resistive barrier has been installed over substrate completely and correctly.

C. Do not begin until unacceptable conditions have been corrected.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

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B. Acclimate siding in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

B. Fasten siding in place, level and plumb. Do not crush wood with fastener.

C. Install board siding using single course method with exposure and spacing indicated.

D. Install vertical wood siding as indicated in the project drawings.

E. Install corner strips.

F. Install metal flashings at internal and external corners.

G. Touch-up and seal prefinished end grain and surfaces that are disfigured. Unsightly touch-up will require removal and replacement of affected siding.

H. Seal cut ends of boards with two coats of sealant provided by manufacturer.

3.4 TOLERANCES

A. Maximum Variation From Plumb and Level: 1/4 inch per 10 feet.

B. Maximum Offset From Joint Alignment: 1/16 inch.

3.5 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

3.6 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 07 54 00
THERMOPLASTIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES
   A. Roof Deck Sheathing.
   B. Vapor retarder.
   C. Insulation.
   D. Cover Board.
   E. TPO roofing membrane.
   F. Roof Edge Securement.
   G. Parapet Copings.

1.2 RELATED REQUIREMENTS
   A. 06 10 00 - Rough Carpentry: Wood nailers, curbs and cant strips.
   B. 07 21 00 – Thermal Insulation
   C. 07 62 00 - Sheet Metal Flashing and Trim: Counterflashings and reglets.
   D. 22 10 06 - Plumbing Piping Specialties: Roof drains.

1.3 ADMINISTRATIVE REQUIREMENTS
   A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section 01 30 00.
      1. Review preparation and installation procedures and coordinating and scheduling required with related work.
      2. Review UL, FM and Owner requirements for quality assurance and testing

1.4 SUBMITTALS
   A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

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B. Qualification Data: For Manufacturer and Installer.

C. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

D. Shop Drawings: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

E. Installer's Field Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application, and supplementary instructions given.

F. Manufacturer's Installation Instructions: Manufacturer's Installation Instructions: Indicate membrane seaming precautions and perimeter conditions requiring special attention.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

H. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in manufacturing the products specified in this section with minimum 10 years of documented experience in PVC roof membrane manufacture.

B. Installer Qualifications: Company specializing in performing the work of this section with a minimum five years experience and approved by the manufacturer. Applicator shall have installed at least three (3) roofing applications of this type or similar (single-ply membrane) system of equal or greater size within the past three (3) years.

1.6 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

B. All materials shall be delivered in original packages, containers, or bundles showing brand name and identifying marks. Protect all material from moisture damage before and after installation. Replace or repair all damaged material at no additional cost to the Owner.

C. Roof-covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required in accordance with IBC 2015 Section 1505. Bulk shipments of materials shall be accompanied with the same information issued in the form of a certificate or on a bill of lading by the manufacturer.

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1. IBC 2015.1506.1.

1.7 WARRANTY

A. Installation Warranty: Contractor shall correct defective Work within a year period after Date of Substantial Completion.

B. Manufacturer Warranty: Provide 20 year manufacturer's Total Roofing System (no dollar limit) Warranty covering all materials incorporated into the roof and labor.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Fully adhered single ply thermoplastic membrane roofing system including insulations, vapor retarder and all manufacturer's required accessories for watertight, warrantable installation.

B. Roofing Assembly Requirements:
   1. Solar Reflectance Index: 78
   2. Roof-Ceiling fire Resistance Rating: Class A

C. Acceptable Insulation Types: Tapered Application - any of the types specified.

D. Surfacing: Colored roof coating.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Slope: Thermoplastic single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope).

B. Exposure Category: As indicated.
   1. IBC 2015.1504.8 Maximum mean roof height table.

C. Nominal Design Wind Speed: As indicated.
   1. IBC 2015.1504.8 Maximum mean roof height table.

D. Wind Resistance: Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.
   1. IBC 2015.1504.3.

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2. Design Wind Load Pressure: As indicated.

E. Insulation Thermal Value (R), minimum: As indicated on Drawings; provide insulation of thickness required.

F. Perform work in accordance with NRCA Roofing and Waterproofing Manual, and manufacturer's instructions.

G. Detail roofing system as required by membrane manufacturer to attain required warranty and comply with performance criteria indicated.

H. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980.
   1. Requirement for white roofing only.
   2. Field applied coating may not be used to achieve specified SRI.

I. Thermal Emissivity: 0.80, minimum, initial, and 0.79, minimum, 3-year, certified by Cool Roof Rating Council.
   1. Requirement for white roofing only.

2.3 MATERIALS

A. Cover Board: High density polyisocyanurate cover board:
   1. Basis of Design Product:
      a. ProtectoR HD Cover Board from JohnsManville.
   2. Performance Criteria:
      a. Complies with ASTM C 1289 Type II, Class 4, Grade 2
      b. R-value: 2.5 r-value per 1/2 inch.
   3. Features:
      a. ½ inch thick.

B. TPO roofing membrane:
   1. Basis of Design Product:
      a. 80 Mil TPO by JohnsManville.
   2. Performance Criteria:
      a. Thermoplastic single-ply roof coverings shall comply with ASTM D 4434, ASTM D 6754, ASTM D 6878 or CGSB CAN/CGSB 37-54.
1) IBC 2015 1507.13.2.

b. Physical Integrity: Passes 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 155 or ASTM G 154.

1) IBC 2015.1504.6.

c. Impact Resistance: Resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

1) IBC 2015.1504.7.

3. Features:

a. Thickness: 0.080 inch.
b. Sheet Width: Factory fabricated into largest sheets possible.
c. Reinforcing: Manufacturer's standard.
d. Membrane Attachment: Fully adhered.
e. Colors: Installed in pattern indicated.

1) White.

C. Parapet Copings: Formed sheet metal coping with galvanized steel anchor/support cleats for capping any parapet wall; watertight, maintenance free, without exposed fasteners; butt type joints with concealed splice plates; mechanically fastened as indicated;

1. Performance:

a. At least the minimum required when tested in accordance with ANSI/SPRI ES-1 Test Method RE-3, current edition.
b. Provide product listed in current Factory Mutual Research Corporation Approval Guide with at least FM 1-90 rating.

2. Features:

a. Material and Finish: In accordance with 07 62 00 - Sheet Metal Flashing and Trim; matching concealed joint splice plates; factory-installed protective plastic film.

2.4 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Wood Nailers: PS 20 dimension lumber, Structural Grade No. 2 or better Southern Pine, Douglas Fir; or PS 1, APA Exterior Grade plywood; pressure preservative treated.

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PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify existing conditions meet the manufacturer’s requirements before starting work.
B. Do not start work until Pre-Installation Notice has been submitted to manufacturer as notification that this project requires a manufacturer’s warranty.

3.2 PREPARATION
A. Prepare surfaces to receive work in accordance with manufacturer’s instructions.

3.3 INSTALLATION
A. General: Install all materials in accordance with manufacturer’s instructions based on conditions present.

3.4 FIELD QUALITY CONTROL
A. Inspection by Manufacturer: Provide final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer specifically to inspect installation for warranty purposes.
B. Perform all corrections necessary for issuance of warranty.

3.5 CLEANING
A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

3.6 PROTECTION
A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 07 56 00

COLD LIQUID APPLIED MEMBRANE ROOFING

Part 1 - GENERAL

1.1 SUMMARY

A. The roofing system shall consist of a cold liquid applied reinforced waterproofing membrane, flashings and finish layers as noted on the Drawings.

1.2 RELATED REQUIREMENTS

A. 05 50 00 – Metal Fabrications
B. 06 19 04 – Cross Laminate Timber: Adjacent wood roof deck
C. 07 25 00 – Weather Barriers: Adjacent roof underlayment
D. 07 41 13 – Metal Roof Panels: Adjacent metal roof panels
E. 07 62 00 – Sheet Metal Flashing and Trim

1.3 DEFINITIONS


1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with 01 31 10 – Project Coordination.

1.5 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Qualification Data: For Manufacturer and Installer.
C. Product Data Sheets: Submit manufacturer’s product data sheets, installation instructions and/or general requirements for each component.
D. Color Chart: Manufacturers color chart for selection of color finish layer.

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E. Safety Data Sheets: Submit manufacturer’s Safety Data Sheets (SDS) for each component.
F. Sample warranty from the manufacturer and contractor.
G. Provide roof plan and representative detail drawings.
H. Submit a letter from the roofing manufacturer indicating the contractor is an authorized applicator.
I. Warranty: Provide manufacturer’s and contractor’s warranties upon project completion in accordance with 01 78 70 – Warranties and Bonds.

1.6 QUALITY ASSURANCE

A. Manufacturers Qualifications

1. Manufacturer shall have 20 years of manufacturing experience.
2. Manufacturer shall have trained technical service representatives employed by the manufacturer, independent of sales.
3. Manufacturer shall provide site visit reports in a timely manner.

B. CONTRACTOR QUALIFICATIONS:

1. Contractor shall be authorized by the manufacturer to install specified materials prior to the bidding period through satisfactory project completion.
2. Applicators shall have completed projects of similar scope using same or similar materials specified.
3. Contractor shall provide full time, on-site superintendent or foreman experienced with the specified roofing from beginning through satisfactory project completion.
4. Applicators shall be skilled in the application methods for all materials.
5. Contractor shall maintain a daily record, on-site, documenting material installation and related project conditions.
6. Contractor shall maintain a copy of all submittal documents, on-site, available at all times for reference.

C. SUBSTRATE EVALUATION:

1. Contractor shall evaluate substrate moisture content and adhesion of waterproofing materials to substrate throughout the work and record with daily inspection reports or other form of reporting acceptable to the owner or his designated representative and waterproofing manufacturer.
   a. Moisture content: Evaluate substrate moisture content to determine acceptability for application of the specified liquid applied waterproofing materials. Moisture testing shall be performed by means suitable to the project application, or by testing substrate relative humidity (RH) in accordance with ASTM
F 2170 when needed, required, or if substrate moisture content is in question.

b. Adhesion: Evaluate soundness and surface preparation of concrete and/or masonry substrates. Prepare representative areas using specified methods complete with applied primer and waterproofing membrane. Test for minimum acceptable tensile bond strength values as required in accordance with ASTM D 4541. Evaluate all areas where concrete appears to differ in appearance or consistency, if multiple areas are involved in the scope of work, evaluate each area with a minimum of (3) tests for every 5,000 ft² or as required by project conditions.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver materials and store them in their unopened, original packaging, bearing the manufacturer's name, related standards, and any other specification or reference accepted as standard.

B. Protect and store materials in a dry, well-vented, and weatherproof location. Only materials to be used the same day shall be removed from this location. During cold weather, store materials in a heated location, removed only as needed for immediate use.

C. When materials are to be stored outdoors, store away from standing water, stacked on raised pallets or dunnage, at least 4 in (100 mm) or more above ground level. Carefully cover storage with “breathable” tarpaulins to protect materials from precipitation and to prevent exposure to condensation.

D. Carefully store roof membrane materials delivered in rolls on-end with selvage edges up. Store and protect roll storage to prevent damage.

E. Properly dispose of all product wrappers, pallets, cardboard tubes, scrap, waste, and debris. All damaged materials shall be removed from job site and replaced with new, suitable materials.

1.8 SITE CONDITIONS

A. SAFETY:
   1. The contractor shall be responsible for complying with all project-related safety and environmental requirements.
   2. The contractor shall review project conditions and determine when and where conditions are appropriate to utilize the specified liquid applied or semi-solid roofing materials. When conditions are determined by the contractor to be unsafe or undesirable to proceed, measures shall be taken to prevent or eliminate the unsafe or undesirable exposures and conditions.
or equivalent approved materials and methods shall be utilized to accommodate requirements and conditions.

1.9 ENVIRONMENTAL CONDITIONS:

A. Monitor substrate and material temperature, as well as all environmental conditions such as ambient temperature, moisture, sun, cloud cover, wind, humidity, and shade. Ensure conditions are satisfactory to begin work and ensure conditions remain satisfactory during the installation of specified materials. Materials and methods shall be adjusted as necessary to accommodate varying project conditions. Materials shall not be installed when conditions are unacceptable to achieve the specified results.

B. Precipitation and dew point: Monitor weather to ensure the project environment is dry before, and will remain dry, during the application of roofing materials. Ensure all roofing materials and substrates remain above the dew point temperature as required to prevent condensation and maintain dry conditions.

C. Contractor shall implement odor control measures where required during the application of waterproofing materials and adjust methods as necessary to accommodate varying project conditions.

1.10 WARRANTY

B. The contractor shall guarantee the workmanship and shall provide the owner with the contractor’s warranty covering workmanship for a period of 2 years from completion date.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. ACCEPTABLE MANUFACTURERS:

1. SOPREMA, located at: 310 Quadral Drive, Wadsworth, OH 44281; Tel: 800-356-3521; Tel: 330-334-0066; Website: www.soprema.us.
2. SIPLAST, located at: 1000 Rochelle Blvd., Irving, TX 75062-2205; Tel 800-922-8800; Website: www.siplast.com.

2.2 LIQUID APPLIED WATERPROOFING SYSTEM

A. FLASHING MEMBRANE:
1. POLYMETHYL METHACRYLATE FLASHING MEMBRANE (PMMA):
   a. Flashing Membrane: Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing flashing membranes.
      i. VOC content: 4.2 g/L
      ii. Color: Grey
   b. Special Detail Membrane: Micro-fiber enhanced, rapid curing, polymethyl methacrylate (PMMA) paste resin used for flashing difficult penetrations where a resin/fleece/resin application is not practical.
      i. VOC content: 2.6 g/L
      ii. Color: Grey

B. FIELD MEMBRANE:

1. POLYMETHYL METHACRYLATE MEMBRANE (PMMA):
   a. Rapid curing, polymethyl methacrylate (PMMA) liquid resin with an embedded polyester reinforcement fabric used for monolithic waterproofing field membranes.
      i. VOC content: 2.3 g/L (summer), 2.4 g/L (winter).
      ii. Color: Grey.
      iii. Elongation at peak load, avg. (ASTM D412): 55%.
      v. Tear strength (ASTM D 5147): 107 lbf.
      vi. Shore A hardness, avg. (ASTM D2240): 81
      vii. Water absorption (Method I, 24h@73°F)(ASTM D570): 0.41%.
      viii. Water absorption (Method I, 48h@122°F)(ASTM D570): 1.57%.
      ix. Low temperature flexibility (ASTM D5147): -13°F.
      x. Dimensional stability (ASTM D5147): -0.063%.

2. AESTHETIC SMOOTH SURFACING COLOR LAYER
   a. Rapid curing, polymethyl methacrylate (PMMA) liquid resin combined with custom color additive for custom color surfacing.
   b. VOC content: 1.4 g/L
      i. Color: Clear
      ii. Custom color additive.
         a) VOC content: <5 g/L
         b) Color: Selected by the architect from the manufacturer's full line. Intent to match concrete color.
2.3 ACCESSORIES

A. PRIMERS:
1. Rapid curing, polymethyl methacrylate (PMMA) liquid resin used to promote adhesion of PMMA/PMA membranes over wood, concrete and approved waterproofing board substrates.
   a. VOC content: 2.6 g/L
   b. Color: Clear

B. CATALYST:
1. Reactive agent used to cure PMMA/PMA liquid resins.

C. REINFORCING FABRIC:
1. Woven polyester reinforcement used in PMMA/PMA liquid applied membrane and flashing applications.
   a. Thickness: 30-40 mils (0.8-1 mm)
   b. Weights: 110 g/m²
   c. Width(s): 10.3 in (26 cm), 13.8 in (35 cm), 20.7 in (53 cm), 41.3 in (105 cm). Size as required.
   d. Length: 164 ft (50 m)

D. PASTE AND MORTARS:
1. Rapid curing, polymethyl methacrylate (PMMA) paste resin used to fill small cracks and voids on non-traffic bearing substrates prior to the application of PMMA/PMA membranes.
   a. VOC content: 4.4 g/L
   b. Color: Grey
2. POLYMETHYL METHACRYLATE MORTAR (PMMA):
   a. Rapid curing, polymethyl methacrylate (PMMA) liquid resin used for patching, repairs and leveling. Consists of powder filler and liquid resin.
      i. Rapid curing, polymethyl methacrylate (PMMA) liquid resin.
         a) VOC content: 0.3 g/L
         b) Color: Grey
      ii. Filler powder: Filler.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examination includes visual observations, qualitative analysis, and quantitative testing measures as necessary to ensure conditions are satisfactory to begin, and remain satisfactory throughout the project.
B. The contractor shall examine all waterproofing substrates including, but not limited to: decks, walls, and wood blocking.

C. The applicator shall not begin installation until conditions have been properly examined and determined to be clean, dry and, otherwise satisfactory to receive specified roofing and waterproofing materials.

3.2 PREPARATION

A. Before commencing work each day the contractor shall prepare all substrates to ensure conditions are satisfactory to proceed with the installation of specified materials.

B. Preparation of substrates includes, but is not limited to, the following:

1. General:
   a. All substrates must be clean, dry and free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, release agents, lacquers, or any other condition that would be detrimental to adhesion of primer and/or resin materials to the substrate. Most surfaces will require mechanical abrasion in the form of scarifying, shot-blasting or grinding to achieve a suitable substrate.
   b. Inspect all substrates and correct defects before application of waterproofing materials. Fill all surface voids 1/16 in (1.5 mm) or greater wide and/or deep with appropriate fill material.

2. Concrete Substrates:
   a. Concrete shall comply with requirements of ACI 301 and ACI 308.
   b. Concrete compressive strength: 3,500 psi for all primers or 2,500 psi minimum when use of a moisture mitigation primer is required.
   c. Relative humidity: Maximum 75 percent per ASTM F2170 unless otherwise approved.
   d. Surface: Scarify, shot-blast or grind to ICRI Concrete Surface Profile CSP 3 to CSP 5; CSP 3 being the preferred profile.
   e. Adhesion: Adhesion of specified primer and liquid applied membrane shall be minimum 220 psi for traffic bearing waterproofing applications or 116 psi for roofing or non-traffic bearing waterproofing applications per ASTM D4541.
   f. Areas of spalls, voids, bug holes and other deterioration on vertical or horizontal surfaces shall be repaired as required or recommended.
   g. Contractor shall protect adjacent finish concrete surfaces as required during surface preparation.

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3. Wood Substrates:
   a. All new plywood substrates shall be structural panels performance-rated pursuant to National Institute of Standards and Technology (NIST) voluntary product standard PS-1-95; identified with American Plywood Association (APA) grade designations. All fasteners non-corrosive.
   b. Hygroscopic building materials such as wood plank, timber or plywood will normally have higher moisture content (in the range of 8% to 12%) as they adsorb or desorb moisture to reach equilibrium moisture content with the surrounding air. Cold liquid applied primer and reinforced membrane should not be applied to damp or wet sheathing materials, but may be applied to materials with higher moisture contents as indicated above, provided the exposed surface is clean and dry. Ultimately, determinations of moisture content and the resulting bond strength should be performed periodically to determine acceptability. If poor adhesion or blistering occurs, substrate will require additional drying time before proceeding.
   c. After priming plywood / CLT panels, fill joint gaps, holes and cracks with proprietary PMMA paste or PMMA mortar. All joints must be covered with minimum 1 in (25 mm) wide bond breaker tape followed with minimum 6 in (150 mm) wide strips of cold liquid applied reinforced waterproofing membrane centered over joint. Cover knot holes or cracks with strips of cold liquid applied reinforced waterproofing membrane.

4. Single ply and Other Flashing Surfaces:
   a. Remove all contaminants and prepare substrate as needed to receive liquid applied waterproofing.
   b. Adhesion: Examine substrates by conducting adhesion testing. Prime with specified primer where required to achieve adequate adhesion.

C. Where conditions are found to be unsatisfactory, work shall not begin until conditions are adjusted appropriately. Commencing of work shall indicate contractor’s acceptance of conditions.

3.3 PRIMER APPLICATION (GENERAL)
   A. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
   B. Examine all substrates and conduct adhesion peel tests as necessary to ensure satisfactory adhesion is achieved.
3.4 PMMA PRIMER APPLICATION

A. Mix primer resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of primer that can be used within the application time.

B. Apply the appropriate specified primer to dry, compatible substrates as required to enhance adhesion of new specified waterproofing materials.

C. Apply primer using brush or roller at the rate published on the product data sheet. Do not allow primer to pond or collect in low areas.

D. Project conditions vary throughout the day. Monitor changing conditions, and the curing time of primers.

E. Allow primer to fully cure before membrane application.

3.5 INSTALLATION & STAGING

A. In a normal cold liquid applied membrane application the substrate is prepared and primed, flashings are installed, followed by the application of the waterproofing membrane and finish. When applying broadcast aggregate, the aggregate should not be left subject to the elements, and therefore must be top-coated with finish the same day of application whenever possible.

B. If work is interrupted for more than 12 hours use manufacturer’s proprietary cleaner to clean and reactivate applied primer, resin mortar, flashing membrane or field membrane transition areas. Cleaner should be allowed a minimum of 20 minutes evaporation time after application and covered within 60 minutes of application or as recommended by the manufacturer.

3.6 FLASHING MEMBRANE APPLICATION

A. General:

1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.

2. Provide a minimum vertical height of 8 inch (200 mm) for all flashing terminations wherever possible. Flashing height shall be at least as high as the potential water level that could be reached as a result of a deluging rain and/or poor slope.

3. Do not flash over existing through-wall flashings, weep holes and overflow scuppers.

4. All flashing shall be terminated as required by the manufacturer. Cap flashings or counter flashings may be constructed of metal, stone, tile or other materials properly installed in accordance with industry-accepted practice.
5. Install all flashing membranes before installing field membranes.
6. The primed substrate shall be dry and free of any dust, loose particles or contaminants.
7. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
8. Immediately apply the reinforcing fleece into the wet base coat of resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
9. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.
10. Non-standard Flashing Details:
   When required, consult manufacturer for recommendations on flashing non-standard conditions, penetrations or protrusions.

3.7 FIELD MEMBRANE APPLICATION

A. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
B. Install all flashing membranes before installing field membranes.
C. The primed substrate shall be dry and free of any dust, loose particles or contaminants.
D. Mix waterproofing resin and catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
E. Apply the base coat of catalyzed waterproofing resin onto the substrate using a brush or roller, working the material into the surface for complete coverage and full adhesion.
F. Immediately apply the reinforcing fleece into the wet base coat of waterproofing resin making sure the smooth side is up. Using a brush or roller, work the reinforcing fabric into the wet resin while applying the second coat of catalyzed waterproofing resin to completely encapsulate the fleece. Avoid any folds and wrinkles.
G. At membrane tie-ins, clean cured membrane with specified cleaner before application of adjacent membrane.

3.8 WATERPROOFING CONTINUITY TESTING & QC EVALUATION

A. Prior to applying surfacing or finish, contractor shall conduct a complete evaluation of the installed liquid applied waterproofing membrane and flashings.
which shall include visual inspection as well as an acceptable method for (low voltage, high voltage or water-flood) continuity testing when required.

B. Immediately following evaluation and continuity testing, repair all deficiencies identified in liquid applied waterproofing membrane and flashings.

C. Upon satisfactory completion of all required repairs, proceed with application of finish layers.

3.9 SURFACING & FINISH

A. GENERAL:
1. Refer to manufacturer’s detail drawings, product data sheets and published general requirements for application rates and specific installation instructions.
2. Layout and install all surfacing and finish using manufacturer’s recommended practice and procedure with appropriate masking for clean lines between sections. Where possible use color breaks reviewed and approved by the owner and/or owners representative. Color breaks should help improve appearance, hide minor variations in color or texture and allow for localized repairs of the surfacing and finish if needed.
3. Install surfacing and finish layers over fully cured membrane layer.
4. The substrate shall be dry and free of any dust, loose particles or contaminants.
5. Mix resins using a slow speed agitator prior to pouring into a larger container.
6. Mix surfacing or finish resins with catalyst approximately 2 minutes using a clean spiral agitator on slow speed or stir stick until evenly mixed. Do not aerate. Mix only the amount of product that can be used within the application time.
7. Apply the catalyzed surfacing or finish resin onto the substrate as recommended, working the material into the surface for complete coverage and full adhesion.
8. At tie-ins and previously applied membrane, clean cured surface with specified cleaner before application of subsequent resin materials.
9. Traffic Surfacing and Finish are semi-rigid materials formulated for durability and performance. As semi-rigid components, when applied over softer or more flexible materials, cracks and micro fissures may occur in the surfacing and finish layer. Although this does not affect the system performance, it will impact the cosmetic appearance of the surfacing and finish. To help reduce or avoid potential cosmetic cracks or fissures, surfacing and finish should not be applied over areas of potential movement including the following:
a. Hold surfacing & finish back ½ in from horizontal to vertical transitions at walls, penetrations and leading edge of any bond breaker.
b. Do not apply surfacing & finish over any metal components where stripped in with membrane to allow for movement.
c. Do not apply surfacing & finish over expansion joints or other joints where movement is possible.

B. SURFACING – AESTHETIC COLOR FINISH
1. Provide waterproofing manufacturer’s proprietary monochromatic color finish resin to create a smooth and readily cleanable surface. This surfacing option is warranted for a period of 1 year from the date of completion. This surfacing option is not recommended where slip-resistant surfaces are required.

2. Surfacing Layer:
   a. Apply an even topcoat of pigmented finish resin using a notched hard rubber squeegee at minimum recommended consumption. Use an appropriate roller to remove excess resin or puddling.

3.10 CLEAN UP
A. Uncured resin is considered a hazardous material. Unused resin must be catalyzed and cured prior to disposal.
B. Clean up and properly dispose of waste and debris resulting from these operations each day as required to prevent damages and disruptions to operations.

3.11 PROTECTION
A. Upon completion of new work (including all associated work), institute appropriate procedures for surveillance and protection of finished work during remainder of construction period. Protect all areas where waterproofing membrane has been installed.

END OF SECTION
SECTION 07 62 00
SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fabricated sheet metal items.

1.2 RELATED REQUIREMENTS

A. 07 42 19 - Metal Plate Wall Panels for weather barrier accessories.

B. 07 46 23 - Wood Siding for weather barrier accessories.

C. 07 54 00 - Thermoplastic Membrane Roofing: for aluminum parapet copings.

D. 07 90 05 - Joint Sealers: sealants installed with sheet metal flashing and trim.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section - Administrative Requirements.

1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.4 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For fabricator.

C. Shop Drawings: Indicate material profile, jointing locations, jointing details, fastening methods, flashings, terminations, and installation details.

D. Samples:
1. Finish Sample: Submit two samples illustrating each metal finish color.
2. Fabrication Sample: Submit sample of coping lap joint as it will occur every 10 feet.

E. Warranty: Submit manufacturer finish warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

A. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

B. Comply with the applicable recommendations contained in "Architectural Sheet Metal Manual," latest revision, of the Sheet Metal and Air Conditioning Contractors National Association, Inc., in addition to complying with pertinent codes and regulations and ASTM standards.

1.6 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered in original packages, containers, or bundles showing brand name and identifying marks. Protect all material from moisture damage before and after installation. Replace or repair all damaged material at no additional cost to the Owner.

B. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.7 WARRANTY

A. Manufacturer’s Finish Warranty: Correct defective work within a 20 year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

1. Panel Finish Criteria are listed AAMA 2605.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Sheet metal fabricated into items such as flashings, counterflashings, and other items indicated and scheduled.

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B. Metal Flashing: Unless otherwise noted all exposed exterior sheet metal flashing and trim is pre-finished fluoropolymer coated sheet steel.

2.2 PERFORMANCE AND DESIGN CRITERIA

2.3 MATERIALS

A. Steel Sheet: Zinc-coated (galvanized) steel sheet complying with ASTM A 653, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with ASTM A 792, Class AZ50 coating designation; structural quality. Smooth surface texture; continuous-coil-coated on exposed surfaces with specified finish coating and on panel back with specified panel back coating:

1. Fluoropolymer Coating: ASTM A526, 20 gauge thick sheet metal with 1.25 oz./sq.ft. galvanized with Kynar 500, Hylar 5000, finish Or Approved Equal.

B. Stainless Steel: for all other uses: ASTM A 666 Type 304, rollable temper, 0.018 inch thick; smooth No. 4 finish.

2.4 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

D. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

2.5 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Fasteners.
1. Fasteners for use with metal flashing or sheet metal items shall be manufactured or coated with the same metal/color as the flashing.

2. Pop-rivets, screws, bolts, nuts and washers shall be of the type and size recommended by the manufacturer or specified as a component of an approved system. They shall be coated or plated with a corrosive resistant material either prior to or after installation.

3. Sealants shall be single component, gun grade, Dow-Corning 781, SikaDur, Sikaflex, Or Approved Equal, color to match.

C. Flexible Flashings.

1. See 07 25 00 – Weather Barriers, for additional information.

D. Slip Sheet: Rosin sized building paper.

E. Protective Backing Paint: See Section 09 90 00 - Painting and Coating.

F. Sealant: As specified in 07 90 05 - Joint Sealers.


H. Flux: Raw muriatic acid. Wash off thoroughly immediately after soldering.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 ADJUSTING

A. Adjust and lubricate hardware for proper operation.

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3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.6 SCHEDULE

A. Unless otherwise noted all exposed exterior sheet metal flashing and trim is pre-finished fluoropolymer coated sheet steel.

B. Counter Flashing:

1. Material: Stainless Sheet Steel.
2. Thickness: 20 gauge/0.080 inches.

C. Coping, Cap, Parapet, Sill and Ledge flashings:

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge/0.080 inches.
5. Color to match roofing.

D. Sliding Door Head Flashing, Storage 104, Rentals 108, Storage 109

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge/0.080 inches.
3. Seaming: Butt joint with concealed splice plates of pieces no less than 8 feet.
5. Color to match roofing.

E. Sliding Door Head Flashing, Women’s R.R. 105, Men’s R.R. 107

2. Thickness: 16 gauge/0.080 inches.
3. Seaming: Continuous length.

F. Roof gutters and fabricated end pieces:

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge/0.080 inches.
5. Color to match roofing.

G. Conductor Head

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge.
3. Seaming: Concealed insofar as possible.
4. Dimensions and fastening as noted on the Drawings.
5. Continuous caulk all joints.
6. Location: As noted on the Drawings.
7. Color to match roofing.

H. Downspouts (Bathhouse)

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge/0.080 inches.
3. Shape: Round 3 inch diameter.
4. Seaming: Continuous snaplock seams.
5. Corners: Shop fabricated elbows as indicated on the Drawings.
6. Color to match roofing.

I. Downspout Straps (Bathhouse)

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge/0.080 inches.
4. Dimensions and fastening as indicated on the drawing.
5. Verify all dimensions in field.
6. Location: Brackets to attach downspout piping to vertical wood trim as indicated on the Drawings.
7. Color to match roofing.

J. Roof Flashings:

1. Material: Prefinished Sheet Steel.
2. Thickness: 20 gauge/0.080 inches
5. Color to match roofing.

K. Through wall Scupper flashing:

1. Material: Stainless Steel Sheet.
2. Thickness: 20 gauge/0.080 inches
4. Corners: Fully-welded or soldered shop fabricated corners, ends and intersections.

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5. Color to match roofing.

L. CMU / CLT transition flashings

1. Material: Prefinished Sheet Steel.
2. Thickness: 24 gauge/0.080 inches
4. Corners: Fully-welded or soldered shop fabricated corners, ends and intersections.
5. Factory primed / coated to receive field painting.

END OF SECTION
SECTION 07 90 05

JOINT SEALERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Sealants for exterior surfaces.

B. Sealants for interior surfaces.

1.2 RELATED REQUIREMENTS

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

C. Preliminary Selection Sample: Manufacturer’s color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

D. Field Samples for Confirmation: provide sealant samples in the color selected based on Manufacturer’s charts for sealants other than the ones included in the Visual and Performance Mockup. Field samples shall be minimum 12 inches long and installed at joints intended for each particular sealant use. Mockup and field samples will be used to confirm sealant color selection.

E. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI’s Sealant Validation Program.

F. Manufacturer’s Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

G. Preconstruction Field Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in “Quality Assurance” Article.

H. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.

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2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

I. Field Test Report Log: For each elastomeric sealant application.

J. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

L. Maintenance Data: For users operation and maintenance of system including:

1. Methods for maintaining system's materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
3. Recommendations on maintenance schedule.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

B. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project. Minimum 5 years of documented experience in facilities of this size and scope.

1. Prequalification of single source installers for exterior sealants is encouraged.

C. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

D. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Submit not fewer than eight pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
5. Confirm compatibility with water repellents and cleaners.
E. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the Notice to Proceed with the Work.

1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.
5. Provide staining report for sealant and project substrates.

F. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:

1. Contractor and Owner's representative together shall locate test joints on the project.
2. Manufacturer's representative to conduct field tests for each application indicated below:
   a. Each type of elastomeric sealant and joint substrate indicated.
   b. Each type of nonelastomeric sealant and joint substrate indicated.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Arrange for tests to take place with joint-sealant manufacturer's technical representative present.
      1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
5. Prepare a written report as to whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.
7. Record test locations on Project Record Documents

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1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

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

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Ten (10) years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Joint sealers for properly designed joints in interior and exterior materials; selected for durability, movement capacity, adhesion to substrates and non staining characteristics.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
B. Colors of Exposed Joint Sealants As selected by Architect from manufacturer's full range for each location.

C. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

D. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.3 MATERIALS

A. Sealants for exterior surfaces:

1. (S-1): Silyl-terminated polyether elastomeric; ASTM C 920, Grade NS, Class 25, Uses NT, M, G, A and O; single, or multi-component.

2. (S-2): Silicone Sealant: ASTM C 920, Grade NS, Class 50, Uses NT, A, G, M, O; single component, general purpose, medium modulus, neutral curing, non-sagging, non-staining, non-bleeding.
   a. Movement Capability: +/- 50 percent.
   c. Product: 795 manufactured by Dow Corning.
   d. Designed for weather-proofing typical exterior materials including unprimed adhesion to anodized and fluoropolymer coated aluminum.

3. (S-3): Surface Modified Silicone Sealant: ASTM C 920, Grade NS, Class 50, Uses NT, A, G, M, O; single component, general purpose, medium modulus, neutral curing, non-sagging, non-staining, non-bleeding.
   a. Movement Capability: +/- 50 percent.
   c. Product: 756 manufactured by Dow Corning.
   d. Designed for weather-proofing sensitive porous stone and light colored metal panel substrates.

4. (S-4): Butyl Sealant: ASTM C 920, Grade NS, Class 12-1/2, Uses NT, M, A, G, O; single component, solvent release, non-hardening, non-drying, non-skinning, non-sagging.
   c. Product: SikaLastomer-511 by Sika.
d. Designed for concealed joints requiring non-drying sealant like lap joints in sheet metal flashing and trim.

5. (S-6): Preformed Compressible Foam Sealers.
   a. Movement +25%, -25% (50% total) - permanently elastic
   b. Color: Color as selected to match concrete.
   c. Product: THC 900-901 by Tremco Inc.

   1) Backerseal by Emseal.
   2) illmod 600 by Tremco Inc.

B. Sealants for interior surfaces:

   1. (S-10): General Purpose Interior Sealant: polyurethane; ASTM C 920, Grade NS, Class 25, Uses NT, M, G, A and O; single, or multi- component, paintable.
      b. Product: Dymonic FC, Dymeric 240FC by Tremco Inc.
      c. Designed for interior movement and non-moving joints adjacent to painted surfaces.

   2. (S-11): Tile Sealant: Silicone; ASTM C 920, Uses M and A; single component, mildew resistant.
      a. Colors other than white may be required.
      b. Product: Trade Mate Tub, Tile & Ceramic Silicone Sealant manufactured by Dow.

   3. (S-12): Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
      a. Product: Tremco "Acoustical Sealant".
      b. Tested as part of acoustical assemblies.

      a. Approved by manufacturer for wide joints up to 1-1/2 inches.
      c. Product: Vulkem 45 SSL by Tremco Inc.
      d. Designed for exposed, trafficked joints with pourable self-leveling installation.

2.4 ACCESSORIES

A. Joint sealant backing:
1. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

2. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) O (open-cell material) 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:

3. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

4. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

B. Miscellaneous Materials:

1. 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.

2. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

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

4. Natural Sand: Washed natural sand containing no contaminants that would affect the sealant. Color as approved by the architect for sanded joints as indicated or scheduled.

C. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

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3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 CLEANING

A. Dispose of all waste material in accordance with Section 017419 - Construction Waste Management and Disposal and project's Waste Management Plan.

3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.6 SCHEDULE

A. Sealants for exterior surfaces.

1. (S-1): Exterior joints occurring in paintable surfaces.
2. (S-2): Typical exterior weather-proofing joints including metal to metal, metal to glass and perimeters.
3. (S-3): Exterior weather-proofing joints including porous unit masonry, and concrete applications.
4. (S-3a): Exterior weather-proofing joints at ledger angles in masonry veneer. Sand appearance to match brick mortar appearance. Matching may require several iterations.
5. (S-4): Concealed sealants in sheet metal flashing, metal work and other joints calling for nonhardening, nonskinning, non-drying, nonmigrating sealant.
6. (S-6): Used as a secondary sealant behind directly-applied liquid sealant. Use at all joints larger than 3/4 inch in width as a secondary sealant.

B. Sealants for interior surfaces:

1. (S-10): Typical Interior Sealant: moving and non-moving Interior wall and ceiling control joints, smoke rated (but not fire rated) partitions.
3. (S-12): Use for concealed locations only. Sealant bead between top stud runner and structure and between bottom stud track and floor at any wall designated as acoustical.
4. (S-13): Control joints in floors.

END OF SECTION

09/30/19
SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Non fire rated steel doors.
B. Non fire rated steel frames.
C. Exterior steel frames.

1.2 RELATED REQUIREMENTS

A. 08 71 00 - Hardware: for hardware installed in hollow metal doors
B. 08 80 00 - Glazing: for glass in doors and borrowed lites.
C. 09 90 00 - Painting and Coating: for field painting.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes. Include U-value data for thermally broken doors and frames.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.
D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
E. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.
F. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

09/30/19
1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

B. As required by SMACNA Guideline Chapter 3 and Section 01 57 21 - Indoor Air Quality Controls.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Verify products have been stored, and will be installed, in accordance with project's Construction Indoor Air Quality Management Plan specified in Section 01 57 21 - Indoor Air Quality Controls.

B. Verify existing conditions meet the manufacturer's requirements before starting work.

2.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

B. Coat inside of frames to be installed in masonry, with bituminous coating, prior to installation.

C. Coat inside of other frames with bituminous coating to a thickness of 1/16 inch.

2.3 INSTALLATION

A. All adhesives, sealants, paints and coating applied on site must comply with the VOC limits and Submittal requirements for IEQ 4.1: For adhesives and sealants. IEQ 4.2 For Paints and Coatings, and IEQ 4.3 For Flooring and Systems (wall base) as specified in Section 013515 - LEED Certification Procedures.

B. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

C. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

D. Install fire rated units in accordance with NFPA 80.
E. Seal seam at top closures after finish is applied to create a smooth surface without groove or pits
   1. Seal with sealant Per 07 90 05 - Joint Sealers.

F. Pack all frames with insulation.

G. Coordinate installation of hardware.

H. Coordinate installation of electrical connections to electrical hardware items.

I. Touch up damaged factory finishes.

2.4 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

2.5 ADJUSTING

A. Adjust and lubricate hardware for proper operation.

B. Adjust for smooth and balanced door movement in accordance with manufacturer’s instructions.

2.6 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

2.7 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

2.8 SCHEDULE

A. Refer to door schedule on drawings.

END OF SECTION

09/30/19
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Wall access doors and panels.

1.2 RELATED REQUIREMENTS

A. 06 20 00 – Finish Carpentry: Openings in interior vertical wood siding panel.
B. 08 71 00 – Door Hardware: Cylinders for door.
C. 09 21 16 - Gypsum Board Assemblies Openings in partitions.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Sample: Submit one of each access unit, 12 x 12 inch in size illustrating frame configuration.
C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
D. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
E. Closeout Submittals: Project record documents recording actual locations of all access units.

1.4 MAINTENANCE MATERIAL

A. Any special tools to operate access doors and panels.
1.5 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Non-rated hinged doors and non-hinged panels in walls and ceilings for access to concealed building components.

2.2 MATERIALS

A. Wall access doors and panels.

1. Recessed Non-Fire Rated Door and Frame Units

a. Basis of Design Product:

1) In Wall Type 8 Partition:

a) Model NP-Series manufactured by Nystrom, Inc.

b) Model KRP350 manufactured by Karp Associates.

b. Features:

1) Frame: 1” Flange.
2) Hinges: Concealed.
3) Handle: No Handle.
4) Latch/Lock: prep for mortise lock.
5) Gasketing: Manufacturers' standard.
6) Material: Stainless Steel.
7) Finish: Manufacturers brushed finish.
8) Size(s): As indicated in the project documents.

2.3 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

B. Install frames plumb and level in openings.

3.4 ADJUSTING

A. Adjust and lubricate hardware for proper operation.

3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 08 33 13

COILING COUNTER DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Manual push-up steel counter doors with custom finish.

B. Related Section:
   1. 05 50 00 – Metal Fabrications for miscellaneous steel supports.
   2. 08 71 00 – Finish Hardware for key cylinders for locks.

1.2 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

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

C. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data. Include plans, elevations, sections, details, and attachments to other work.

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

E. Maintenance Data.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for both installation and maintenance of units required for this Project.

B. Manufacturer: Counter doors shall be manufactured by a firm with a minimum of five years experience in the fabrication and installation of counter doors. Manufacturers proposed for use, which are not named in these specifications, shall submit evidence of ability to meet performance and fabrication requirements specified, and include a list of five projects of similar design and complexity completed within the past five years.
C. Installer: Installation of counter doors shall be performed by an authorized representative of the manufacturer.

D. Single-Source Responsibility: Provide doors, guides, motors, and related primary components from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturer’s instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: 650 Series Rolling Steel Counter Doors by Overhead Door Corporation; Telephone 800-9293667; www.overheaddoor.com; or other reviewed and accepted.

2.2 COUNTER DOORS

A. Curtain: Interlocking slats, equal to Overhead Door Company Type F-128 slats fabricated of galvanized steel. Endlocks shall be attached to alternate slats to maintain curtain alignment and prevent lateral slat movement.

B. Guides: Powder coated steel shapes.

C. Brackets: Steel plate to support counterbalance, curtain and hood.

D. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel.

E. Hood: Galvanized primed steel hood. Provide intermediate support brackets as required. **Omit manufacturer’s logo on hood.**

F. Operation: Manual push up.

G. Bottom Bar: Steel tubular locking bottom bar with weatherstrip.

H. Locking: Slide bolt locks suitable for use with padlock.

I. Wall Mounting Condition: Face of wall mounting.

2.3 FINISH
A. Slats and hood shall be galvanized steel in accordance with ASTM A525 and receive rust-inhibitive, roll coating process including bonderizing, 0.2 mils thick baked-on prime paint and baked on powder coating applied to entire door system including slats, guides, bottom bar and head plate. Powder coat equal to Overhead Door Company “PowderGuard Max” finish.

B. Non-galvanized exposed ferrous surfaces shall receive on coat of rust inhibitive primer.

C. Color: Powder coated finish in color as selected by Architect from manufacturer’s standard colors.

D. Finish shall not hinder smooth and proper operation of door.

PART 3 - EXECUTION

3.1 PREPARATION

A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Strictly comply with manufacturer’s installation instructions and recommendations. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

B. Instruct Owner’s personnel in proper operating procedures and maintenance schedule.

3.3 ADJUSTING AND CLEANING

A. Test rolling counter doors for proper operation and adjust as necessary to provide proper operation without binding or distortion.

B. Touch-up damaged coatings and finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or product being cleaned.

END OF SECTION

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SECTION 085113

ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Aluminum windows.

B. Operating hardware.

1.2 RELATED REQUIREMENTS

A. 07 90 05 – Joint Sealers: Sealing joints between window frames and adjacent construction.

B. 08 80 00 – Glazing: Glass for windows

1.3 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.


1.4 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For manufacturer and installer.

C. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.
D. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving weather barrier seal to adjacent construction, anchorage locations, and installation requirements.

E. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
   1. Evidence of AAMA Certification.
   2. Evidence of WDMA Certification.
   3. Evidence of CSA Certification.
   4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

F. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

G. Manufacturer’s Installation Instructions: Include complete preparation, installation, and cleaning requirements.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of AAMA CW-10.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.7 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.8 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion.
B. Provide ten-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

C. Provide five-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 1 - PRODUCTS

1.9 DESCRIPTION

A. Thermally broken in-swing aluminum casement window.

1.10 MANUFACTURERS

A. Basis of Design: EFCO Series 2700.


C. Substitutions: See Section 01 61 00 – Substitution Request Form.

1.11 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209 (ASTM B209M), 5005 alloy, H12 or H14 temper.

C. Concealed Steel Items: Profiled to suit mullion sections; galvanized in accordance with ASTM A123/A123M.

1.12 WINDOWS

A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.

1. Frame Components: 6063-T6 aluminum alloy.

2. Standard frame width: 2 inches.

3. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.

4. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
5. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.

6. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Performance Requirements: Provide products that comply with the following:

   1. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
   2. Air infiltration: less than .10 CFM/SF @ 6.24 PSF
   3. Water: No Leakage @ 12.0 PSF

C. In-swinging Casement Type:

   2. Glazing: Single; clear; transparent, in accordance with Section 08 80 00 – Glazing.
   4. Interior Finish: Class I natural anodized.
   5. Provide with window manufacturer’s sill, jamb and head receptors.
   6. Provide with window manufacturer’s 3 and ½ inch deep aluminum sill with ¾ inch downward sill extension.

1.13 COMPONENTS

   A. Frames: 2 inch wide by 2 inch deep profile, of 2 inch thick section; flush glass stops of snap-on type.

   B. Glazing: As specified in Section 08 80 00 – Glazing.

      1. For Exterior Windows: Type Tempered as indicated.

   C. Operable Sash Weatherstripping: Wool pile; permanently resilient, profiled to achieve effective weather seal.

1.14 HARDWARE

   A. Sash lock: Lever handle with cam lock.

   B. Operator: Lever action handle fitted to projecting sash arms with limit stops.

1.15 FINISHES

   A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.
B. Finish Color: As selected by Architect from manufacturer's standard range.

C. Glass: As indicated in Section 08 80 00 – Glazing.

D. Apply 1 coat of bituminous coating to concealed aluminum and steel surfaces in contact with dissimilar materials.

PART 2 - EXECUTION

2.1 INSTALLATION

A. Install windows in accordance with manufacturer's instructions.

B. Attach window frame, head sill, jamb receivers and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install sill and sill end angles.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Install operating hardware not pre-installed by manufacturer.

G. Install glass in accordance with requirements specified in Section 08 80 00 – Glazing.

2.2 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

2.3 CLEANING

A. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

B. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

C. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION

09/30/19
SECTION 08 71 00
HARDWARE

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Locks and latches.
B. Hinges.
C. Mortise locksets.
D. Exterior sliding door hardware.
E. Gasketing and thresholds.
F. Finishes.

1.2 RELATED REQUIREMENTS
A. 07 62 00 – Sheet Metal Flashing and Trim
B. 08 11 13 – Hollow Metal Doors and Frames.
C. 08 31 00 – Access doors and Frames: Cylinder for access door.

1.3 ADMINISTRATIVE REQUIREMENTS
A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section 01 30 00 - Administrative Requirements.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.
B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
C. Coordinate Owner's keying requirements with hardware manufacturers.

1.4 SUBMITTALS
A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

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B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.

C. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.

D. Keying Schedule: Submit for approval of Owner.

E. Prior to preparation of hardware schedule:
   1. Submit one (1) sample of hinge, latchset, lockset, and closer illustrating style, color, and finish.
   2. Samples will be returned to supplier.

F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

H. Maintenance Data: For users operation and maintenance of system including:
   1. Manufacturer's parts lists and templates.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

I. Closeout Submittals: Deliver keys with identifying tags to Owner by security shipment direct from hardware supplier.

J. Project Record Documents: Record actual locations of concealed equipment, services, and conduit.

1.5 MAINTENANCE MATERIAL

A. Extra Lock Cylinders: Ten for each master keyed group.

B. Tools: One set of all special wrenches or tools applicable to each different or special hardware component, whether supplied by the hardware component manufacturer or not.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years’ experience.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum of 5 years’ experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

B. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Mechanical hardware for swinging doors, sliding doors and gates.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Means of Egress Doors: Latches do not require more than 15 lbf to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the DOJ's 2010 ADA Standards for Accessible Design.

C. Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.

D. Provide items of a single type of the same model by the same manufacturer.

2.3 MANUFACTURERS

A. Specification is based on product types listed in hardware groups in the contract drawings, from the specific manufacturers listed below.

2.4 LOCKS AND LATCHES

A. Specification is based on product types listed in hardware groups in the contract drawings, from the manufacturers listed below.

B. Approved Manufacturers: Best, Schlage (w/ Best compatible IC cores)

C. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.

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1. Hardware Sets in the contract documents indicate locking functions required for each door.
2. If no hardware set is indicated for a swinging door provide an office lockset.
3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.
5. In door sections, where a lock cylinder referenced to this Section is specified, furnish and install a mortise lock cylinder keyed to the building keying system.

D. Lock Cylinders: Manufacturer’s standard tumbler type, figure 8 locksets with 7-pin Best interchangeable core cylinders.

   1. Provide cams and/or tailpieces as required for locking devices required.
   2. In addition to where indicated in hardware schedule in the project drawings provide an additional cylinder for access door.

2.5 HINGES

A. Specification is based on product types listed in hardware groups in the contract drawings, from the manufacturers listed below.

B. Approved Manufacturers: Stanley, Lawrence, McKinney

C. Self Closing Hinges: Comply with BHMA A156.17.

D. Hinges: Provide hinges on every swinging door.

   1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2. Provide ball-bearing hinges at all doors having closers.
   3. Provide hinges in the quantities indicated.
   4. Provide non-removable pins on exterior outswinging doors.
   5. Where electrified hardware is mounted in door leaf, provide power transfer hinges.

E. Butt Hinges: Comply with BHMA A156.1 and A156.7; standard weight, unless otherwise indicated.

   1. Provide hinge width required to clear surrounding trim.

F. Quantity of Hinges Per Door:

   1. Doors up to 60 inches High: Two hinges.
   2. Doors from 60 inches High up to 90 inches High: Three hinges.
   3. Doors 90 inches High up to 120 inches High: Four hinges.
   4. Doors over 120 inches High: One additional hinge per each additional 30 inches in height.
2.6 MORTISE LOCKSETs

A. Specification is based on product types listed in hardware groups in the contract drawings, from the manufacturers listed below.

B. Approved Manufacturers: Best, Schlage (w/ Best compatible IC cores)

C. Mortise Locks: BHMA A156.13; stamped steel case with steel or brass parts; Series 1000.

D. Locking Functions: As defined in BHMA A156.13, and as follows:

1. Passage: F01.
2. Privacy: F19, or F02 with retraction of deadbolt by use of inside lever/knob.
3. Office: F04, key not required to lock, remains locked upon exit.
4. Classroom: F05, key required to lock.
5. Communicating: F03, deadbolts operated independently from each side, not an exit.
6. Entry, Deadbolt: F20, may be locked without key, free egress.
7. Always-Locked: F07, may not be left unlocked.
8. Two-Key Entry: F09, outside locked by key from both sides, free egress.
9. Store Door: F14, deadbolt locked by key from both sides, not an emergency exit (must be unlocked during occupied hours).
10. Exit Only: F07 or F31, may have outside trim, may not be left unlocked.

2.7 EXTERIOR SLIDING DOOR HARDWARE

A. Specification is based on product types listed in hardware groups in the contract drawings, from the manufacturers listed below.

B. Approved Manufacturers: Basis of Design - Crown Industrial, Henderson, or Approved Equal.

C. Sliding Door Hardware Features:

1. Weight allowance: All sliding door components sized for min 1000 pound capacity.

2. Track Type: 10 gauge metal track. Length as required. Provide multiple track sections as required to attain required length. Furnish end blinds at track ends. Furnish concealed track mounted door stops at each door stop location. Galvanized finish. Use equal length track sections where possible.


4. Box Track Brackets: Top or side mount as required by the application. Utilize lock joint brackets to join sections of track and center stop brackets where required. Galvanized Finish.

5. Furnish concealed stay roller and channel at each door bottom.
2.8 GASKETING AND THRESHOLDS

A. Gaskets: Complying with BHMA A156.22.

1. Specification is based on product types listed in hardware groups in the contract drawings, from the manufacturers listed below.
2. Approved Manufacturers: Pemko, Reese, National Guard
3. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
   a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
4. On each exterior door, provide door bottom sweep, unless otherwise indicated.

B. Thresholds: Complying with BHMA A156.21.

1. Specification is based on products types listed in hardware groups in the contract drawings, from the manufacturers listed below.
2. Approved Manufacturers: Pemko, Reese, National Guard
3. At each exterior door, provide a threshold unless otherwise indicated.
4. Field cut threshold to frame for tight fit.

2.9 FINISHES

A. Provide finishes complying with BHMA A156.18, US26D unless otherwise noted except:

1. Door Closers – painted to match adjacent door.

2.10 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer’s requirements before starting work.

B. Verify that doors and frames are ready to receive work; labeled, fire rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

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3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer’s instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer’s instructions based on conditions present.

B. Use templates provided by hardware item manufacturer.

C. Do not install surface mounted items until finishes applied to substrate are complete.

D. Install hardware on fire rated doors and frames in accordance with code and NFPA 80.

E. Mounting heights for hardware from finished floor to center line of hardware item.
   1. For steel doors and frames: Comply with DHI "Recommended Locations for Architectural Hardware for Steel Doors and Frames."
   2. For Wood Doors: Comply with DHI "Recommended Locations for Architectural Hardware for Wood Flush Doors."

F. Set exterior door thresholds with full-width bead of elastomeric sealant on each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.4 FIELD QUALITY CONTROL

A. Provide an Architectural Hardware Consultant to inspect installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer’s instructions and as specified.

3.5 ADJUSTING

A. Adjust and lubricate hardware for proper operation.

3.6 CLEANING

A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer’s instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer’s level of finish quality.

3.7 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.
3.8 SCHEDULE

A. Hardware schedule included in the Drawings.

END OF SECTION
SECTION 08 80 00
GLAZING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Delegated design of glazing units.

B. Glass glazing.

C. Glazing units.

1.2 RELATED REQUIREMENTS

A. 08 11 13 - Hollow Metal Doors and Frames: for assembly requiring components from this section.

B. 08 14 16 - Flush Wood Doors: for assembly requiring components from this section.

C. 08 83 00 - Mirrors: for framed glass mirrors.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For Installer, fabricator and design engineer.

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

D. Product Data:

1. Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.

2. Glazing Compounds & Accessories: Provide chemical, functional, and environmental characteristics, limitations, special application requirements and identify available colors.

E. Shop Drawings: For any glazing installed with components from this section alone.

1. Submit shop drawings for glazing installed within other systems in accordance with the system submittal requirements.

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F. Sample: Submit two samples in manufacturer's standard size of glass type units, showing coloration and design.

G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

I. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE

A. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years' experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

A. Sealed Insulating Glass Units: Provide a ten (10) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.

B. Tempered Glass: Provide a ten (10) year warranty including replacement of failed units.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Glass glazing and accessories installed as monolithic glazing, glazing units, or horizontal glazing within framing systems and support structures specified elsewhere.
2.2 PERFORMANCE AND DESIGN CRITERIA

A. By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

B. Roll Wave Maximum Distortion Tolerance: 0.003 inch target with 0.005 inch maximum peak to valley measurement.

C. Bow and Warp Maximum Tolerance: 50 percent of the maximum allowed in ASTM C 1048.

D. Thickness: As required for loads indicated.

E. Deflection no greater than 1/175 of the longest dimension or 1/2 inch whichever is less.

2.3 MATERIALS

A. Float Glass:

   1. Performance Criteria:
      
      a. By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
      b. Roll Wave Maximum Distortion Tolerance: 0.003 inch target with 0.005 inch maximum peak to valley measurement.
      c. Bow and Warp Maximum Tolerance: 50 percent of the maximum allowed in ASTM C 1048.
      d. Tinted Types: Performance and features to match basis of design product.

   2. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
   3. Heat-Strengthened in accordance with ASTM C1048.
   4. Fully Tempered in accordance with ASTM C1048.

      a. Safety Glazing: Comply with 16 CFR 1201 test requirements for Category II.

B. Tempered Glass: Float glass laminated in accordance with ASTM C1172.

   1. Performance Criteria:

      a. Safety Glazing: Comply with 16 CFR 1201 test requirements for Category II.

PART 3 - EXECUTION

09/30/19
3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.5 SCHEDULE

A. Monolithic Tempered Glass:

1. Applications: All interior applications requiring safety glazing, exterior window.
2. Glass: Clear, fully tempered as indicated on the Window Schedule on the Drawings.
3. Thickness: As required by panel size indicated when designed in accordance with performance criteria.

END OF SECTION
SECTION 08 91 00

LOUVERS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fixed louvers.

1.2 RELATED REQUIREMENTS

A. 07 62 00 - Sheet Metal Flashing and Trim.

B. 07 90 05 - Joint Sealers.

C. Division 23: Louver performance requirements.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For manufacturer.

C. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

D. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.

E. Sample: Submit two samples 4 inch x 6 inches in size illustrating finish and color of exterior and interior surfaces.

F. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

G. Maintenance Data: For users operation and maintenance of system including:

1. Methods for maintaining system's performance, materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
3. Recommendations on maintenance schedule.
1.4 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY

A. Manufacturer’s Finish Warranty: Correct defective work within a 20 year period after Substantial Completion for degradation of panel finish, including color fading caused by exposure to weather.

1. Panel Finish Criteria are listed AAMA 2605.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Factory fabricated and assembled architectural louvers including fixed types.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. AMCA Certified in accordance with AMCA 511.

B. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf without damage or permanent deformation.

C. Intake Louvers: Design to allow maximum of 0.01 oz/sq ft water penetration at 850 feet per minute, when tested in accordance with AMCA 500-L.

D. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.

E. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

2.3 FIXED LOUVERS

A. Drainable Blade Fixed Louver, Custom Shape:

1. Basis of Design Product: Custom triangular shape Greenheck Model EDD-401 with blank off panels. Comparable and substituted products will be judged based on the following performance criteria, features, warranty, and qualifications.

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2. Performance Criteria: Refer to mechanical requirements.

3. Features:
   a. Custom triangular shape to fit into triangular opening in cross laminated timber wall.
   b. Blades: Drainable.
   c. Frame: 4 inches deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
   d. Aluminum Thickness: Frame 12 gage, 0.0808 inch minimum; blades 12 gage, 0.0808 inch minimum.
   e. Finish: Prefinished, manufacturer's flat black.
   f. Blank off panels: As required to marry triangular louver with duct.
   g. Attached with clip angles on the interior.

2.4 SPECIALTY LOUVERS

A. Brick Vent:
   1. Basis of Design Product: Greenheck Model BE. Comparable and substituted products will be judged based on the following performance criteria, features, warranty, and qualifications.

   2. Performance Criteria: Refer to Mechanical requirements.

   3. Features:
      a. Size as indicated in mechanical drawings.
      b. Blades: Heavy gauge extruded 6063T5 aluminum, 0.125 inches nominal wall thickness, positioned at 45 degree angles.
      c. Frame: Heavy gauge extrude 6063T5 aluminum, 4 inches by 0.125 inch nominal wall thickness.
      d. Finish: Clear anodized aluminum.
      e. Course into concrete masonry wall.
      f. Furnish with .063 thickness aluminum duct, sized to extend 2" off the face of wall.
      g. Where brick vent is to be installed in and exterior wall furnish with insect screen.

2.5 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Blank-Off Panels: Same material as louver, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.
C. Bird Screen: Interwoven wire mesh of steel, 14 gage, 0.0641 inch diameter wire, 1/2 inch open weave, diagonal design.

D. Fasteners and Anchors: Stainless steel.

E. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.

F. Sealant: type, as specified in 07 90 05 – Sealants.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

B. Install perimeter sealant and backing rod in accordance with Section 07 90 05.

C. Coordinate with installation of mechanical ductwork.

D. Coordinate with installation of louver actuators.

3.4 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.5 SCHEDULE

A. Refer to Louver schedule on mechanical drawings and louvers indicated on mechanical plans.

END OF SECTION
SECTION 092116
GYPSUM BOARD ASSEMBLIES

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Gypsum Board.

1.2 RELATED REQUIREMENTS
A. 07 90 05 – Joint Sealers
B. 09 90 00 – Painting and Coating

1.3 SUBMITTALS
A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Qualification Data: For Installer.
C. Product Data: Provide data on gypsum board, accessories, joint finishing system.
D. Test Reports: For all stud framing products that do not comply with ASTM C645 or C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.4 QUALITY ASSURANCE
A. Designer Qualifications: Professional structural engineer with 5 years of documented experience in design of this work and licensed in the location of the project.
B. Moisture Resistant Gypsum Board:
   1. ASTM C630, standard type, Type X fire-rated, water-resistant gypsum board shall be used as indicated on the Drawings in areas of high humidity.
   2. Products:
1.5 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Finishing Accessories:
   1. ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
      a. Types: As detailed or required for finished appearance.
      b. Special Shapes: Conventional cornerbead, J-mold and control joints.

C. Joint Materials:
   1. ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
      a. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
      c. Exterior Soffits: Chemical hardening type compound.

D. Anchorage to Substrate:
   1. Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

PART 2 - EXECUTION

2.1 EXAMINATION

A. Verify existing conditions meet the manufacturer’s requirements before starting work.

2.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

2.3 INSTALLATION

A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

B. Comply with ASTM C 840 and GA-216. Install to minimize butt end joints, especially in highly visible locations.
2.4 INSTALLATION OF TRIM AND ACCESSORIES

A. Corner Beads: Install at external corners, using longest practical lengths.

B. J-mold: Install at locations where gypsum board abuts dissimilar materials and as indicated on the Drawings.

2.5 JOINT TREATMENT


B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 2: In utility areas and chases.
   2. Level 4: Walls and ceilings as indicated on the Drawings.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

2.6 FIELD OBSERVATION AT "PUNCH"

A. Finish will be judged from a viewing difference of 4 feet.

B. Finished lighting system or temporary lighting similar to proposed finished lighting should be used for judging the wall.

C. Eye catching discrepancies and or blemishes, including “fuzzy” wall board surfaces, will be rejected.

2.7 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

2.8 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION

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PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Resilient base.

B. Resilient installation accessories.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with 01 31 00 – Project Coordination.

1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For Installer.

C. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

D. Shop Drawings: Indicate seaming plan.

E. Base and Accessory Samples: Submit manufacturer's complete set of color samples for initial selection.

F. Certificate: Prior to installation of flooring, submit written certification by flooring manufacturer and adhesive manufacturer that condition of sub-floor is acceptable.

G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner’s name and registered with manufacturer.

I. Maintenance Data: For users operation and maintenance of system including:

1. Methods for maintaining system's materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
3. Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.4 MAINTENANCE MATERIAL

A. Maintenance Materials: Furnish the following for Owner’s use in maintenance of project.

1. Extra Wall Base: 10 linear feet of each type and color.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

1.6 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.7 WARRANTY

A. Provide minimum Manufacturers Limited 5 year commercial warranty for manufacturing defects.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Resilient base and installation accessories for transition to other flooring types.

B. Resilient Base: ASTM F 1861, Type TS rubber, vulcanized thermoset, top set Style.
2.2 PERFORMANCE AND DESIGN CRITERIA

A. Critical Radiant Flux (CRF): Minimum 0.45 watt per square centimeter, when tested in accordance with ASTM E 648 or NFPA 253.

2.3 RESILIENT BASE

A. Resilient Base (RB): ASTM F1861, top set Style B cove, and as follows:

1. Basis of Design product, color, height and profile: Burke Flooring, 217 Charcoal
2. Height: 4 inch.
3. Thickness: 0.125 inch thick.
5. Length: Roll (4 foot sections are not acceptable except as maintenance stock.)
6. Comparable products by one of the following are also acceptable.


7. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 – Substitution Request Form.

2.4 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Primers, Adhesives, and Seaming Materials:

1. Waterproof; types recommended by flooring manufacturer.

C. Filler for Coved Base:

1. Plastic.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify existing conditions meet the manufacturer’s requirements before starting work.

B. Verify that wall surfaces are smooth and flat within the tolerances specified, are dust-free, and are ready to receive resilient base.
3.2 PREPARATION

A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION

A. General:
   1. Install all materials in accordance with manufacturer's instructions based on conditions present.
   2. Starting installation constitutes acceptance of sub-floor conditions.
   3. Fit joints tightly.

B. Resilient Base:
   1. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
   2. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold and securely wrap with a minimum distance of 12 inches.
   3. Install base on solid backing. Bond tightly to wall and floor surfaces.
   4. Scribe and fit to door frames and other interruptions.

3.4 CLEANING

A. Dispose of all waste material in accordance with 01 74 19 - Construction Waste Management and Disposal and project's Waste Management Plan.

B. Remove excess adhesive from floor, base, and wall surfaces without damage.

C. Initial cleaning and finishing is the responsibility of the contractor.
   1. Follow manufacturer's recommendations for initial cleaning and finishing procedures.
   2. Not all types of flooring require finishing.

3.5 PROTECTION

A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 09 90 00
PAINTING AND COATING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Interior paint and clear spar urethane systems.
B. Exterior paint, stain, and clear spar urethane systems.

1.2 RELATED REQUIREMENTS

A. 05 05 00 – Metal Fabrications
B. 06 19 04 – Cross Laminated Timber
C. 07 46 23 – Wood Siding
D. 09 21 16 – Gypsum Board Assemblies

1.3 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with 01 31 20 – Project Meetings.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.4 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Product Data: Provide product criteria, characteristics, accessories, jointing and seaming methods, and termination conditions.
C. Sample: Submit three paper chip samples, 8.5 x 11 inch in size illustrating range of colors and textures available for each surface finishing product scheduled.
D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.
E. Maintenance Data: For users operation and maintenance of system including:

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1. Methods for maintaining system's materials and finishes.
2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
3. Recommendations on maintenance schedule.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of paint and coating products used in the work of this section with minimum ten years of experience.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.6 MOCK-UP

A. Paint one wall (from corner to corner) of selected rooms to serve as a mock up.

B. Locate where directed.

C. Mock-up may remain as part of the Work if accepted.

1.7 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; unless noted otherwise below.

B. Paints:

1. Pkr: Comex Group (Color Wheel, Frazee, General Paint, Kwal, or Parker): www.thecomexgroup.com
4. Rodda: Rodda (Cloverdale, Zinsser, XIM) www.roddapaint.com
6. Tnemec: Tnemec www.tnemec.com

C. Low VOC Exterior Paints for Stick Garden landscape feature:

1. ECOS Paints: www.ecospaints.net

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2. Behr Paints: www.behr.com

D. Stains:


E. Clear Spar Urethane Sealers:


F. Substitutions for products by manufacturers other than those listed above: See 01 61 00 – Substitution Request Form.

2.2 DESCRIPTION

A. Surface preparation and field application of paints, stains, spar urethane, and other coatings.

B. High commercial quality coating systems for gypsum, wood, ferrous and non-ferrous metal by Sherwin-Williams, Benjamin Moore & Co. or comparable manufactures.

1. Paint finish for GWB: (3 coat system) primer + minimum 2 color coats. Gloss level at walls = satin (MPI G4). Gloss level at ceilings = satin (MPI G4).
2. Paint finish on doors and frames = semigloss (MPI gloss level G5).
3. Paint finish on fabricated steel items = satin (MPI gloss level G4).
4. See Drawings and Schedules for paint location and color.


D. Exterior Metals: Low VOC three-coat high performance paint system for exterior metals with semi-gloss finish and UV-protection

1. Basis of Cost: Tnemec or approved equal.

E. Stains: Two-coat high performance semi-transparent stain system for exterior siding and UV-protection.

F. Clear Spar Urethane Sealer: Low VOC two-coat high performance oil based exterior spar urethane sealer system for interior and exterior wood ceilings with clear satin finish, UV-protection with mold and mildew resistance.

G. Exterior Stick Garden: Low VOC two coat paint system for stick garden landscape feature.

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2.3 MATERIALS

A. Paint Systems:

1. PS-01 Acrylic-Enamel.
   a. Substrate: Concrete, Concrete Masonry Units, Gypsum Board.
   b. Benjamin Moore & Company:
      1) Primer: 046 Fresh Start 100% Acrylic Superior Primer
      2) Top coat: 526 Aura Waterborne Satin (2 coats min.)

2. PS-02 Urethane Finish.
   a. Substrate: Ferrous, and Zinc-Coated Metals:
   b. Benjamin Moore & Company:
      1) Primer: HP04 Ultra Spec HP Acrylic Metal Primer.
      2) Top coat: M735 Super Spec HP Waterborne Urethane Semi-Gloss

3. PS-03 Acrylic Latex Coating
   a. Substrate: Concrete, Concrete Masonry Units.
      1) Benjamin Moore & Company:
         a) Primer: 609 Ultra Spec Masonry Acrylic High Build Masonry Primer
         b) Top coat: 609 Ultra Spec Masonry Elastomeric Coating (2 coats min.)
      2) Sherwin Williams
         a) Primer: Loxon Concrete & Masonry Primer/Sealer, LX02W0050.
         b) Top Coat: ConFLEX XL Elastomeric High Build Coating, A5-400 Series.

4. PS-04 Acrylic Latex
   a. Substrate: Exposed Overhead Work
   b. Benjamin Moore & Company
      1) Primer: 027 Sure Seal Latex Primer Sealer
      2) Top coat: Ultra Spec EXT Exterior, N448
   c. Sherwin Williams
      1) Primer: Pro Industrial Multi-Surface Acrylic, B66 T 1564 Series
      2) Top coat: Spraylastic Exterior Waterborne Dry Fall, B42 T 17 Series

5. PS-05 Pavement Marking Paint
   a. Substrate: Concrete.
   b. Benjamin Moore & Company:

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1) Yellow: M58 Safety & Zone Marking Paint Yellow.
2) White: M58 Safety & Zone Marking Paint White.

c. Sherwin-Williams:

1) White: Pro-Park Traffic Marking Paint, B97 Series.
2) Yellow: Pro-Park Traffic Marking Paint, B97 Series.

6. PS-06: Exterior Stick Garden Landscape Feature Paint

a. Substrate: Wood

b. ECOS:

1) Primer: ECOS Wood Primer
2) Top Coat: ECOS Exterior Porch & Floor Paint.

c. Behr:

1) Primer: Behr Premium Plus Exterior Multi-surface primer.
2) Top Coat: Behr Premium Plus Ultra low-VOC paint, Semi-gloss Exterior Paint

B. Exterior Stain Systems:

1. PS-08: Semi-Transparent Stain

a. Substrate: Wood Horizontal Channel Siding.

b. Cabot:

1) First Coat: Cabot, mix 50% Dark Slate and 50% Foothill.
2) Second Coat: Cabot mix 50% Dark Slate and 50% Foothill.

C. Exterior Spar Varnish Systems:

1. PS-09: Spar Varnish


b. Varathane:

1) First Coat: Varathane Ultimate Spar Varnish 2 mils dft
2) Second Coat: Varathane Ultimate Spar Varnish 2 mils dft

2.4 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.

B. Manufacturer's optional accessories required by the project:

PART 3 - EXECUTION

09/30/19
3.1 EXAMINATION
   A. Verify existing conditions meet the manufacturer’s requirements before starting work.

3.2 PREPARATION
   A. Prepare surfaces to receive work in accordance with manufacturer’s instructions.

3.3 INSTALLATION
   A. General: Install all materials in accordance with manufacturer’s instructions based on conditions present.

3.4 PROTECTION
   A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.5 SCHEDULE
   A. Interior Coating Systems:
      1. Interior:
         a. Typical CMU Walls:
            1) System: PS-01 Acrylic-Enamel.
            2) Sheen: Satin
            3) Color: As indicated on the Drawings and Schedule these specifications.
            4) Location: Storage 104, Storage 109
         b. Typical CLT Ceilings and CLT Walls above CMU walls:
            1) System: PS-09 Spar Varnish.
            2) Sheen: Satin
            3) Color: Clear
            4) Location: Restroom 101, Restroom 103, Women’s R.R. 105, Men’s R.R. 107, Locker RM. 110, Life Guard 111
         c. Gypsum Board - Ceilings:
            1) System: PS-01 Acrylic-Enamel.
            2) Sheen: Satin
            3) Color: As indicated on the Drawings and Schedule these specifications.
            4) Location: Chase 102
         d. Gypsum Board - Walls:
1) System: PS-01 Acrylic-Enamel.
2) Sheen: Satin
3) Color: As indicated on the Drawings and Schedule these specifications.
4) Location: Restroom 101, Chase 102, Restroom 103, Locker RM. 110, Life Guard 111

e. Open to Structure Wood – Ceiling:

1) System: PS-04 Acrylic-Latex.
2) Sheen: Satin
3) Color: As indicated on the Drawings and Schedule these specifications.
4) Location: Storage 104, Chase 106, Rentals 108, Storage 109

f. Open to Structure Wood – Walls:

1) System: PS-04 Acrylic-Latex.
2) Sheen: Satin
3) Color: As indicated on the Drawings and Schedule these specifications.
4) Location: Rentals 108, Storage 109

g. Steel: Privacy Screen Bench Support/Overhead HSS, Sink Brackets, Bench Brackets, Counter Brackets:

1) System: PS-02 Urethane Finish
2) Sheen: Satin
3) Color: As indicated on the Drawings and Schedule these specifications.
4) Location: Women’s R.R. 105, Men’s R.R. 107, Locker RM. 110, Life Guard 111

h. Interior Woodwork: Privacy Screens/Benches, Wood Bench:

1) System: PS-09 Spar Varnish
2) Sheen: Satin
3) Color: Clear
4) Location: Women’s R.R. 105, Men’s R.R. 107, Locker RM. 110

B. Exterior Coating Systems:

1. Exterior:
   a. Exterior CMU Walls:

1) System: PS-03 Acrylic-Latex Coating
2) Sheen: Eggshell
3) Color: As indicated on the Drawings and Schedule these specifications.
4) Location: Restroom 101, Chase 102, Restroom 103, Women’s R.R. 105, Men’s R.R. 107, Locker RM. 110, Life Guard 111

b. Typical CLT Ceilings and Overhangs at Pavilions:

1) System: PS-09 Spar Varnish.

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2) Sheen: Satin
3) Color: Clear
4) Location: Pavilion West, Pavilion East.

c. CLT Steel Baseplate at CMU walls, Steel Roof Shoe at Pavilion:
   1) System: PS-02 Urethane Finish
   2) Sheen: Satin
   3) Color: As indicated on the Drawings and Schedule these specifications.
   4) Location: Restroom 101, Chase 102, Restroom 103, Women’s R.R. 105, Men’s R.R. 107, Locker RM. 110, Life Guard 111

d. Horizontal Channel Wood Siding:
   1) System: PS-08 Semi-Transparent Stain
   2) Color: As indicated on the Drawings and Schedule these specifications.
   3) Location: Storage 104, Chase 106, Rentals 108, Storage 109

C. Colors:
1. Locations indicated on the Drawings.
   
a. P1: Reference Color, Sherwin Williams, Zurich White – SW7626
      1) Chase 102: Walls, Ceiling, Door and Frame
      2) Storage 104: Walls and Ceiling
      3) Chase 106: Ceiling
      4) Rentals 108: Walls and Ceiling
         Storage 109: Walls and Ceiling
   
b. P2: Reference Color, Sherwin Williams, Capri – SW6788
      1) Restroom 101: GWB Walls
      2) Restroom 103: GWB Walls
      3) Locker RM. 110: GWB Walls
      4) Life Guard 111: GWB Walls
   
c. P3: Reference Color, Sherwin Williams, Iron Ore – SW7069
      1) Restroom 101: Door and Frame
      2) Restroom 103: Door and Frame
      3) Women’s R.R. 105: CLT Base Plate
      4) Chase 106: Door and Frame
      5) Men’s R.R. 107: CLT Base Plate
      6) Pavilion West: Steel Roof Shoe
      7) Pavilion East: Steel Roof Shoe
      8) Women’s R.R. 105: Privacy Screen Bench Support/Overhead HSS
      9) Men’s R.R. 107: Privacy Screen Bench Support/Overhead HSS
      10) Women’s R.R. 105: Sink Brackets
      11) Men’s R.R. 107: Sink Brackets
      12) Locker RM. 110: Bench Brackets

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13) Life Guard 111: Counter Brackets, Door and Frame

d. P4: Reference Color, Sherwin Williams, Caviar – SW6990

1) Restroom 101: Exterior Walls
2) Chase 102: Exterior Walls
3) Restroom 103: Exterior Walls
4) Women’s R.R. 105: Exterior Walls
5) Men’s R.R. 107: Exterior Walls
6) Locker RM. 110: Exterior Walls
7) Life Guard 111: Exterior Walls

e. P5: Reference Color, Sherwin Williams, Stardew – SW9138

1) Restroom 101: Door and Frame
2) Restroom 103: Door and Frame
3) Life Guard 111: Door and Frame

f. ST1: Reference Coating, Cabot, 50% Dark Slate and 50% Foothill

1) Storage 104: Exterior Walls and Sliding Door
2) Chase 106: Exterior Walls
3) Rentals 108: Exterior Walls and Sliding Doors
4) Storage 109: Exterior Walls and Sliding Door

g. CS1: Reference Coating, Varathane Ultimate Spar Varnish, Clear

1) Restroom 101: CLT Ceiling and CLT Walls
2) Restroom 103: CLT Ceiling and CLT Walls
3) Women’s R.R. 105: CLT Ceiling and CLT Walls, Privacy Screen/Benches
4) Men’s R.R. 107: CLT Ceiling and CLT Walls, Privacy Screen/Benches
5) Locker RM. 110: CLT Ceiling and CLT Walls, Bench
6) Life Guard 111: CLT Ceiling and CLT Walls
7) Pavilion West: CLT Ceilings and Exposed Wood
8) Pavilion East: CLT Ceilings and Exposed Wood

END OF SECTION
SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Delegated design of signage and supports.

B. Dimensional character signs.

C. Panel Signs.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section in accordance with Section - Administrative Requirements.

1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Qualification Data: For fabricator and design engineer.

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

D. Product Data: Provide product criteria, characteristics, accessories, jointing and attachment methods.

E. Shop Drawings:

1. Show sign mounting heights, locations of supplementary supports, and accessories.

2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.

F. Sample: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
1. Aluminum: For each form, finish, and color, on 6-inch-long sections of extrusions and squares of sheet at least 4 by 4 inches.
2. Acrylic Sheet: 8 by 10 inches for each color required.
3. Panel Signs: Not less than 12 inches square for each type.
4. Accessories: One of each, for each type.

G. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

H. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.
   3. Include manufacturers' brochures and parts lists describing the actual materials installed.

1.4 QUALITY ASSURANCE

A. Designer Qualifications: Professional structural engineer with 5 years of documented experience in design of this work and licensed in the location of the project.

B. Fabricators Qualifications: Company specializing in performing the work of this section with minimum 5 years of experience on projects of similar size and complexity.

1.5 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 DESCRIPTION

A. Signage as required by code and to facilitate wayfinding.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Tactile and Braille Characters: Text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Produce precisely formed characters with square-cut edges free from burrs and cut marks. Text shall be accompanied by Grade 2 Braille. Braille dots with domed or rounded shape produced using Raster Method.

1. Raised-Copy Thickness: Not less than 0.7 mm and not more than 3 mm.
2.3 MATERIALS

A. Aluminum Sheet and Plate: ASTM B 209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with at least the strength and durability properties of Alloy 5005-H32.

B. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.4 FINISHES

A. Painted Finishes: Specification is based on products listed by Matthews Paint.

1. Comparable products by one of the following are also acceptable. See Section 01 60 00 - Product Requirements for submittal requirements.
   a. Akzo Nobel.

2. Substitutions for products by manufacturers other than those listed above: See Section 016000 - Product Requirements.

3. Aluminum:
   a. Primer: 274 Series Epoxy Primer, color as required for topcoat color indicated, 1.5 - 2.0 mils DFT.
   b. Topcoat: VOC MAP, 2.0 mils DFT minimum, satin sheet unless indicated otherwise.

4. Acrylic, Polycarbonate:
   a. Primer: 74 777SP Tie Bond 0.4 - 0.6 mils DFT.
   b. Topcoat: VOC MAP, 2.0 mils DFT minimum, satin sheet unless indicated otherwise.

2.5 FABRICATION

A. Dimensional character signs:

1. Fabricated Channel Characters: Form exposed faces and sides of characters to produce surfaces free from warp and distortion. Include internal bracing for stability and attachment of mounting accessories.

2. Provide manufacturer's hardware for projection mounting of channel characters at distance from wall surface indicated.

3. Signage material, color and finish as Scheduled.

B. Panel Signs:

1. Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch measured diagonally from corner to corner signs.

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2. Edge Condition: Square.
3. Corner Condition: Square.
4. Mounting: Unframed, as indicated.
   a. Wall or Projection mounted with concealed attachment.
   b. Manufacturer's standard anchors for substrates encountered.
5. Tactile Characters: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.

2.6 ACCESSORIES
A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
B. Manufacturer's optional accessories required by the project:
   1. Anchors and Inserts: Provide nonferrous-metal or hot-dip galvanized anchors and inserts for exterior installations and elsewhere as required for corrosion resistance. Use toothed steel or lead expansion-bolt devices for drilled-in-place anchors. Furnish inserts, as required, to be set into concrete or masonry work.
   2. Brackets: Fabricate brackets and fittings for bracket-mounted signs from extruded aluminum to suit panel sign construction and mounting conditions indicated. Factory paint brackets in color matching background color of panel sign.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION
A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION
A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 PROTECTION
A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

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3.5 SCHEDULE

A. Building Address Sign: Polycarbonate, dimensional letters.

B. Room and Door Identification Signs: in compliance with Local Code.

C. Emergency Evacuation Signs: Panel Signs with printed map slot, surface mounted, locations as indicated and in compliance with local code.

END OF SECTION
SECTION 10 21 13
TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES
A. Delegated design of floor mounted partitions.
B. Solid plastic compartments.
C. Solid plastic urinal screens.

1.2 RELATED REQUIREMENTS
A. 05 50 00 - Metal Fabrications: for concealed steel support members.
B. 10 28 00 - Toilet Accessories: for accessories mounted on compartments.

1.3 SUBMITTALS
A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.
B. Delegated-Design Submittal: For assemblies indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
C. Product Data: Provide data on panel construction, hardware, and accessories.
D. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of ceiling supports, door swings.
   1. Provide template layouts and installation instructions for anchorage devices built into other work
E. Sample:
   1. Submit two samples of partition panels in manufacturer’s standard size illustrating panel finish, color, and sheen.
   2. Submit one sample of full set of hardware illustrating operation and finish.
F. Manufacturer’s Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

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G. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 QUALITY ASSURANCE
   A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years of experience.
   B. Designer Qualifications: Company specializing in performing the design work of this section with minimum 2 years of experience licensed in the location of the project.

1.5 DELIVERY, STORAGE, AND HANDLING
   A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

1.6 WARRANTY
   A. Special Manufacturer's Warranty: Provide manufacturer's standard form in which the manufacturer agrees to repair or replace products or materials that fail: 15 year warranty against rust-out of stainless steel toilet partitions and a Lifetime Warranty for stainless steel hardware.

PART 2 - PRODUCTS

2.1 DESCRIPTION
   A. Doors, panels, screens, and pilasters assembled into complete compartment system, with cutouts and drilled holes to receive hardware as indicated; processed and fabricated in accordance with industry standards.

2.2 PERFORMANCE AND DESIGN CRITERIA

2.3 MATERIALS
   A. Solid Plastic Toilet Compartments:
      2. Substitutions for products by manufacturers other than those listed above: See Section 01 60 00 – Substitution Request Form.
      3. Performance Criteria:

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a. Partition Configurations: Floor mounted overhead braced, Series 400.
b. Urinal Screen Configurations: Government-Flanged Model No. 3 with continuous chrome-plated brackets in addition to wing brackets.
c. Plastic Panels: High density polyethylene (HDPE) suitable for exposed applications, waterproof, non-absorbent, and graffiti-resistant textured surface
d. Stainless Steel Casings: ASTM A 743/A 743M.
e. Zinc Aluminum Magnesium and Copper Alloy (Zamac): ASTM B 86.
f. Aluminum: ASTM B 221/B 221M.
g. All corners welded for strength, rigidity.
h. Door and Panel Thickness: 1 inch.
i. Pilaster Thickness: 1-1/4 inch.
j. Shoes: 1 piece, 4" high, #4 stain brushed stainless steel finish

4. Features:
   a. All fasteners and reinforcing concealed from view from outside compartment.
   b. Pedestal fastened to floor with concealed anchors.
   c. Hardware, Heavy Duty: Manufacturer's heavy-duty stainless steel castings, including stainless steel tamper-resistant fasteners:
      1) Including: Brackets, hinges, latch and keeper, coat hook, and door pull:
         a) Hinges: Self-closing wrap-around gravity-type, adjustable to hold doors open at any angle up to 90 degrees, with emergency access by lifting door. Mount with stainless steel through-bolts.
         b) Latch and Keeper: Surface-mounted slide latch with wrap-around rubber-faced combination door strike and keeper, with provision for emergency access, meeting requirements for accessibility at accessible compartments.
         c) Coat hook: Combination hook and rubber-tipped stop, sized to prevent door from hitting compartment-mounted accessories. Provide wall bumper where door abuts wall. Provide formed L-shaped hook without stop at outswing doors. Mount with stainless steel through-bolts.
         d) Door Pull: Standard unit on outside of inswing doors. Provide pulls on both sides of outswing doors.
      2) Accessible Compartments: Provide self-closing hinges and door pulls complying with ADA 404.2.7 on both sides of the door near the latch.
      3) Material: Manufacturer's standard stainless steel.
   d. Finish: Charcoal Gray S215

2.4 ACCESSORIES
A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
PART 3 - EXECUTION

3.1 EXAMINATION
   A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION
   A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION
   A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 ADJUSTING
   A. Adjust and lubricate hardware for proper operation. Set hinges on in-swing doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swing doors (and entrance swing doors) to return to fully closed position.

3.5 CLEANING
   A. Dispose of all waste material in accordance with 01 74 19 - Cleaning.

3.6 PROTECTION
   A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
SECTION 10 28 00

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Toilet Room Accessories.

B. Janitorial Room Accessories.

1.2 RELATED REQUIREMENTS

A. 10 21 13 – Toilet Compartments

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Sample: Submit 1 sample of each accessory, illustrating color and finish.

C. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

D. Maintenance Data: For users operation and maintenance of system including:
   1. Methods for maintaining system's materials and finishes.
   2. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.4 MAINTENANCE MATERIAL

A. Keys: Provide 3 keys for accessories to Owner; master key all lockable accessories.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in performing the work of this section with minimum 5 years’ experience.
1.6 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Specification is based on products listed.

1. Comparable products by one of the following are also acceptable.

2. Substitutions for products by manufacturers other than those listed above: See Section 01 61 00 – Substitution Request Form.

2.2 DESCRIPTION

A. Accessories to be installed in toilet and janitorial rooms as noted on the Drawings.

2.3 PERFORMANCE AND DESIGN CRITERIA

A. Comply with ANSI/ICC A117.1, Americans with Disabilities Act (ADA).

B. Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

2.4 MATERIALS

A. Stainless Steel Sheet: ASTM A666, Type 304.

B. Stainless Steel Tubing: ASTM A269, Type 304 or 316.

C. Back paint, in accordance with 09 90 00 - Painting and Coating, where contact is made with building finishes to prevent electrolysis.

D. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.

E. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.
2.5 ACCESSORIES

A. Toilet Room Accessories:

1. Diaper Changing Station:
   a. Product: Koala Kare KB110-SSRE.
   b. Mounting: Recess-mounted folding diaper changing station, meeting or exceeding ASTM F2285.
   c. Material: Stainless steel, No. 4 finish.
   d. Orientation: Horizontal.

2. Grab Bars:
   a. Product: Bobrick Series B-5806 (horizontal) and B-5837 (two-wall ADA assist), sizes and configurations as indicated.
   b. Mounting: Flanges with concealed fasteners.
   c. Material: Stainless Steel, 18 gage, Type 304, satin.
   d. Outside Diameter: 1-1/4 inches, uniform around curves.

3. Lavatory Guards
   b. Antimicrobial (ASTM G21 and G22 0 growth) molded closed cell vinyl covers; 1/8" nominal wall thickness; 70-80 Shore A, Finish: smooth, high gloss, UV resistant, paintable.

4. Seat Cover Dispenser:
   a. Product: Bobrick B-221.
   b. Mounting: Surface.
   c. Capacity: 250 seat covers.
   d. Exposed Finish: Stainless steel, No. 4 finish.
   e. Lockset: Tumbler type.

5. Sanitary-Napkin Disposal Unit:
   b. Mounting: Surface mounted.
   c. Material and Finish: Stainless steel, No. 4 finish, satin.

6. Toilet Tissue Dispenser:
   a. Product: Summit Supply, TP-2
   b. Mounting: Surface mounted.
   c. Capacity: Two roll toilet paper dispenser.
   d. Color: Stainless Steel

7. Warm-Air Hand Dryer:

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b. Mounting: Cover mounted to wall with tamperproof bolts.
c. Cover Finish: Brushed stainless steel.
d. Voltage: 208-277 volt, 1.5-1.9 amp, 50/60 hz.
e. ADA compliant accessories.
f. Speed control accessory.

8. Soap Dispenser:
   b. Mounting: Counter-mounted.
   c. Capacity: 34-fl oz.
   d. Materials and Finish: Type 304 Stainless steel, satin finish.

9. Waste Receptacle:
   c. Capacity: 12.5-gal.
   d. Material and Finish: Type 304 Stainless steel, satin finish.
   e. Mount with bottom of receptacle 8" above floor.

10. Mirrors:
    a. Product: Bobrick B-1658 2436 Tempered glass with channel frame.
    b. Mounting: Secured to concealed wall hanger with concealed Phillips-head locking screws locating in bottom of frame.
    c. Glazing: Tempered per manufacturer.
    d. Materials and Finish: Type 340 Stainless Steel, Polish finish.

B. Janitorial Room Accessories.

1. Mop and Broom Holder with Shelf:
   a. Product: Bobrick B-239.
   b. Length: 34 inches.
   c. Holders: Three spring loaded, rubber hat, cam type.
   d. Material and Finish: Stainless steel, No. 4 finish.

2.6 ACCESSORIES

A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
3.1 EXAMINATION
   A. Verify existing conditions meet the manufacturer’s requirements before starting work.

3.2 PREPARATION
   A. Prepare surfaces to receive work in accordance with manufacturer’s instructions.

3.3 INSTALLATION
   A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.
   B. Install plumb and level, securely and rigidly anchored to substrate.
   C. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

3.4 TOLERANCES
   A. Maximum Variation From True Position: 1/8 inch.
   B. Maximum Variation From Plumb: 1/8 inch.

3.5 ADJUSTING
   A. Adjust and lubricate hardware for proper operation.

3.6 PROTECTION
   A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

END OF SECTION
PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fire extinguishers.

1.2 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Product Data: Provide extinguisher operational features, color and finish, and anchorage details.

C. Shop Drawings: Indicate location of each fire extinguisher to be installed.

D. Manufacturer's Installation Instructions: Indicate special preparation of substrate, installation and attachment methods, and perimeter conditions requiring special attention.

E. Maintenance Data: For users operation and maintenance of system including:
   1. Test, refill or recharge schedules and re-certification requirements.
   2. Methods for maintaining system's materials and finishes.
   3. Precautions about cleaning materials and methods that could be detrimental to components, finishes, and performance.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualification: Company specializing in the manufacture of work specified in this section with minimum 5 years experience.

1.4 DELIVERY, STORAGE, AND HANDLING

A. As required by the manufacturer for a warrantable installation of the installed products to meet the Performance and Design Criteria.

PART 2 - PRODUCTS
2.1 DESCRIPTION

A. Fire extinguishers, surface mounted with accessories for proper use.

1. 10lb extinguishers surface mounted at walls as indicated on the Drawings, with wall bracket as manufactured by Larsen’s Manufacturing or comparable products by Ansul, Inc. or JL Industries, Inc.

2.2 PERFORMANCE AND DESIGN CRITERIA

A. Portable fire extinguishers shall be selected and installed in accordance with this section and NFPA 10.

1. 2015 IBC.906.2, General Requirements.

2.3 MATERIALS

A. Fire Extinguishers:

1. Multi-Purpose Dry Chemical Extinguisher

   a. Specification is based on MP Series by Larsen’s Manufacturing Co.

   1) Comparable products by one of the following are also acceptable.


   2) Substitutions for products by manufacturers other than those listed above: See 01 61 00 – Substitution Request Form.

   b. Performance Criteria:

      1) Complying with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
      2) Labeled by UL for the purpose specified and indicated.
      3) Class: A:B:C.
      4) UL Rating: 4A-80B:C.
      5) Extinguisher Model: Larsen’s #MP5.
      6) Size: 10 pound.

   c. Features:

      1) Finish: Baked polyester powder coat.
      2) Color: Red.
      3) Wall mount
      4) Signage: Red vertical letters wall mounted above the canister that reads “FIRE EXTINGUISHER”, size of sign to be 4 inches by 12 inches.
2.4 ACCESSORIES
   A. All accessory materials required by the manufacturer for a warrantable installation of the installed products in a manner that meets the Performance and Design Criteria.
   B. Manufacturer's accessories required by the project:
      1. Extinguisher Wall Bracket: Formed steel, galvanized and enamel finished.

PART 3 - EXECUTION

3.1 EXAMINATION
   A. Verify existing conditions meet the manufacturer's requirements before starting work.

3.2 PREPARATION
   A. Prepare surfaces to receive work in accordance with manufacturer's instructions.

3.3 INSTALLATION
   A. General: Install all materials in accordance with manufacturer's instructions based on conditions present.

3.4 ADJUSTING
   A. Adjust and lubricate hardware for proper operation.

3.5 PROTECTION
   A. Protect installed work as required by the manufacturer to maintain product performance, design criteria and warranty.

3.6 SCHEDULE
   A. (FE): Typical: Wall Mounted; with Multi-Purpose Dry Chemical Extinguisher, Type: A:B:C, Capacity: 10 pound.

END OF SECTION
SECTION 10 51 13
METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes lockers.
   1. Double-tier steel lockers with baked enamel finish.

1.2 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.
   1. Show locker fillers, trim, base, and accessories. Include locker-numbering sequence.

C. Samples: For each exposed finish and for each color required.

D. Maintenance data.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Do not deliver metal lockers until spaces to receive them are clean, dry, and ready for their installation.

PART 2 - PRODUCTS

2.1 METAL LOCKERS

1. "Art Metal Products, Div. of Fort Knox Storage Co. Deerfield Beach, FL (800) 252-5633; (954) 429-9662 www.artmetalproducts.com

2. Lyon; Aurora, IL (800) 433-8488; (630) 892-8941 www.lyonworkspace.com

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3. Republic Storage Systems Company  
   Canton, OH  
   (800) 477-1255  
   www.republicstorage.com

B. Available Products: are specified for type, quality and construction required. Configured per Drawings. Provide 6-inch pedestals and metal kick plate.  
   1. Art Metal, “Standard KD Wardrobe Lockers”  
   2. Lyon, “Double Tier”  
   3. Republic Storage “Standard Locker”

C. Construction:  
   1. 16 gauge (minimum) steel louvered doors  
   2. 24 gauge (minimum) steel solid body components

D. Configuration: Double-tier.

E. Sizes: refer to Drawings for locations  
   1. 12-inches (w) x 12-inches (d) x 30-inches (h, not including pedestals)

F. Doors: to be louvered for ventilation.

G. Finish/Color: as selected by Architect from manufacturer’s standard colors.

H. Equipment: Equip each metal locker with the following  
   2. Coat rod.  
   3. Omit number identification plates (not required).

I. Accessories:  
   1. Base: 6 inch continuous Z-base 16 gauge. Angle fillers to be 16 gauge and at each end of locker runs to provide entire locker run be centered.  
   2. Recess Trim: Required  
   3. End Panels: Finished

J. Coordinate any outlet locations in metal base with Electrical.

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 366/A 366M, matte finish, suitable for exposed applications, and of stretcher-leveled flatness.

B. Expanded Metal: ASTM F 1267, Type II (flattened), 3/4-inch mesh, minimum 0.0747 inch thick, with at least 70 percent open area.
C. Fasteners: Zinc- or nickel-plated steel, slotless-type exposed bolt heads, and self-locking nuts or lock washers for nuts on moving parts.

D. Locker Fabrication: Knocked down.

2.3 DOOR LOCKS AND LATCHES

A. Doors shall have recessed stainless steel handle shaped to receive a padlock. The recess pan shall be deep enough to have the lock be flush with the outer door face.

B. The latching mechanism for doors shall be finger lift control type constructed of 14 gauge (minimum) steel with a nylon cover that has a generous finger pull.

C. Locking device shall be designed for use with padlocks. Latch hooks shall be securely welded to the vertical frame channel on the strike side to engage the nylon slide latches. Lockers shall be fabricated with three latch hooks for doors 48” and taller.

2.4 LOCKER ACCESSORIES

A. Interior Equipment: For each locker.

1. Hooks: Manufacturer's standard zinc-plated, ball-pointed steel. Provide one double-prong ceiling hook, and not fewer than two single-prong wall hooks for double-tier units. Attach hooks with at least two fasteners.

2. Coat Rods: Manufacturer's standard galvanized steel.

B. Continuous Metal Base: Minimum 0.0598-inch thick steel sheet, channel or zee profiled for stiffness, fabricated in lengths as long as practicable to enclose base and base ends of lockers, and finished to match lockers.

1. Height: 6 inches

2.5 LOCKER FABRICATION

A. Unit Principle: Fabricate each locker with an individual door and frame, individual top, bottom, back, and shelves, and common intermediate uprights separating compartments.

B. Knocked-Down Construction: Fabricate lockers for nominal assembly at Project site.

C. Fabricate lockers square, rigid, and without warp, with metal faces flat and free of dents or distortion. Make exposed metal edges free of sharp edges and burrs, and safe to touch. Weld frame members together to form a rigid, one-piece assembly.

1. Form locker-body panels, doors, shelves and accessories from one-piece steel sheet, unless otherwise indicated.
2.6 FINISHES

A. Factory finish all steel surfaces and accessories, except prefinished stainless-steel and chrome-plated surfaces.

B. Steel Baked-Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard baked-enamel finish consisting of a thermosetting topcoat. Comply with paint manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 1.4 mils on doors, frames, and legs, and 1.1 mils elsewhere.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Refer to manufacturer’s installation instructions. Install lockers and benches level, plumb, and true; shim as required, using concealed shims.

1. Anchor locker runs at ends and at intervals recommended by manufacturer, but not more than 36 inches o.c. Install anchors through backup reinforcing plates, channels, or blocking as required to prevent metal distortion, using concealed fasteners.
2. Anchor single rows of metal lockers to walls near top and bottom of lockers.

B. Metal Lockers: Assemble knocked-down metal lockers with standard fasteners, with no exposed fasteners on door faces or face frames.

C. Equipment and Accessories: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.

1. Attach hooks with at least two fasteners.
2. Attach door locks on doors using security-type fasteners.
3. Identification Plates: Identify metal lockers with identification indicated on Drawings.
   a. Attach plates to each locker door, near top, centered, with at least two aluminum rivets.
   b. Attach plates to upper shelf of each open-front metal locker, centered, with at least two aluminum rivets.

3.2 ADJUSTING, CLEANING, AND PROTECTION

A. Clean, lubricate, and adjust hardware. Adjust doors and latches to operate easily without binding. Verify that integral locking devices operate properly.
B. Protect metal lockers from damage, abuse, dust, dirt, stain, or paint. Do not permit metal locker use during construction.

C. Touch up marred finishes, or replace metal lockers that cannot be restored to factory-finished appearance. Use only materials and procedures recommended or furnished by metal locker manufacturer.

END OF SECTION
PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish all labor, materials and equipment required to install the play equipment and structures as indicated on the drawings or as approved and specified herein. The work shall include any incidentals required to provide a finished job.

1.2 REFERENCE SAFETY GUIDELINES AND STANDARDS

A. All materials and equipment shall conform to the current issue of the "Handbook for Public Playground Safety" published by the Consumer Product Safety Commission (C.P.S.C.) and ASTM F1487-Most Recent Edition. The manufacturer and installation contractor shall be responsible for correcting any product violations of the C.P.S.C. Guidelines and ASTM F1487-Most Recent Edition, to the satisfaction of the Engineer, should they be found after installation. 2010 ADA Standards for Accessible Design.

1.3 QUALITY ASSURANCE

A. The Contractor shall have at least 3 recent (within the last 3 years) installations of Play Equipment and shall, within 48 hours of the Engineer’s request, produce written proof of such. The Contractor must also be a Manufacturer Certified Installer and shall hold current National Playground Safety Institute Certification for Playground Safety Inspectors.

1.4 SUBMITTALS

A. The Contractor/Manufacturer’s Representative shall submit for approval prior to delivery scaled drawings of each specified component including dimensioned plans, color charts, erection drawings, installation details, parts list, and technical data for correct assembly of all components, clamp details, and anchoring details.

1.5 SUBSTITUTIONS

A. The Contractor/manufacturer shall submit requests for substitutions per Division 01 61 00 – Submittal Request Form and requirements.

1.6 WARRANTIES

A. The Contractor shall provide information on the equipment manufacturer’s guarantee. Contractor shall warranty installation workmanship of all play equipment for a period of two (2) years starting on the date of Physical Completion of the Project.
PART 2 - PRODUCTS

2.1 GENERAL:

A. Equivalent Products - Requests for substitution of specific play equipment products shall conform strictly to Section 01 61 00 - Substitution Request Form.

2.2 PLAY EQUIPMENT:

A. Compound Play Equipment shall be by Landscape Structures Inc. or approved equal as described below:

1. Product Number: 120711A
   Name: Pod Climber 16" DB
   Disc: Rotationally molded from U.V. stabilized linear low density polyethylene, disc measures 14" (356 mm) in diameter x 7" (178 mm) high, color specified.
   Support: Weldment comprised of 1.900" (48.26 mm) O.D. RS-20 (.090" - .100") (2.28 mm-2.54 mm) 1.315" (33.40 mm) O.D. RS-20 (.080" - 0.90") (2.03 mm-2.28 mm) and 3/16" x 5" (4.75 mm x 127 mm) diameter plate. Finish: ProShield, color specified.
   Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

2. Product Number: 219509A
   Name: GeoPlex Climber 56"Dk
   Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.
   Clamps: Cast aluminum. Finish: ProShield, color specified.
   Handhold Panel: Recycled Permalene, color specified.
   Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
   Climbing Wall: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.
   Locking Clamp: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified. Wall measures 37 (939 mm) wide x 34 (863 mm) High.

3. Product Number: 219509B
   Name: GeoPlex Climber 72"Dk
   Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.
   Clamps: Cast aluminum. Finish: ProShield, color specified.
   Handhold Panel: Recycled Permalene, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Climbing Wall: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.
Locking Clamp: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified. Wall measures 37 (939 mm) wide x 34 (863 mm) High.

4. Product Number: 116249A
Name: Vertical Ladder 32"Dk DB
Footer: Fabricated from 1.315" (33,40 mm) O.D. RS-20 (.080" - .090") (2,03 mm-2,28 mm) galvanized steel tubing. Finish: ProShield, color specified.
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Vertical Ladder: Weldment comprised of 1.125" ((28,58 mm) O.D. x 11 GA (.120") (3,04 mm) steel tubing, 1.029" (26,14 mm) O.D. RS-20 (.070" - .080") (1,78 mm-2,03 mm) and 3/16" x 2" (4,75 mm x 51 mm) wide steel flat plates. Finish: TenderTuff, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Handhold Panel: Permalene, color specified.

5. Product Number: 122916C
Name: Double Wave Climber 16"Dk Difference 56"Dk DB
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Climber: Weldment comprised of 1.660" (42,16 mm) O.D. RS-40 (.111" - .121") (2,82 mm-3,07 mm) galvanized steel tubing, 1.315" (33,40 mm) O.D. RS-20 (.080" - .090") (2,03 mm-2,28 mm) galvanized steel tubing and 1/4" (6,35 mm) HR flat steel. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Support: Formed from 1.660" (42,16 mm) O.D. RS-40 (.111" - .121") (2,82 mm-3,07 mm) galvanized steel tubing. Finish: ProShield, color specified.
Handhold Panel: Permalene, color specified.

6. Product Number: 145624A
Name: Vertical Ascent 48"Dk
Panels: Permalene, color specified.
Clamps: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Made from Polyester Resin. Handholds measure approx. 5 3/4" (146,05 mm) long x 2 1/4" (57,15 mm) wide x 1 3/4" (44,45 mm) high.

Made from Polyester Resin. Handholds measure approx. 5 3/4" (146,05 mm) long x 2 1/4" (57,15 mm) wide x 1 3/4" (44,45 mm) high.

9/30/19
7. **Product Number: 152907B**  
Name: Deck Link w/Barriers Steel end panels 2 Steps  
Step Section: Formed from 12 GA (.105") (2.66 mm) sheet steel conforming to ASTM A1011. Standing surface is 24 1/4" (615.95 mm) wide x 14" (356 mm) deep and is perforated with 5/16" (7.94 mm) diameter holes. Finish: TenderTuff, color specified.  
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.  
Clamps: Cast aluminum. Finish: ProShield, color specified.  
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).  
Barrier: Weldment comprised of 1.125" (28.58 mm) O.D. x 11 Ga. (.120") (3.04 mm) wall steel tubing, 5/8" (15.88 mm) O.D. steel bar with 203 or 303 stainless steel 3/8" (9.53 mm) threaded inserts. Finish: TenderTuff, color specified.  
SteelX Panels: Zinc plated 7 GA (.179") (4.55 mm) HRPO flat steel. Finish: ProShield, color specified.

8. **Product Number: 152907D**  
Name: Deck Link w/Barriers Steel end panels 4 Steps  
Step Section: Formed from 12 GA (.105") (2.66 mm) sheet steel conforming to ASTM A1011. Standing surface is 24 1/4" (615.95 mm) wide x 14" (356 mm) deep and is perforated with 5/16" (7.94 mm) diameter holes. Finish: TenderTuff, color specified.  
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.  
Clamps: Cast aluminum. Finish: ProShield, color specified.  
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).  
Barrier: Weldment comprised of 1.125" (28.58 mm) O.D. x 11 Ga. (.120") (3.04 mm) wall steel tubing, 5/8" (15.88 mm) O.D. steel bar with 203 or 303 stainless steel 3/8" (9.53 mm) threaded inserts. Finish: TenderTuff, color specified.  
SteelX Panels: Zinc plated 7 GA (.179") (4.55 mm) HRPO flat steel. Finish: ProShield, color specified.

9. **Product Number: 176078A**  
Name: Lollipop Climber 48"Dk DB  
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.  
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).  
Handhold Panel: Permalene, color specified.  
Lollipop Climber: Weldment comprised of 1.315" (33.40 mm) O.D. RS20 (.080"-.090") (2.03 mm-2.28 mm) wall galvanized steel tube, 2.375" (60.33 mm) O.D. RS20 (.095"-.105") (2.41 mm-2.66 mm) wall galvanized steel tube, 1/4" (6.35 mm) HRPO steel sheet and 10 GA. (.135") (3.43 mm) HRPO steel. Finish: ProShield, color specified.  
Clamps: Cast aluminum. Finish: ProShield, color specified.

10. **Product Number: 111228A**
Name: Square Tenderdeck
Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Square Deck: Flange formed from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size measures 2 5/8" x 47" x 47" (66,68 mm x 1194 mm x 1194 mm). Finish: TenderTuff, color specified.

11. Product Number: 111231A
Name: Triangular Tenderdeck
Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Triangular Deck: Flange formed from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size measures 2 5/8" x 37 3/4" (66,68 mm x 958,85 mm). Finish: TenderTuff, color specified.

12. Product Number: 121948A
Name: Kick Plate 8"Rise
Kick Plate: Fabricated from 11 GA (.120") (3,04 mm) HR flat steel. Finish: TenderTuff, brown or gray in color.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

13. Product Number: 152911A
Name: Curved Transfer Module Left 32"Dk DB
Clamps: Cast aluminum. Finish: ProShield, color specified.
Panels: Permalene, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Railings: Weldment comprised of 1.125" (28,58 mm) O.D. x 11 GA (.120") (3,04 mm) steel tubing with 203 or 303 stainless steel 3/8" (9,53 mm) threaded inserts. Finish: TenderTuff, color specified.
Step Support: Weldment comprised of 1.660" (42,16 mm) O.D. RS-20 (.080" - .095") (2,03 mm-2,41 mm) galvanized steel tubing and 1 3/4" x 1 3/4" x 1/8" (44,45 mm x 44,45 mm x 3,17 mm) HR angle. Finish: ProShield, color specified.
Step Sections/Top Step Section: Formed from 12 GA (.105") (2,66 mm) HRPO sheet steel conforming to ASTM A1011. Standing surface is 24 3/8" (619,13 mm) wide x 14" (355,6 mm) deep and is perforated with 5/16" (7,92 mm) diameter holes. Finish: TenderTuff, color specified.
Deck Support: Weldment comprised of 3 1/2" (88.9 mm) O.D. RS-20 (.125") (3,17 mm) galvanized steel tubing and 3/8" (9,53 mm) O.D. x 5" (127 mm) long CRS rod. Finish: ProShield, color specified.

Deck: Flange formed from 12 GA (.105") (2,66 mm) HRPO sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes and measures 29" (737 mm) per (2) sides. Finish: TenderTuff, color specified.

14. Product Number: 152911C
Name: Curved Transfer Module Right 48"Dk DB
Clamps: Cast aluminum. Finish: ProShield, color specified.
Panels: Permalene, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Railings: Weldment comprised of 1.125" (28,58 mm) O.D. x 11 GA. (.120") (3,04 mm) steel tubing with 203 or 303 stainless steel 3/8" (9,53 mm) threaded inserts. Finish: TenderTuff, color specified.
Step Support: Weldment comprised of 1.660" (42,16 mm) O.D. RS-20 (.080" - .095") (2,03 mm-2,41 mm) galvanized steel tubing and 1 3/4" x 1 3/4" x 1/8" (44,45 mm x 44,45 mm x 3,17 mm) HR angle. Finish: ProShield, color specified.
Step Sections/Top Step Section: Formed from 12 GA (.105") (2,66 mm) HRPO sheet steel conforming to ASTM A1011. Standing surface is 24 3/8" (619,13 mm) wide x 14" (355,6 mm) deep and is perforated with 5/16" (7,92 mm) diameter holes. Finish: TenderTuff, color specified.
Deck Support: Weldment comprised of 3 1/2" (88,9 mm) O.D. RS-20 (.125") (3,17 mm) galvanized steel tubing and 3/8" (9,53 mm) O.D. x 5" (127 mm) long CRS rod. Finish: ProShield, color specified.
Deck: Flange formed from 12 GA (.105") (2,66 mm) HRPO sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes and measures 29" (737 mm) per (2) sides. Finish: TenderTuff, color specified.

15. Product Number: 111240A
Balcony Deck
Deck: Fabricated from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,93 mm) diameter holes perforated. The finished size measures 2 5/8" x 34" (66,67 mm x 863 mm) (straight edge) x 17" (431 mm) radius (curved edge). Finish: TenderTuff, color specified.
Barrier: Weldment comprised of 5/8" (15,87 mm) solid steel vertical rails, 1 1/8" (28,57 mm) O.D. steel horizontal rails with 203 or 303 stainless steel welded inserts with 5/8" (15,87 mm) internal threads. Finish: TenderTuff, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

16. Product Number: 115227A
Name: Zoo Panel Above Deck
Panels: Permalene, color specified.
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Angled Panel Bracket: Weldment comprised of .190" (4.83 mm) thick 5052 aluminum formed angle with (2) 6005-T5 aluminum threaded tubes 1 1/8" (28.58 mm) O.D. x 1 1/2" (38.1 mm) long. Finish: ProShield, color specified.

17. Product Number: 115254A
Name: Storefront Panel
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Store Panel: One-color Permalene. Panel measures 35 1/2" (901.7 mm) wide x 37" (940 mm) high, color specified.
Bracket: Formed 11 GA (.120") (3.04 mm) 5052 aluminum angle. Finish: ProShield, color matched to panel.

18. Product Number: 116244B
Name: Pipe Barrier w/Wheel Above Deck
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
90o Bracket: Formed from 1/4" x 1 1/4" (6.35 mm x 31.75 mm) HRPO flat steel. Finish: ProShield, color specified.
Wheel Clamp: Formed from 3/16" x 2" (4.75 mm x 52 mm) HRPO zinc-plated. Finish: ProShield, color specified.
Pipe Barrier: Weldment comprised of 5/8" (15.88 mm) solid steel vertical rails, 1 1/8" (28.58 mm) O.D. x 1 11/16 GA (.120") (3.04 mm) steel horizontal rails with 203 or 303 stainless steel welded inserts with 5/8" (15.88 mm) internal threads, 1 1/2" x 1 1/2" x 29 1/2" (38.1 mm x 38.1 mm x 749.3 mm) angle iron. Barrier measures 33 7/8" (860.43 mm) wide x 39 13/16" (1011.22 mm) high. Finish: TenderTuff, color specified.
Wheel: 12" (305 mm) diameter cast A319.1 aluminum alloy. Shaft-303 stainless steel. Finish: TenderTuff, color specified.

19. Product Number: 116244A
Name: Pipe Barrier Above Deck
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
90o Bracket: Formed from 1/4" x 1 1/4" (6.35 mm x 31.75 mm) HRPO flat steel. Finish: ProShield, color specified.
Pipe Barrier: Weldment comprised of 5/8" (15.88 mm) solid steel vertical rails, 1 1/8" (28.58 mm) O.D. x 11 GA (.120") (3.04 mm) steel horizontal rails with 203 or 303 stainless steel welded inserts with 5/8" (15.88 mm) internal threads, 1 1/2" x 1 1/2" x 29
20. Product Number: 117957A
Name: Periscope Panel Above Deck
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Permalene Panel: Two color panel measures 35 5/8" (904,88 mm) wide x 41" (1041 mm) high, color specified.
Mounting Plate: Fabricated from formed 11 GA (.120") (3,04 mm) HRS. Finish: ProShield, red in color.
Angled Panel Bracket: Weldment comprised of .190" (4,83 mm) thick 5052 aluminum formed angle with (2) 6005-T5 aluminum threaded tubes 1 1/8" (28,58 mm) O.D. x 1 1/2" (38,1 mm) long. Finish: ProShield, color specified.
Periscope Assembly: Fabricated from an octagon 14 GA (.075") (1,91 mm) steel tube ProShield red with (2) 18 GA (.048") (1,22 mm) 304 stainless steel bright annealed (reflective finishes). Periscope rotates vertically and horizontally. Permalene: Hand-grip and lense covers are black in color.

21. Product Number: 119514A
Name: Pilot Panel Above Deck
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Permalene Panel: Two color panel measures 35 5/8" (904,88 mm) wide x 41" (1041 mm) high, color specified.
Angled Panel Bracket: Weldment comprised of .190" (4,83 mm) thick 5052 aluminum formed angle with (2) 6005-T5 aluminum threaded tubes 1 1/8" (28,58 mm) O.D. x 1 1/2" (38,1 mm) long. Finish: ProShield, color specified.
Wheel: 12" (305 mm) diameter cast A319.1 aluminum alloy. Shaft-303 stainless steel. Finish: TenderTuff, color specified.
Wheel Bracket: Weldment comprised of formed 3/16" (4,75 mm) plate and 5/8" (15,88 mm) O.D. stainless steel shaft. Finish: ProShield, Black in color.

22. Product Number: 164092A
Name: Bongo Panel Above Deck
Bongo: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.
Clamps: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Permalene Panel: Two color panel measures 35 5/8" (904,88 mm) wide x 41" (1041 mm) high, color specified.

Angled Panel Bracket: Weldment comprised of .190" (4,83 mm) thick 5052 aluminum formed angle with (2) 6005-T5 aluminum threaded tubes 1 1/8" (28,58 mm) O.D. x 1 1/2" (38,1 mm) long. Finish: ProShield, color specified.

Screen Plate: Fabricated from 12 GA. (.105") (2,66 mm) HRPO flat steel. Finish: Black in color.

23. Product Number: 177712A
Name: Color Splash Panel Above Deck
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.

Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.

Angled Panel Bracket: Weldment comprised of .190" (4,83 mm) thick 5052 aluminum formed angle with (2) 6005-T5 aluminum threaded tubes 1 1/8" (28,58 mm) O.D. x 1 1/2" (38,1 mm) long. Finish: ProShield, color specified.

Panel: Permalene panel measures 35 5/8" (904,87 mm) wide x 41" (1041 mm), color specified.

Color Splash Panel Assy.: Assembly comprised of (Permalene Panels), color specified.

(Permalene Panel) 1/4" (6,35 mm) thick x 26 3/4" (679,45 mm) diameter. (Acrylic Panel) 1/8" (3,18 mm) thick x 26 3/4" (679,45 mm) diameter clear. (Color Wheel) .1875" (4,76 mm) thick x 23 7/16" (595,30 mm) diameter aluminum sheet. Finish: ProShield, image is transferred into paint by the process of infusion. (Shaft) 300 Series stainless steel. (Thrust Oilite Bearing) .125" (3,18 mm) thick x 2.875" (73,03 mm) diameter. (Sleeve Oilite Bearing) 1.25" (31,75 mm) diameter x .750" (19,05 mm) long.

24. Product Number: 185296A
Name: 10' PlayOdyssey Tower
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Clamps: Cast aluminum. Finish: ProShield, color specified.

Poly Roof: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

Infill Panel: Recycled Permalene, color specified.

Support Bar: Fabricated from 1/4" x 1 1/4" (6,35 mm x 31,75 mm) HRPO flat steel. Finish: ProShield, color specified.

Double Post: Weldment comprised of 5" (127 mm) O.D. x 11 GA (.120") (3,04 mm) galvanized steel tubing, 1.029" (26,13 mm) O.D. RS-20 (.070" - .080") (4,51 mm-2,03 mm) galvanized steel tubing, 1.315" (33,40 mm) O.D. RS-20 (.080" - .090") (2,03 mm-2,28 mm) galvanized steel tubing and 1/4" x 1 1/4" (6,35 mm x 31,75 mm) HRPO flat steel. Finish: ProShield, color specified.

Infill Deck: Flange formed from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes. The finished
size measures 2 5/8" x 24 3/8" x 24 3/8" (66,68 mm x 619,13 mm x 619,13 mm). Finish: TenderTuff, color specified.
Octagon Deck: Flange formed from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes. Deck face has (4) slotted holes for face mounting components. The combined finished size measures 2 5/8" x 106 1/4" x 106 1/4" (66,68 mm x 2698,75 mm x 2698,75 mm). Finish: TenderTuff, color specified.
Roof Post: Weldment comprised of 4.675" (118,75 mm) O.D. x .150" (3,81 mm) 6061-T6 extruded aluminum and formed 5" (127 mm) O.D. x .125" (3,17 mm) 6005-T5 extruded aluminum. Finish: ProShield, color specified.
Nylon Spacer: 3/8" (9,53 mm) I.D. nylon washer.
Inner Deck Plate: Fabricated from 1/4" (6,35 mm) HRPO steel sheet. Finish: ProShield, color specified.
Pipebolt: Fabricated from 1.125" (28,58 mm) O.D. 6061-T6 aluminum tube, with 3/8" (9,53 mm) internal threads.
Outer Post: Fabricated from 5" O.D. x 11 GA (.120") galvanized steel tubing and die cast 369.1 aluminum post cap. Finish: ProShield, color specified.
Re-bar #5: 5/8" Diameter.

25. Product Number: 222709A
Name: 10' Tower WhooshWinder Slide
Clamps: Cast aluminum. Finish: ProShield, color specified.
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Exit Footer: Weldment comprised of 2.375" (60,33 mm) O.D. RS-20 (.095" -.105") (2,41 mm - 2,66 mm) galvanized steel tubing and 1/4" x 3" x 7 1/2" (6,35 mm x 76 mm x 191 mm) HRPO steel mounting plate. Finish: ProShield, color specified.
Mid-Support: Weldment comprised of 1.900" (48,26 mm) O.D. RS20 (.090" -.100") (2,28 mm - 2,54 mm) galvanized steel tubing and 7 GA. (.179") (4,54 mm) HRPO steel strap. Finish: ProShield, color specified.
Rail: 1 1/8" (28,58 mm) O.D. 6061-T6 aluminum extrusion with 5/16" (7,92 mm) walls. Finish: ProShield, color specified.
Slide Sections: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.
Rail Spacer: Fabricated from 1.312" (33,32 mm) O.D. x 16 Ga. (.065") (1,65 mm) steel tubing. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Lower Support: Weldment comprised of 1.900" (48,26 mm) O.D. RS20 (.090"-.100") (2,28 mm - 2,54 mm) galvanized steel tubing and 1/4" (6,35 mm) flat steel. Finish: ProShield, color specified.
10' Support: Weldment comprised of 1.900" (48,26 mm) O.D. RS20 (.090"-.100") (2,28 mm - 2,54 mm) galvanized steel tubing. Finish: ProShield, color specified.

26. Product Number: 111357A
Name: Chinning Bar Alum DB
Post: See PlayBooster (PB) General Specifications.
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Rail: Weldment comprised of 1.125" (28.58 mm) O.D. x 11 GA (.120") (3.04 mm) steel tubing with 203 or 303 stainless steel 5/8" (15,88 mm) threaded inserts. Finish: TenderTuff, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
30. Product Number: 182503C  
Name: Welcome Sign (LSI Provided) Ages 5-12 years Direct Bury  
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).  
Post: Weldment comprised 2.375" (60,33 mm) O.D. RS20 (.095-.105) (2,41 mm-2,67 mm) wall galvanized tube, 1/4" (6,35 mm) HRPO steel sheet and aluminum post cap. Finish: ProShield, color specified.  
Sign Panel: Panel is fabricated from 1/8" (.125") (3,17 mm) aluminum plate. Finish: ProShield, gray in color. (Sign) Digital image is transferred to a 1/8" (.125") (3,17 mm) ProShield coated aluminum plate, then infused into the ProShield.

31. Product Number: 130390A  
Double Swoosh Slide 72"Dk DB  
Rail: Extruded from 1.125" ((28,58 mm) O.D. x .312" (7,92 mm) wall. 6005-T5 aluminum. Finish: ProShield, color specified.  
Slide Support: Weldment comprised of 2.375" (60,33 mm) O.D. RS-20 (.095" - .105") (2,41 mm-2,66 mm) galvanized steel tubing and 1/4" x 3" (6,35 mm x 76 mm) mounting plate. Finish: ProShield, color specified.  
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.  
Slide: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.  
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).  
Rail Spacer: Fabricated from 1.312" (33,32 mm) O.D. x 16 GA (.065") (1,65 mm) steel tubing. Finish: ProShield, color specified.  
Slide Hood: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.

32. Product Number: 148426A  
Firepole Perm Handholds 48"Dk DB  
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.  
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22,23 mm) O.D. x 1 11/16" (42,85 mm). Finish: ProShield, color specified.  
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).  
Firepole: Weldment comprised of 1.900" (48,26 mm) O.D. RS-20 (.090"-.100") (2,28 mm-2,54 mm) galvanized steel tubing, and 1.315" (33,40 mm) O.D. RS-20 (.080"-.090") (2,03 mm-2,28 mm) galvanized steel tubing. Finish: ProShield, color specified.  
Handhold Panel: Recycled Permalene, color specified.

33. Product Number: 100041A  
Name: Curved Balance Beam DB  
Balance Beam: Weldment comprised of 1 1/2" (38,1 mm) x 3" (76 mm) x 11 GA (.120") (3,04 mm) rectangular steel tubing. Finish: TenderTuff, color specified.
Support Leg: Weldment comprised of 2 3/8" (60,33 mm) O.D. RS20 (.095"-.105") (2,41 mm-2,66 mm) galvanized steel tubing and 3/8" x 4" (60,33 mm x 102 mm) mounting plate. Finish: ProShield, color specified.

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

34. Product Number: 174018A
   Name: Belt Seat ProGuard Chains for 8' Beam Height
   Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
   Belt Seat: Molded from UV stabilized black EPDM rubber encapsulating a weldment comprised of a 22 GA (.029") (0,74 mm) spring stainless steel sheet and (4) .105" (2,67 mm) thick stainless steel washers. The belt seat elliptical shape measures 7" (178 mm) wide x 26" (660 mm) long x .700" (17,78 mm) thick.
   Bolt Link: Stainless Steel
   Chain/ProGuard: Steel 3/16" (4,75 mm) straight link chain, 800 lb. (362,87 kilograms) working load limit. Finish: ProGuard.

35. Product Number: 177344A
   Name: Single Post Swing Frame 52" Bury 8' Beam Height Only
   Half Clamp: Cast aluminum. Finish: ProShield, color specified.
   Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
   Beam: Weldment comprised of 2.375" (60,33 mm) O.D. RS-40 (.130" - .140") (3,30 mm-3,56 mm) galvanized steel tubing, 3" (76 mm) wide zinc-plated steel clamps and 1 1/4" (31,75 mm) housings w/bronze bushings. Finish: ProShield, color specified.
   Post: See PlayBooster (PB) General Specifications.

36. Product Number: 177345A
   Single Post Swing Frame 52" Bury Additional Bay 8' Beam Height Only
   Half Clamp: Cast aluminum. Finish: ProShield, color specified.
   Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
   Beam: Weldment comprised of 2.375" (60,33 mm) O.D. RS-40 (.130" - .140") (3,30 mm-3,56 mm) galvanized steel tubing, 3" (76 mm) wide zinc-plated steel clamps and 1 1/4" (31,75 mm) housings w/bronze bushings. Finish: ProShield, color specified.
   Post: See PlayBooster (PB) General Specifications.

37. Product Number: 177351A
   Name: Molded Bucket Seat (5-12 yrs) w/Harness ProGuard Chains for 8' Beam Height
   Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
   Dbl. Pivot Block: Fabricated from 6061-T6 Aluminum with bronze oil impregnated bearing.
Bumper: Molded from U.V. stabilized black EPDM rubber encapsulating 11 GA (.120") (3.04 mm) HRPO steel sheet.
Mounting Bracket: Cast from 535 aluminum magnesium.
Chain/ProGuard: Steel 3/16" (4.75 mm) straight link chain, 800 lb. (362.87 kilograms) working load limit. Finish: ProGuard.

38. Product Number: 237297A
Name: Friendship Swing w/Single Post Frame Additional Bay 52" Bury ProGuard Chains
Clamps: Cast aluminum. Finish: ProShield, color specified.
Swing Beam: Weldment comprised of tee clamps and 5" (127 mm) O.D. extruded 6005-T5 aluminum alloy tube with a .125" (3.17 mm) W. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

39. Product Number: 148432A
Name: Corkscrew Perm Handholds 40"Dk DB
Corkscrew: Weldment comprised of 1.900" (48.26 mm) O.D. RS-20 (.090"-.100") (2.28 mm-2.54 mm) galvanized steel tubing, and 1.315" (33.40 mm) O.D. RS-20 (.080"-.090") (2.03 mm-2.28 mm) galvanized steel tubing. Finish: ProShield, color specified.
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Handhold Panel: Recycled Permalene, color specified.

40. Product Number: 157427D
Pod Climer w/Handloop & Handrail 40"Dk DB Right Handhold
Clamps: Cast aluminum. Finish: ProShield, color specified.
Panels: One-color Permalene seat, wing, and top panel yellow in color and tires black in color. Two color Permalene body panel, steering wheel and propeller yellow/blue in color and propeller tan/blue in color.
Spacer Tube: Made from 6061-T6 aluminum 7/8" (22.23 mm) O.D. x 1 11/16" (42.85 mm). Finish: ProShield, color specified.
Disc: Rotationally molded from U.V. stabilized linear low density polyethylene, disc measures 14" (356 mm) in diameter x 7" (178 mm) high, color specified.
Handhold Panel: Permalene, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Handloop: Weldment comprised of 1.125" (28.58 mm) O.D. x 11 GA (.120") (3.04 mm) steel tubing with 203 or 303 stainless steel inserts, with 3/8" (9.53 mm) internal thread. Finish: TenderTuff, color specified.

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Handrail: Weldment comprised of 1.125” (28,58 mm) O.D. x 11 GA (.120") (3,04 mm) steel tubing with 203 or 303 stainless steel welded inserts with 3/8” (9,53 mm) internal threads. Finish: TenderTuff, color specified.
Support: Weldment comprised of 1.900" (48,26 mm) O.D. RS-20 (.090" - .100") (2,28 mm-2,54 mm), 1.315" (33,40 mm) O.D. RS-20 (.080" - .090") (2,03 mm-2,28 mm) and 3/16” x 5” (4,75 mm x 127 mm) diameter plate. Finish: ProShield, color specified.

41. Product Number: 111228A
Name: Square Tenderdeck
Deck Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Square Deck: Flange formed from 12 GA (.105") (2,66 mm) sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16” (7,92 mm) diameter holes. Deck face has (4) slotted holes for face mounting components. The finished size measures 2 5/8” x 47” x 47” (66,68 mm x 1194 mm x 1194 mm). Finish: TenderTuff, color specified.

42. Product Number: 184354B
Name: Curved Transfer Module Left 2-5yrs 40"Dk DB
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Panels: Permalene, color specified.
Clamps: Cast aluminum. Finish: ProShield, color specified.
Step Support: Weldment comprised of 1.660" (42,16 mm) O.D. RS-20 (.080" - .095") (2,03 mm-2,41 mm) galvanized steel tubing and 1 3/4" x 1 3/4" x 1/8" (44,45 mm x 44,45 mm x 3,17 mm) HR angle. Finish: ProShield, color specified.
Step Sections/Top Step Section: Formed from 12 GA (.105") (2,66 mm) HRPO sheet steel conforming to ASTM A1011. Standing surface is 24 3/8" (619,13 mm) wide x 14" (355,6 mm) deep and is perforated with 5/16” (7,92 mm) diameter holes. Finish: TenderTuff, color specified.
Deck Support: Weldment comprised of 3 1/2" (88,9 mm) O.D. RS-20 (.125") (3,17 mm) galvanized steel tubing and 3/8" (9,53 mm) O.D. x 5" (127 mm) long CRS rod. Finish: ProShield, color specified.
Deck: Flange formed from 12 GA (.105") (2,66 mm) HRPO sheet steel conforming to ASTM A1011. Standing surface is perforated with 5/16" (7,92 mm) diameter holes and measures 29" (737 mm) per (2) sides. Finish: TenderTuff, color specified.
Spacer Tube: Fabricated from 6061-T6 aluminum 1 1/8" (28,58 mm) O.D. x 1 1/4" (31,75 mm). Finish: ProShield, color specified.
Spacer Tube: Made from 1 1/8” O.D. 6061-T6 aluminum tubing. Finish: ProShield, color specified.
Railings: Weldment comprised of formed 1 1/8" O.D. x 11 GA (.120") steel tubing, 3/16” thick HR flat steel, 3/16” thick HRPO steel plate and 3/4” O.D. x 11 GA. (.120") stainless steel tubing. Finish: TenderTuff, color specified.

43. Product Number: 228215A
Name: Rhapsody Goblet Drum Junior DB
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Drum Leg: Made from 3.500" (88.9 mm) O.D. RS20 (.125") (3,17 mm) wall galvanized steel tubing. Finish: ProShield, color specified.

Drum Head: Translucent, UV stabilized polycarbonate with a matte textured surface on one side.

Trim: Permalene, color specified.

Top Assembly: Weldment comprised of 3.500" (88.9 mm) O.D. RS20 (.125") (3,17 mm) wall galvanized steel tubing, 11 GA. (.120") (3,05 mm) flat steel and ½" (3,17 mm) thick HRPO steel sheet. Finish: ProShield, color specified.

Screen: Made from 11 GA. (.125") (3,17 mm) thick aluminum sheet. Finish: ProShield, color specified.

44. Product Number: 228217A

Name: Rhapsody Kettle Drum Junior DB

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Drum Leg: Made from 3.500" (88.9 mm) O.D. RS20 (.125") (3,17 mm) wall galvanized steel tubing. Finish: ProShield, color specified.

Kettle Drum Assy.: Weldment comprised of 3.500" (88.9 mm) O.D. RS20 (.125") (3,17 mm) wall galvanized steel tubing and 11 GA. (.120") (3,05 mm) flat steel. Finish: ProShield, color specified.

Drum Head: Translucent, UV stabilized polycarbonate with a matte textured surface on one side.

Trim: Permalene, color specified.

45. Product Number: 228218A

Name: Rhapsody Kundu Drum Junior DB

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Drum Leg: Made from 3.500" (88.9 mm) O.D. RS20 (.125") (3,17 mm) wall galvanized steel tubing. Finish: ProShield, color specified.

Drum Head: Translucent, UV stabilized polycarbonate with a matte textured surface on one side.

Trim: Permalene, color specified.

Screen: Made from 11 GA. (.125") (3,17 mm) thick aluminum sheet. Finish: ProShield, color specified.

Top Assembly: Weldment comprised of 3.500" (88.9 mm) O.D. RS20 (.125") (3,17 mm) wall galvanized steel tubing, 11 GA. (.120") (3,05 mm) flat steel and ½" (3,17 mm) thick HRPO steel sheet. Finish: ProShield, color specified.

46. Product Number: 182503A

Name: Welcome Sign (LSI Provided) Ages 2-5 years Direct Bury

Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).

Border: Permalene, black in color.
Post: Weldment comprised 2.375" (60,33 mm) O.D. RS20 (.095-.105) (2,41 mm-2,67 mm) wall galvanized tube, 1/4" (6,35 mm) HRPO steel sheet and aluminum post cap. Finish: ProShield, color specified.
Sign Panel: Panel is fabricated from 1/8" (.125") (3,17 mm) aluminum plate. Finish: ProShield, gray in color. (Sign) Digital image is transfered to a 1/8" (.125") (3,17 mm) ProShield coated aluminum plate, then infused into the ProShield.

47. Product Number: 123333A
Name: Rollerslide 40"Dk DB
Offset Hanger Clamp Assembly: Cast aluminum. Finish: ProShield, color specified.
Rail: 1 1/8" (28,58 mm) O.D. 6061-T6 aluminum extrusion with 5/16" (7,92 mm) walls. Finish: ProShield, color specified.
Rollers: Fabricated from 1.900" (48,26 mm) O.D. x 16 GA (.060") (1,52 mm) galvanized steel tubing. Finish: TenderTuff, color specified.
Hood: Rotationally molded from U.V. stabilized linear low density polyethylene, color specified.
Rails: Extruded from 6005-T1 aluminum. Finish: ProShield, color specified.
Roller Shafts: Fabricated from 1/2" (305 mm) diameter CRS zinc-plated with yellow chromate finish.
Support Leg: Fabricated from 1.900" (48,26 mm) O.D. RS-20 (.090" - .100") (2,28 mm-2,54 mm) galvanized steel tubing. Finish: ProShield, color specified.
Top Plate: Formed from 10 GA (.135") (3,43 mm) 304-2B SST. Finish: TenderTuff, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Rail Spacer: Fabricated from 1.312" (33,32 mm) O.D. x 16 GA (.065") (1,65 mm) steel tubing. Finish: ProShield, color specified.
Tube: 1 1/8" O.D. x 1 5/8" long aluminum tube. Finish: ProShield, color specified.

48. Product Number: 176038A
Name: Full Bucket Seat ProGuard Chains for 8’ Beam Height
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Full Bucket Seat: Made of U.V. stabilized high-quality black rubber encapsulating a 24 GA (.024") (0,61 mm) stainless steel reinforcement plate. Handles cast from 356-T6 aluminum alloy with black polyarmor paint finish. Handles attach to seat with (3) 1/4" (6,35 mm) x 1 5/16" (33,32 mm) long stainless steel rivets. The full bucket measures 9" (229 mm) deep x 10 1/2" (266,7 mm) wide.
Chain/ProGuard: Steel 3/16" (4,75 mm) straight link chain, 800 lb. (362,87 kilograms) working load limit. Finish: ProGuard.

49. Product Number: 177345A
Name: Single Post Swing Frame 52” Bury Additional Bay 8’ Beam Height Only
Half Clamp: Cast aluminum. Finish: ProShield, color specified.
Fasteners: Primary fasteners shall be socketed and pinned tamperproof in design, stainless steel (SST) per ASTM F 879 unless otherwise indicated (see specific product installation/specifications).
Beam: Weldment comprised of 2.375" (60.33 mm) O.D. RS-40 (.130" - .140") (3,30 mm-3,56 mm) galvanized steel tubing, 3" (76 mm) wide zinc-plated steel clamps and 1 1/4" (31,75 mm) housings w/bronze bushings. Finish: ProShield, color specified.
Post: See PlayBooster (PB) General Specifications.

B. Color specification will be recommended by the manufacturer and approved by the Engineer upon product submittal.

2.3 FINISHES:

A. Polyester (Powder) Coating - The polyester coating shall be uniformly applied by the electrostatic method to a thickness of three to five mils. Promptly after application of the powder, the coating shall be oven-cured at 400 degrees Fahrenheit. The color(s) of the polyester coating shall be as selected by the Engineer from the manufacturer's standard and/or custom color selection charts.

B. Vinyl - The vinyl coating shall be oven-cured poly-vinyl chloride plastisol with a minimum thickness of 1/8". The coating shall contain ultraviolet inhibitors and mold resistors. The color(s) of the vinyl coating shall be as selected by the Engineer from the manufacturer's standard and/or custom color selection charts.

C. Galvanized Finish - All components calling for a galvanized finish shall be hot-dipped galvanized to the manufacturer's standard after fabrication. All galvanized surfaces shall be free of burs, splinters, and sharp edges.

2.4 ADDITIONAL HARDWARE

A. Additional hardware shall be provided in sufficient quantity to complete assembly of the play equipment. All hardware shall be non-ferrous or if ferrous material is used shall be galvanized, electrostatic zinc plated or polyester powder coated in accordance with the approved manufacturer's standard. Provide the Engineer with any and all maintenance and repair supplies installation manuals, tool kits and materials shipped with each product for the Owner's inventory.

PART 3 - EXECUTION

3.1 EXAMINATION OF WORK AREA

A. Examine the areas and conditions under which work of this Section will be performed. Verify safety zones of all equipment before setting posts in concrete footings. Do not proceed until conditions detrimental to proper and timely completion of the work have been satisfactorily corrected and thus meet the manufacturer's instructions and the requirements as described above. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 INSTALLATION OF COMPOUND STRUCTURES AND INDEPENDENT ACTIVITIES
A. Conform strictly to manufacturer’s instructions using all appropriate materials, tools, and accessories as required. Use only experienced personnel trained in play equipment construction. The installer shall layout all equipment prior to construction to insure compliance with safety zone clearances.

B. Provide all concrete footings as required to properly place the equipment components. It is the Contractor’s responsibility to adjust drainage pipe or other new utility locations to accommodate the equipment footings.

C. Install Wear Mats under all swings and slide exits per Section 32 18 16.13 - Engineered Wood Safety Surfacing and per the plans and details.

3.3 PROTECTION

A. During construction of the play equipment structures, provide PVC web fence material in sufficient quantities and wrap the structures to prevent public access onto the equipment. Maintain the fencing wrap after completion of the play equipment and safety surfacing installation through Physical Completion of the project.

3.4 INSPECTION

A. Following the Engineer’s inspection of the completed play equipment installation, perform repairs as necessary to meet or exceed the Engineer’s requirements for fit and finish and the specifications and guidelines as referenced in 1.03 Safety Guidelines and Standards, above.

3.5 WARRANTY

A. The Contractor shall warranty that all work performed under this section shall be free from any defects in materials and workmanship. Upon notice in writing, within two (2) years of Physical Completion, from the Engineer to the Contractor shall, at no cost to the Owner, make all necessary repairs or replacements of the defective work in question. During this period of warranty, the Owner shall perform normal maintenance and cleaning of the play area equipment.

END OF SECTION
SECTION 12 93 00
SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section includes furnishing labor, materials, equipment and supplies as defined herein and as shown on the Drawings, including without limitation, procurement and installation of the following site furnishings:

1. Barbeque Grills.

1.2 RELATED REQUIREMENTS

a. 03 20 00 – Concrete Reinforcement

b. 03 35 13 – Concrete Floor and Architectural CIP Finishing

1.3 SUBMITTALS

A. Submit materials in accordance with 01 33 00 – Submittal Procedures. Furnish materials literature, product specifications and installation instructions for all products.

B. Submit the following to Owner’s Representative for approval a minimum of eight (8) weeks prior to start of work under this Section:

1. Product Data: Catalog cuts or other descriptive literature, including addresses and contact information for specified equipment and materials.

   a. Obtain approval from Owner’s Representative of products and materials prior to ordering.

1.4 REVIEW BY OWNER’S REPRESENTATIVE

A. Provide Owner’s Representative with a minimum (3) working days’ notice as to when the layout of site furnishings will be ready for review. Do not schedule review by Owner’s Representative until Contractor has confirmed that the specified site furnishings are undamaged and that the relevant requirements of the Plans and this Section have been met. Do not install site furnishings prior to Owner’s Representative’s approval of layout.

B. Failure to comply with the review and approval procedures described in this Section may require reinstallation at no additional expense to the Owner.

PART 2 - PRODUCTS

09/30/19
2.1 BARBEQUE GRILL

A. Barbeque Grill (BBQ GRILL) Acceptable products:
   1. Basis of Design: Pilot Rock Model Q-24 B2 Multilevel Grill with Tip-back Grate and
      grill cover.
   2. Approved equal products from other manufacturers.

B. Grill Salient Characteristics:
   1. 24 inches x 18 inches x 10 inches deep firebox (432 sq. in. cooking grate).
   2. Permanently attached theft-proof base attachment.
   3. Entire unit finished in non-toxic black enamel.
   4. Four cooking height levels.
   5. Tip up grate.
   6. Integral ash retainer flange.
   7. Public use-type grips of coiled steel bar.

PART 3 - EXECUTION

3.1 GENERAL

A. In general, the Work is to proceed as rapidly as the site becomes available.

B. Coordinate with concrete work

C. Remove debris from other trades prior to beginning work.

3.2 BARBEQUE GRILL

A. Install barbeque grills nested into concrete preparation tables as per the project
   drawings.

B. Install per manufacturer's guidelines.

C. Adjust openings in preparation tables based on actual size of barbeque grill utilized.

D. Fix grills to immobilize swivel option.

3.3 CLEAN UP

A. Clean paved surfaces and site furnishings during installation and upon completion of the
   Work;

B. Remove and dispose of excess materials, equipment packaging, shipping containers,
   debris and the like.

C. Apply touch up paint in accordance with Manufacturer’s recommendations to any flaws or
   minor damage on the site furnishings;

D. Repair any damage to the site resulting from installation of site furnishings as directed by
   Owner's Representative.
SECTION 22 05 00
COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Work includes the following: Provide materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of plumbing work for this project. Work includes support appurtenances, seismic restraint, and identification.

1.02 DEFINITIONS AND ABBREVIATIONS

A. For definitions and abbreviations, refer to Division 01, General Requirements. Additional abbreviations are as follows:

1. F Fahrenheit
2. psi Pounds per square inch
3. psig Pounds per square inch gauge pressure
4. V Volts

1.03 DRAWINGS AND SPECIFICATIONS

A. The Drawings are diagrammatic and do not show exact or complete piping configurations or the necessary number and types of fittings. Provide labor and materials required to complete the work indicated.

1.04 LAW AND ORDINANCES

A. General:

1. Mechanical work specified under this contract shall be in strict accordance with the latest rules and regulations of applicable codes.

2. Furnish and install work shown or specified which may be beyond requirements of ordinances, laws, regulations, and codes. This work shall be included within the construction contract.

B. Approval: file necessary plans, prepare documents and obtain necessary approval of governmental departments having jurisdiction and required certificates of inspection for work and deliver same to Owner in accordance with Division 01, General Requirements.

C. Permits, Certificates and Taxes: procure and pay for the necessary permits, certificates, and taxes for work as required in the General Requirements.
addition, perform ordinance and performance tests in the presence of the
Architect, and be responsible for advance notification. Submit copies of signed
and approved permits to the Architect.

1.05 MATERIAL REVIEW, SUBMITTALS AND SHOP DRAWINGS

A. General: Deliver material, submittal and shop drawing data in accordance with
the requirements of Division 01.

B. Standards Compliance and Certification: Where equipment or materials are
specified to conform with requirements of standards of recognized technical or
industrial organizations such as American National Standards Institute (ANSI),
American Society for Mechanical Engineers (ASME), Underwriters Laboratories
Refrigeration Institute (ARI), or National Electrical Manufacturer's Association
(NEMA), or National Electrical Manufacturer's Association (NEMA), that use a
label or published listing as a method of indicating compliance, proof of such
conformance shall be submitted and approved.

C. Substitution of Materials: See Section 01 61 00 – Substitution Request Form.

1.06 SINGLE SOURCE RESPONSIBILITY

A. Single-Source Responsibility: Comply with the requirements specified in Division
1 Section "Product Requirements”.

1.07 SAFETY AND PROTECTION

A. Drive Guards: Provide OSHA-approved drive and shaft guards for exposed,
rotating shafts and drive connections between motors and driven equipment.
Include steel frames securely fastened for easy removal to the equipment frame.
Provide tachometer cut-out at shafts where applicable.

B. Head Protection: Where pipe hangers, equipment support angles, and the like,
are exposed in walkways, or in access ways for any maintenance, cover such
potentially injurious protrusions less than 7' 2” above the floor with padding made
up of closed cell type insulation; secure and permanently fasten, and finish to
match adjacent finishes.

1.08 TESTING AND DEMONSTRATION

A. Demonstrate that equipment operates as indicated and in accordance with
manufacturer's recommendations. Perform tests in the presence of the Architect
and Owner; give minimum one-week notice prior to test. Provide instruments
and personnel required to conduct the tests.

1.09 OPERATIONS AND MAINTENANCE MANUALS

A. Operations and maintenance (O & M) manuals: Refer to Division 01.
B. O & M manuals shall include full descriptions of systems and products installed under this contract. Furnish complete narrative descriptions, product and originals of equipment descriptions with exploded diagrams, parts lists including part numbers, disassembly and assembly instructions and control wiring diagrams.

1.10 RECORD DOCUMENTS

A. Record documents: Refer to Division 01.

1.11 INSTRUCTION PERIODS FOR OWNER'S PERSONNEL

A. Description: Following installation of mechanical equipment and prior to acceptance of the mechanical work, conduct demonstrations and instruction periods to point out locations of servicing points and required points of maintenance to Owner's representative. Refer also to the requirements of Division 01.

B. General Description of Instruction Periods: Include preliminary discussion and presentation of information from maintenance manuals, with appropriate references to Contract Documents, followed by tour of systems explaining maintenance requirements, access methods, servicing and maintenance procedures, equipment cleaning procedures, control settings and available adjustments.

C. Scheduling of Instruction Periods: Provide notice of readiness to conduct such instruction and demonstration to Architect at least one week prior to the instruction periods.

1.12 PROJECT MEETINGS

A. Attend project meetings as described in Division 01. Project meetings shall include, but not be limited to, coordination meetings, as-built meetings, and pre-installation meetings.

PART 2 PRODUCTS

2.01 GENERAL

A. Comply with "Quality Assurance" provisions, Specifications, and Manufacturers' Data. Where these may be in conflict, the more stringent requirements govern.

2.02 ELECTRICAL ENCLOSURES

A. Electrical equipment shall be contained in an enclosure suitable for the environment where mounted. Enclosures shall be NEMA 3R where exposed to the weather. Other enclosures shall be per code or as noted.
2.03 EXPANSION SHELLS AND BOLTS
A. Expansion Shells for Rod Hangers: Phillips, Gregory, Omark, or Fastite in holes drilled in concrete.
B. Expansion Bolts for Equipment: USM or McCullough in holes drilled in concrete.

2.04 FORMED STEEL CHANNELS AT SLAB
A. Provide for equipment; number and size per manufacturer’s recommendations or as indicated.

2.05 ANCHOR BOLTS
A. Provide for equipment; number and size per manufacturers’ recommendations or as indicated.

2.06 SUPPLEMENTARY STEEL FRAMING
A. Standard structural steel shapes or Schedule 40 steel pipe, galvanized with extra-heavy finish.

2.07 SLEEVES
A. Materials, General: Schedule 40 galvanized steel pipe with unthreaded ends, or standard structural steel shapes.
B. Seal: Seal annulus with bolted compression type seal. Link Seal or accepted equal.

2.08 DIELECTRIC UNIONS
A. Provide at each joint between dissimilar metals.
B. The Dielectric Union shall be rated for 250 psi (ANSI B 16.39). The body and nut shall be steel with galvanized coat, the gaskets shall be EPDM, the insulator shall be nylon, and the tailpiece shall be brass.

2.09 WELDING TO BUILDING STRUCTURAL MEMBERS
A. Not allowed except as indicated.

2.10 NAMEPLATES
A. Laminated black plastic with lettering cut through to white background. Plastic strips with raised letters made by a marking device are not acceptable.
2.11 VALVE TAGS
   A. 0.030" thick brass, 1" diameter size; state the service and destination of the line controlled. Provide tag inscriptions made with a lettering device with 5/16" high cut lettering. Laminated plastic tags, construction similar to nameplates will also be acceptable.

2.12 PIPING IDENTIFICATION
   A. Self-adhesive, pre-printed identification labels indicating direction of flow and pipe contents, using common industry abbreviations.

2.13 SPECIAL MAINTENANCE MATERIALS
   A. Provide for equipment requiring frequent replacement of maintenance materials.

2.14 PAINTING
   A. Paint exposed fixtures and equipment. Coordinate color with Architect. Refer to Section 09 90 00 for paint and application requirements.

2.15 UNDERWRITERS' LABORATORY, INC. (UL) LISTED EQUIPMENT
   A. Whenever UL Standards exist for equipment with electrical components, provide UL-approved equipment bearing the UL label. Otherwise provide equipment certified in writing by the manufacturer as complying with UL Standards for similar items to the satisfaction of the governing agencies.

PART 3 EXECUTION

3.01 INSPECTION
   A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until any unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 PREPARATION
   A. Field Measurements: Field-verify locations of new and existing work prior to commencing work of this Section.
   B. Protect surrounding areas and surfaces to preclude damage from work of this Section.

3.03 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE
   A. Install, apply, erect, and perform the work in accordance with "Quality Assurance" provisions, Specifications, and manufacturers' installation instructions and directions. Where these may be in conflict, the more-stringent requirements govern.

09/30/19
3.04 CLEANING

A. Promptly remove waste material and rubbish caused by mechanical construction work. At completion of the project, clean equipment, piping and fixtures installed or provided under this Contract.

3.05 CUTTING AND PATCHING

A. Cut openings and holes required for mechanical work. Carefully examine existing conditions prior to commencing work. Refer to Section 01 73 29.

3.06 ACCESSIBILITY

A. Locate valves, controls, and the like, to be easily accessible.

B. Install equipment which requires periodic servicing or repairs to be readily accessible. Otherwise, obtain Engineers approval of location.

C. Provide access panels as indicated or required for piping, valve or equipment access. Minimum access panel size shall be 12 inch x 12 inch.

3.07 SPECIAL PROTECTION

A. Exercise maximum precaution to provide positive protection for the existing building and equipment from damage of any kind and prevent any water and dust seepage into the existing building.

B. Storage of materials: Make necessary provisions to prevent damage or corrosion of materials.

3.08 EQUIPMENT INSTALLATION

A. General: Provide supports for equipment and appurtenances as required, including braces as required for seismic restraint; these include frames or supports for pumps and mechanical equipment. Bracing shall conform to the requirements of IBC and UPC. Provide sizing and installation of supports for equipment and appurtenances as required, including braces as required for seismic restraint.

B. Suspended Equipment: Provide hangers from structure as required; span between structural members with additional structural steel as required to mount equipment in locations shown. Provide sizing and installation of these members. Do not fasten hangers to metal deck. Do not use powder actuated fasteners.

C. Floor-Mounted Equipment: Provide machine and floor or foundation fastenings; set equipment on concrete pads per Section 03 30 00. Provide equipment base drawings, bolt-setting information, and anchors for floor-mounted equipment. Provide concrete expansion anchors through concrete equipment pads, installed into existing structural concrete slabs.
D. Install equipment at the locations, and to the dimensions indicated. Set equipment accurately with principal centerlines and level, using manufacturers’ leveling screws, blocks, shims, or wedges. Do not distort equipment or baseplates.

3.09 PIPE SUPPORTS

A. Attach hangers and support rigidly to the building structure; provide supplementary steel framing and bracing at changes in pipe direction to resist thrust of flowing water. Provide seismic bracing as required by codes. Do not fasten hangers to metal deck. Do not use powder-actuated fasteners.

3.10 EXPANSION SHELLS AND BOLTS

A. Use only where necessary to support piping or equipment from existing concrete slabs or walls.

3.11 SLEEVES AND SEALING OF SLEEVES

A. Provide sleeving and sealing of sleeves for pipes.

B. Provide annular clear space of approximately 1/4" to 1/2"; size to accommodate insulation passing through sleeve where applicable.

C. Wherever piping passes through any floor slab above occupied space or equipment, provide pipe sleeves extending 1" above floor.

D. Set sleeves in place prior to pouring of concrete in new construction; core drill and grout sleeves in place for unit masonry construction and existing construction.

E. Sealing of sleeves through floor slabs: Provide material packed tightly within 1" of ends of sleeve and extending full depth through the wall or floor. Fill 1" of both ends of sleeve with a non-hardening silicone sealer. If required for under-floor containments, provide sheet metal around outside of item passing through sleeve before packing and sealing.

F. Install Link Seal in annular space between pipe and sleeve in accordance with the manufacturer’s written instructions.

3.12 NAMEPLATES

A. Provide for equipment; fasten mechanically.

3.13 VALVE TAGS

A. Provide on valves; fasten with brass chain to the valve stem.

09/30/19
3.14 PIPING IDENTIFICATION

A. Provide pipe identification labels on not less than 10-foot centers, and on both sides of a wall penetration so that a label is visible from a standing position on the floor, not more than 3-feet from the wall.

3.15 PAINTING

A. Refer to Division 09 90 00.

3.16 MISCELLANEOUS EQUIPMENT AND FIXTURE CONNECTIONS

A. Provide piping and make final mechanical connections in accordance with manufacturers' recommendations for Owner-furnished equipment and fixtures, and equipment and fixtures specified.

B. Perform on-site review and refer to manufacturers' shop drawings for details of connections. Provide rough-in at locations to conveniently serve items.

3.17 WIRING

A. Wiring shall conform to applicable sections of these specifications. Provide raceway and conductors as shown for remote control, or interlock connections. Coordinate other control wiring with Division 26 of the Specifications. Provide overload elements in controllers sized to match motor nameplate full load amperes. Space within controllers shall not be used as a junction box.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. This Section includes general duty valves common to several mechanical piping systems.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Special purpose valves are specified in other Division 22 piping system sections.

2. Valve tags and charts are specified in Division 22 Section "Common Work Results for Plumbing."

1.02 SUBMITTALS

A. General: Submit in accordance with Sections 01 33 00, Shop Drawings, Product Data, and Samples

B. Product Data for each valve type. Include body material, valve design, pressure and temperature classification, end connection details, seating materials, trim material and arrangement, dimensions and required clearances, and installation instructions. Include list indicating valve and its application.

C. Submit operations and maintenance data in conformance with Section 01 70 00, Closeout Submittals. Include detailed manufacturer's instructions on adjusting, servicing, disassembling, and repairing.

1.03 QUALITY ASSURANCE

A. Single-Source Responsibility: Comply with the requirements specified in Division 1 Section "Materials and Equipment," under "Source Limitations" Paragraph.

B. ASME Compliance: Comply with ASME B31.9 for building services piping and ASME B31.1 for power piping.

C. MSS Compliance: Comply with the various MSS Standard Practice documents referenced.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.

3. Set globe and gate valves closed to prevent rattling.

4. Set ball and plug valves open to minimize exposure of functional surfaces.

5. Block check valves in either closed or open position.

B. Use the following precautions during storage:

1. Maintain valve end protection.

2. Store indoors and maintain valve temperature higher than ambient dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

1.05 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

1. Gate Valves:
   a) Crane Company; Valves and Fitting Division.
   b) Hammond Valve Corporation.
   c) Milwaukee Valve Company, Inc.
   d) NIBCO Inc.
   e) Powell: Wm. Powell Company (The).
   f) Stockham Valves & Fittings, Inc.

2. Ball Valves:
   a) Conbraco Industries, Inc.; Apollo Division.
   b) Hammond Valve Corporation.
   c) Milwaukee Valve Company, Inc.
d) NIBCO Inc.

e) Stockham Valves & Fittings, Inc.

f) Tyler Pipe.

g) Victaulic Company of America.

3. Globe Valves:

a) Crane Company; Valves and Fitting Division.

b) Hammond Valve Corporation.

c) Milwaukee Valve Company, Inc.

d) NIBCO Inc.

e) Powell: Wm. Powell Company (The).

f) Stockham Valves & Fittings, Inc.

4. Swing Check Valves:

a) Crane Company; Valves and Fitting Division.

b) Hammond Valve Corporation.

c) Milwaukee Valve Company, Inc.

d) NIBCO Inc.

e) Stockham Valves & Fittings, Inc.

f) Victaulic Company of America.

2.02 BASIC, COMMON FEATURES

A. Design: Rising stem or rising outside screw and yoke stems, except as specified below.

1. Nonrising stem valves may be used only where headroom prevents full extension of rising stems.

B. Pressure and Temperature Ratings: As indicated in the "Application Schedule" of Part 3 of this Section and as required to suit system pressures and temperatures.

C. Sizes: Same size as upstream pipe, unless otherwise indicated.
D. Operators: Use specified operators and handwheels, except provide the following special operator features:

1. Handwheels: For valves other than quarter turn.
2. Lever Handles: For quarter-turn valves 6 inches and smaller, except for plug valves, which shall have square heads. Furnish Owner with one wrench for every 10 plug valves.

E. Extended Stems: Where insulation is indicated or specified, provide extended stems arranged to receive insulation.

F. Bypass and Drain Connections: Comply with MSS SP-45 bypass and drain connections.

G. Threads: ASME B1.20.1.


1. Caution: Where soldered end connections are used, use solder having a melting point below 840 deg F for gate, globe, and check valves; below 421 deg F for ball valves.

2.03 GATE VALVES

A. Gate Valves, 2-1/2 Inches and Smaller: MSS SP-80; Class 125, 200-psi cold working pressure (CWP), or Class 150, 300-psi CWP as required in Application Schedule; ASTM B 62 cast-bronze body and bonnet, solid-bronze wedge, copper-silicon alloy rising stem, teflon-impregnated packing with bronze packing nut, threaded or soldered end connections; and with aluminum, zinc plated steel, or malleable-iron handwheel.

2.04 BALL VALVES

A. Ball Valves, 4 Inches and Smaller: MSS SP-110, 600-psi CWP, ASTM B 584 bronze body, 2-piece or 3-piece construction as required in the Application Schedule; chrome-plated brass ball, full port for 3/4-inch valves and smaller and conventional port for 1-inch valves and larger; blowout proof; bronze or brass stem; teflon seats and seals; threaded or soldered end connections. Operator: Vinyl-covered steel lever handle.

1. Options:

a) Stem Extension: For valves installed in insulated piping (if required in Application Schedule).
2.05 GLOBE VALVES

A. Globe Valves, 2-1/2 Inches and Smaller: MSS SP-80; Class 125, 200-psi CWP, Class 150, 300-psi CWP or Class 300, 600-psi CWP as required in the Application Schedule; ASTM B 62 cast-bronze body and screwed bonnet, rubber, bronze, or teflon disc, silicon bronze-alloy stem, teflon-impregnated packing with bronze nut, threaded or soldered end connections; and with aluminum or malleable-iron handwheel.

2.06 CHECK VALVES

A. Swing Check Valves, 2-1/2 Inches and Smaller: MSS SP-80; Class 125, 200-psi CWP, Class 150, 300-psi CWP, or Class 300, 600-psi CWP as required in the Application Schedule; horizontal swing, Y-pattern, ASTM B 62 (ASTM B 61 for Class 300) cast-bronze body and cap, rotating bronze disc with renewable seat, threaded or soldered end connections.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine piping system for compliance with requirements for installation tolerances and other conditions affecting performance of valves. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

C. Operate valves from fully open to fully closed positions. Examine guides and seats made accessible by such operation.

D. Examine threads on valve and mating pipe for form and cleanliness.

E. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Check gasket material for proper size, material composition suitable for service, and freedom from defects and damage.

F. Do not attempt to repair defective valves; replace with new valves.

3.02 INSTALLATION

A. Install valves as indicated, according to manufacturer's written instructions.

B. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate the general arrangement of piping, fittings, and specialties.

C. Install valves with unions or flanges at each piece of equipment arranged to allow servicing, maintenance, and equipment removal without system shutdown.
D. Locate valves for easy access and provide separate support where necessary.

E. Install valves in horizontal piping with stem a minimum of 30° above horizontal at or above the center of the pipe.

F. Install valves in a position to allow full stem movement.

G. Installation of Check Valves: Install for proper direction of flow as follows:
   1. Swing Check Valves: Horizontal position with hinge pin level or vertical upflow position.

3.03 Soldered Connections (For Domestic Water Systems Only)

A. Cut tube square and to exact lengths.

B. Clean end of tube to depth of valve socket with steel wool, sand cloth, or a steel wire brush to a bright finish. Clean valve socket.

C. Apply proper soldering flux in an even coat to inside of valve socket and outside of tube.

D. Open gate and globe valves to fully open position.

E. Remove the cap and disc holder of swing check valves having composition discs.

F. Insert tube into valve socket, making sure the end rests against the shoulder inside valve. Rotate tube or valve slightly to ensure even distribution of the flux.

G. Apply heat evenly to outside of valve around joint until solder melts on contact. Feed solder until it completely fills the joint around tube. Avoid hot spots or overheating valve. Once the solder starts cooling, remove excess amounts around the joint with a cloth or brush.

3.04 Threaded Connections

A. Note the internal length of threads in valve ends and proximity of valve internal seat or wall to determine how far pipe should be threaded into valve.

B. Align threads at point of assembly.

C. Apply appropriate tape or thread compound to the external pipe threads, except where dry seal threading is specified.

D. Assemble joint, wrench tight. Wrench on valve shall be on the valve end into which the pipe is being threaded.

3.05 Flanged Connections

A. Align flange surfaces parallel.
B. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly with a torque wrench.

3.06 VALVE END SELECTION

A. Select valves with the following ends or types of pipe/tube connections:

1. Copper Tube Size, 2 Inches and Smaller: Threaded ends, except solder ends can be used for plumbing cold water, hot water and non-potable water systems.

3.07 APPLICATION SCHEDULE

A. General Application: Use gate and ball valves for shutoff duty; globe for throttling duty as indicated. Refer to piping system Specification Sections for specific valve applications and arrangements.

B. Domestic Water Systems: Use the following valve types:

1. Gate Valves: Class 125.
2. Ball Valves: 2-piece with stem extension.
4. Swing Check Valve: Class 125.

3.08 ADJUSTING

A. Adjust or replace packing after piping systems have been tested and put into service, but before final adjusting and balancing. Replace valves if leak persists.

END OF SECTION
SECTION 22 05 29
HANGERS AND SUPPORTS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SUMMARY
A. Section includes pipe hangers and support for plumbing work.

1.02 REFERENCES
A. The most recent edition of the following is hereby referenced.
B. American National Standards Institute, Inc. (ANSI)
1. B1.1 Unified Inch Screw Threads
2. B2.1 Pipe Threads (Except Dry Seal)
3. B16.1 Cast-Iron Pipe Flanges & Flanged Fittings, 125, and 250 psi
4. B16.3 Malleable Iron Thread Fittings, Class 150 and 300 Pound
5. B16.5 Steel Pipe Flanges & Flanged Fittings
6. B16.18 Cast Copper Alloy Solder Joint Fittings
7. B16.22 Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings
8. B18.2.1 Square and Hex Bolts and Screws
C. American Society for Testing and Materials (ASTM)
1. A36 Structural Steel
2. A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded, and Seamless
3. A120 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated (Galvanized), Welded and Seamless, for Ordinary Uses
4. A47 Malleable Iron Castings
5. A183 Heat-Treated, Carbon-Steel Track Bolts and Carbon-Steel Nuts
7. A181 Forgings, Carbon Steel for General Purpose Piping

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8. A307 Carbon Steel Externally-Threaded Standard Fasteners
9. A536 Ductile Iron Castings
10. B32 Solder Metal
11. B61 Seam or Valve Bronze Casting
12. B62 Composition Bronze or Ounce-Metal Castings
13. B88 Seamless Copper Water Tube

D. Federal Specification (Fed. Spec.)
   1. A-A-1192A Hangers and Supports, Pipe

E. Manufacturers' Standardization Society (MSS)
   1. MSS SP-69 Pipe Hangers and Supports - Selection and Application

1.03 SUBMITTALS
A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.
B. Product Data: Pipe, Hangers and Support

1.04 QUALITY ASSURANCE
A. Regulatory Requirements: Comply with all applicable City, County, and State Codes and ordinances. In case of conflict with drawings or specifications, the codes and ordinances govern.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Use the following precautions during storage:
   1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

1.06 WARRANTY
A. Comply with provisions of Section 01 78 70, Warranties and Bonds.
PART 2 PRODUCTS

2.01 GENERAL

A. Comply with "Quality Assurance" provisions, Specifications, and Manufacturers' Data. Where these may be in conflict, the more stringent requirements govern.

2.02 PIPE HANGERS AND SUPPORTS


B. Acceptable Manufacturers: ITT-Grinnell, Fee & Mason, Elcen, Unistrut, Powerstrut, Superstrut, or approved.

C. Materials

1. Match piping material at point of contact with piping; carbon steel, cast iron or malleable iron for black steel pipe; carbon steel, iron or malleable with zinc coating or cadmium-plated for galvanized steel pipe; carbon steel or malleable iron with copper finish or PVC plastic coated for copper pipe or plastic pipe.

2. Rods: Hot rolled steel, ASTM A36. Size in conformance with the following:

<table>
<thead>
<tr>
<th>Rod Diameter (Inches)</th>
<th>Pipe Size (Inches)</th>
<th>Load at 650F (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8</td>
<td>2 and smaller</td>
<td>610</td>
</tr>
<tr>
<td>1/2</td>
<td>2-1/2 to 3-1/2</td>
<td>1,130</td>
</tr>
<tr>
<td>5/8</td>
<td>4 and 5</td>
<td>1,810</td>
</tr>
<tr>
<td>3/4</td>
<td>6</td>
<td>2,710</td>
</tr>
<tr>
<td>7/8</td>
<td>8 to 12</td>
<td>3,770</td>
</tr>
</tbody>
</table>

D. Components

1. Ring Hangers:

a) 2" and smaller: Adjustable swivel type, Grinnell 97 or 104.

b) 2-1/2" and larger: Adjustable split-ring swivel type, Grinnell Figure 104.

2. Clevis Hangers: Grinnell Figure 260
3. Trapeze Hangers and Multiple Pipe Supports: Structural steel shapes in conformance with Section 05 12 00, supported by rods or structural steel shapes as required.

4. Horizontal Pipes at Walls:
   a) 2-1/2" and smaller: Malleable-iron, one-hole clamp, Grinnell 126.
   b) 3" and larger: Welded-steel bracket, Grinnell Figure 213, 194, 195, 199, used in conjunction with ring or clevis hangers.

5. Vertical Pipes at Walls:
   a) 1" and smaller: Galvanized steel pre-formed metal shapes, Unistrut P1100 Series with P2024 clamps for O.D. tubing and P2909 clamps for pipe.
   b) 2-1/2" and smaller: Galvanized steel pre-formed metal shapes, Unistrut P1100 Series with P2558 pipe straps.
   c) 3" and larger: Welded-steel brackets as specified for horizontal pipes at walls, connected to Grinnell Figure 212 pipe clamp with Figure 110R eye socket.

6. Insulation Protection: Coordinate with insulation subcontractor, Section 22 07 00.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until any unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 PREPARATION
   A. Field Measurements: Field verify locations of new and existing work prior to commencing work of this Section.
   B. Protect surrounding areas and surfaces to preclude damage from work of this Section.

3.03 INSTALLATION, APPLICATION, ERECTION AND PERFORMANCE
   A. Install, apply, erect, and perform the work in accordance with "Quality Assurance" provisions, Specifications, and manufacturers' written installation instructions and directions. Where these may be in conflict, the more stringent requirements govern.
B. Thrust bracing shall be affixed to fittings with metallic clamp devices with minimum 1-1/4” schedule 40 pipe struts. Paint metallic parts for corrosion protection. Meet requirement of NFPA-13 for fire sprinkler piping thrust bracing.

3.04 PIPE HANGERS AND SUPPORTS

A. Spacing of Hangers and Supports

1. Maximum Spacing between supports for straight runs of piping:

<table>
<thead>
<tr>
<th>Nominal Pipe Size (Inches)</th>
<th>Maximum Span (Feet) Steel</th>
<th>Maximum Span (Feet) Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>1 1/2</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>2 1/2</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>10</td>
</tr>
</tbody>
</table>

2. Support piping independent from connected equipment. Provide additional hangers or supports at concentrated loads such as flanges, valves, equipment, and similar items.

B. In general, route vertical piping in a manner in which it can be attached to adjacent walls or columns.

C. Anchoring, Guiding and Supporting Piping

1. Anchor piping and support in a manner such that expansion and contraction will take place in the direction desired.

2. Prevent vibration with vibration dampers and prevent undue strains on equipment served.

3. Fabricate hangers used for the support of 2” nominal pipe size and larger piping to permit adequate adjustment after erection while still supporting the load.

4. Use wall brackets where the pipes are adjacent to walls or other vertical supports which may be used for supports.

5. Provide supports to adequately carry the weight of the lines and maintain proper alignment.

6. Provide inserts and sleeves for supports in concrete where necessary.
7. Provide pipe guides and anchors at points where necessary to keep pipes in accurate alignment, to direct the expansion movement, and to prevent buckling, swaying and undue strain.

8. Provide seismic bracing and thrust bracing on piping.

D. Insulation Protection: Provide insulated piping with a pipe insulation protection device at each support.

END OF SECTION
SECTION 22 05 33
HEAT TRACING FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SUMMARY
A. Furnish and install a UL listed system of electric self-regulating heating cable and components for maintaining the water temperature in the pipes as indicated on the drawings.

1.02 SUBMITTALS
A. Copy of UL file indicating the heating cable is specifically listed to provide freeze-protection.
B. Manufacturer's catalog cuts showing materials and performance data.

1.03 DELIVERY, STORAGE, AND HANDLING
A. Use the following precautions during storage:
   1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

PART 2 PRODUCTS

2.01 CONSTRUCTION
A. The self-regulating heating cable shall consist of two (2) 16-AWG nickel-coated copper bus wires embedded in a radiation-crosslinked conductive polymer core. It shall be covered by a radiation-crosslinked, polyolefin, dielectric jacket and enclosed in a tinned copper braid of 14 AWG equivalent ware size. The braid shall be covered with a (nominal) 40-mil polyolefin outer jacket, color coded for easy identification. The cable shall be specifically designed, manufactured, and UL listed for freeze-protection.

2.02 MECHANICAL
A. The cable shall have a minimum cut-through resistance of 600 lb per CSA 22.2 0.3. Cutting test 4.14. The cable shall have a minimum impact resistance of 25 ft lb per UL 1588.11. The cable shall withstand a glancing impact of 22 ft lb per UL 1581.590. The cable shall have a minimum abrasion resistance of 7000 cycles per UL 719.19. The cable shall withstand a crush resistance of 4500 N per IEEE 515 Deformation Test 5.1.5.
2.03 EXPERIENCE

A. The manufacturer shall have more than ten years experience with self-regulating heating cables for temperature maintenance of domestic hot water.

B. The manufacturer's Quality Assurance Program shall be certified to ISO 9001 standard.

2.04 ACCEPTABLE MANUFACTURER

A. Basis for Design: Pentair Raychem XL Trace. Approved equal by Thermon or Chromalox.

PART 3 EXECUTION

3.01 OPERATING TEMPERATURES

A. The freeze protection system shall not exceed a nominal temperature of 40°F.

3.02 MAINTENANCE TEMPERATURE

A. Each freeze protection system shall be maintained using only one product. Temperatures shall be maintained with straight runs of heating cable on the pipe. The use of a 40°F fixed thermostat shall ensure heating cable is off when pipe temperature is over 40°F.

3.03 INSTALLATION

A. The system shall be installed by factory trained certified installers.

B. The system shall be installed according to the drawings and the manufacturer's instruction. The installer shall be responsible for providing a functional system, installed in accordance with applicable national and local code requirements. Each circuit shall be protected with a 30-mA ground-fault protection device.

C. Electrical Connections: The following requirements apply:

1. Electrical power wiring is specified in Division 26.

2. Contractor shall coordinate electrical requirements with Division 26 as required to fully maintain the water temperature in the pipes as indicated on the drawings.

3.04 TESTING

A. Procedure: Measure the heater circuit continuity and the insulation resistance between the braid and bus wires with a 2500-Vdc megohmmeter (megger).
B. Acceptable Results: The heater circuit shall be continuous and megger readings shall be at least 20 megohms regardless of heater length. Circuits yielding unacceptable readings must be repaired or replaced.

C. Submittal of Results: Submit records of the test data to the Architect.

**END OF SECTION**
SECTION 22 07 00
PLUMBING INSULATION

PART 1  GENERAL

1.01  SUMMARY

A. This Section includes preformed, rigid and flexible pipe insulation; insulating cements; field-applied jackets; accessories and attachments; and sealing compounds.

B. Related Sections include the following:

1. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.

2. Division 22 Section "Hangers and Supports for Plumbing Piping" for pipe insulation shields and protection saddles.

1.02  SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product Data: Identify thermal conductivity, thickness, and jackets (both factory and field applied, if any), for each type of product indicated.

1.03  QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: As determined by testing materials identical to those specified in this Section according to ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and sealer and cement material containers with appropriate markings of applicable testing and inspecting agency.

B. Insulation Installed Indoors: Flame-spread rating of 25 or less, and smoke-developed rating of 50 or less.

1.04  DELIVERY, STORAGE, AND HANDLING

A. Packaging: Ship insulation materials in containers marked by manufacturer with appropriate ASTM specification designation, type and grade, and maximum use temperature.

B. Use the following precautions during storage:
1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

1.05 COORDINATION
A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 22 Section "Hangers and Supports for Plumbing Piping."
B. Coordinate clearance requirements with piping Installer for insulation application.

1.06 SCHEDULING
A. Schedule insulation application after testing piping systems. Insulation application may begin on segments of piping that have satisfactory test results.

1.07 WARRANTY
A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

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

1. Mineral-Fiber Insulation:
   a) CertainTeed Manson.
   b) Knauf FiberGlass GmbH.
   c) Owens-Corning Fiberglas Corp.
   d) Johns Manville.

2. Lavatory and Sink ADA Piping Guards:
   a) Truebro or approved equal.

2.02 INSULATION MATERIALS
A. Mineral-Fiber Insulation: Glass fibers bonded with a thermosetting resin complying with the following:

1. Preformed Pipe Insulation: Comply with ASTM C 547, Type 1, with factory-applied, all-purpose, vapor-retarder jacket.

2. Blanket Insulation: Comply with ASTM C 553, Type II, without facing.
3. Fire-Resistant Adhesive: Comply with MIL-A-3316C in the following classes and grades:
   a) Class 1, Grade A for bonding glass cloth and tape to unfaced glass-fiber insulation, for sealing edges of glass-fiber insulation, and for bonding lagging cloth to unfaced glass-fiber insulation.
   b) Class 2, Grade A for bonding glass-fiber insulation to metal surfaces.

4. Vapor-Retarder Mastics: Fire- and water-resistant, vapor-retarder mastic for indoor applications. Comply with MIL-C-19565C, Type II.


B. Prefabricated Thermal Insulating Fitting Covers: Comply with ASTM C 450 for dimensions used in preforming insulation to cover valves, elbows, tees, and flanges.

2.03 FIELD-APPLIED JACKETS

A. General: ASTM C 921, Type 1, unless otherwise indicated.


C. PVC Jacket: High-impact, ultraviolet-resistant PVC; 20 mils thick; roll stock ready for shop or field cutting and forming.
   1. Adhesive: As recommended by insulation material manufacturer.
   2. PVC Jacket Color: White or gray.
   3. PVC Jacket Color: Color-code piping jackets based on materials contained within the piping system.

D. Standard PVC Fitting Covers: Factory-fabricated fitting covers manufactured from 20-mil-thick, high-impact, ultraviolet-resistant PVC.
   1. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories for the disabled.
   2. Adhesive: As recommended by insulation material manufacturer.
2.04 ACCESSORIES AND ATTACHMENTS

A. Glass Cloth and Tape: Comply with MIL-C-20079H, Type I for cloth and Type II for tape. Woven glass-fiber fabrics, plain weave, pre-sized a minimum of 8-oz./sq. yd.

1. Tape Width: 4 inches.

B. Bands: ¾-inch wide, in one of the following materials compatible with jacket:

1. Stainless Steel: ASTM A 666, Type 304; 0.020 inch thick.
2. Galvanized Steel: 0.005 inch thick.
3. Aluminum: 0.007 inch thick.
4. Brass: 0.010 inch thick.
5. Nickel-Copper Alloy: 0.005 inch thick.

C. Wire: 0.080-inch, nickel-copper alloy; 0.062-inch, soft-annealed, stainless steel; or 0.062-inch, soft-annealed, galvanized steel.

2.05 THERMAL INSULATION REMOVABLE PADS

A. The inner and outer jacketing on the removable pads shall be Lewco 1550 SA silicone impregnated.

B. The insulation material inside the pads shall be Owens/Corning fiberglass thermal insulating wool.

C. Lacing hooks, and washers shall be Lewco, or equal.

D. Tie wire shall be stainless steel.

E. Fasteners shall be stainless steel staples STCR 5019-3/8-inch, or equal.

F. Thickness for all pads: 2-inch thick thermal insulating wool.

2.06 VAPOR RETARDERS

A. Mastics: Materials recommended by insulation material manufacturer that are compatible with insulation materials, jackets, and substrates.

2.07 LAVATORY AND SINK ADA PIPING GUARDS

A. ADA compliant under-sink protection for p-traps and angle valves and supply tubes. Preformed insulated pipe covers.
PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Preparation: Clean and dry pipe and fitting surfaces. Remove materials that will adversely affect insulation application.

3.03 GENERAL APPLICATION REQUIREMENTS

A. Apply insulation materials, accessories, and finishes according to the manufacturer's written instructions; with smooth, straight, and even surfaces; free of voids throughout the length of piping, including fittings, valves, and specialties.

B. Refer to schedules at the end of this Section for materials, forms, jackets, and thicknesses required for each piping system.

C. Use accessories compatible with insulation materials and suitable for the service. Use accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Apply insulation with longitudinal seams at top and bottom of horizontal pipe runs.

E. Apply multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Seal joints and seams with vapor-retarder mastic on insulation indicated to receive a vapor retarder.

H. Keep insulation materials dry during application and finishing.

I. Apply insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by the insulation material manufacturer.

J. Apply insulation with the least number of joints practical.

K. Apply insulation over fittings, valves, and specialties, with continuous thermal and vapor-retarder integrity, unless otherwise indicated. Refer to special instructions for applying insulation over fittings, valves, and specialties.
L. Hangers and Anchors: Where vapor retarder is indicated, seal penetrations in insulation at hangers, supports, anchors, and other projections with vapor-retarder mastic.

1. Apply insulation continuously through hangers and around anchor attachments.

2. For insulation application where vapor retarders are indicated, extend insulation on anchor legs at least 12 inches from point of attachment to pipe and taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.

3. Install insert materials and apply insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by the insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect the jacket from tear or puncture by the hanger, support, and shield.

M. Insulation Terminations: For insulation application where vapor retarders are indicated, taper insulation ends. Seal tapered ends with a compound recommended by the insulation material manufacturer to maintain vapor retarder.

N. Apply adhesives and mastics at the manufacturer's recommended coverage rate.

O. Apply insulation with integral jackets as follows:

1. Pull jacket tight and smooth.

2. Circumferential Joints: Cover with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip and spaced 4 inches o.c.

3. Longitudinal Seams: Overlap jacket seams at least 1-1/2 inches. Apply insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.

4. Exception: Do not staple longitudinal laps on insulation having a vapor retarder.

5. Vapor-Retarder Mastics: Where vapor retarders are indicated, apply mastic on seams and joints and at ends adjacent to flanges, unions, valves, and fittings.

6. At penetrations in jackets for thermometers and pressure gages, fill and seal voids with vapor-retarder mastic.
P. Interior Wall and Partition Penetrations: Apply insulation continuously through walls and floors.

3.04 MINERAL-FIBER INSULATION APPLICATION

A. Apply insulation to straight pipes and tubes as follows:
   1. Secure each layer of preformed pipe insulation to pipe with wire, tape, or bands without deforming insulation materials.
   2. Where vapor retarders are indicated, seal longitudinal seams and end joints with vapor-retarder mastic. Apply vapor retarder to ends of insulation at intervals of 15 to 20 feet to form a vapor retarder between pipe insulation segments.
   3. For insulation with factory-applied jackets, secure laps with outward clinched staples at 6 inches o.c.
   4. For insulation with factory-applied jackets with vapor retarders, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by the insulation material manufacturer and seal with vapor-retarder mastic.

B. Apply insulation to flanges as follows:
   1. Apply preformed pipe insulation to outer diameter of pipe flange.
   2. Make width of insulation segment the same as overall width of the flange and bolts, plus twice the thickness of the pipe insulation.
   3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with mineral-fiber blanket insulation.
   4. Apply canvas jacket material with manufacturer's recommended adhesive, overlapping seams at least 1 inch, and seal joints with vapor-retarder mastic.

C. Apply insulation to fittings and elbows as follows:
   1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.
   2. When premolded insulation elbows and fittings are not available, apply mitered sections of pipe insulation, or glass-fiber blanket insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire, tape, or bands.
   3. Cover fittings with standard PVC fitting covers.
D. Apply insulation to valves and specialties as follows:

1. Apply premolded insulation sections of the same material as straight segments of pipe insulation when available. Secure according to manufacturer's written instructions.

2. When premolded insulation sections are not available, apply glass-fiber blanket insulation to valve body. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation. For check valves, arrange insulation for access to stainer basket without disturbing insulation.

3. Apply insulation to flanges as specified for flange insulation application.


5. For larger sizes where PVC fitting covers are not available, seal insulation with canvas jacket and sealing compound recommended by the insulation material manufacturer.

3.05 FIELD-APPLIED JACKET APPLICATION

A. Apply glass-cloth jacket, where indicated, directly over bare insulation or insulation with factory-applied jackets.

1. Apply jacket smooth and tight to surface with 2-inch overlap at seams and joints.

2. Embed glass cloth between two 0.062-inch thick coats of jacket manufacturer's recommended adhesive.

3. Completely encapsulate insulation with jacket, leaving no exposed raw insulation.

B. Foil and Paper Jackets: Apply foil and paper jackets where indicated.

1. Draw jacket material smooth and tight.

2. Apply lap or joint strips with the same material as jacket.

3. Secure jacket to insulation with manufacturer's recommended adhesive.

4. Apply jackets with 1-1/2-inch laps at longitudinal seams and 3-inch wide joint strips at end joints.

5. Seal openings, punctures, and breaks in vapor-retarder jackets and exposed insulation with vapor-retarder mastic.
C. Apply PVC jacket where indicated, with 1-inch overlap at longitudinal seams and end joints. Seal with manufacturer's recommended adhesive.

D. Apply metal jacket where indicated, with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.06 PIPING SYSTEM APPLICATIONS

A. Insulation materials and thicknesses are specified in schedules at the end of this Section.

B. Items Not Insulated: Unless otherwise indicated, do not apply insulation to the following systems, materials, and equipment:

1. Flexible connectors.
2. Vibration-control devices.
3. Below-grade piping, unless otherwise indicated.
4. Chrome-plated pipes and fittings, unless potential for personnel injury.
5. Unions, strainers, check valves, plug valves, and flow regulators.

3.07 THERMAL INSULATION REMOVABLE PADS

A. All flanges and valves including control valves, gate valves and butterfly valves shall be insulated with removable pads for systems that are indicated under the applications schedule.

3.08 ADA PIPE COVERS

A. Apply pre-formed pipe covers to all under-fixture waste piping and stops/supplies on ADA lavatories and sinks. Install insulated covers in accordance with the manufacturer's written instructions.

3.09 INSULATION APPLICATION SCHEDULE, GENERAL

A. Refer to insulation application schedules for required insulation materials, vapor retarders, and field-applied jackets.

B. Application schedules identify piping system and indicate pipe size ranges and material, thickness, and jacket requirements.

3.10 INTERIOR INSULATION APPLICATION SCHEDULE

A. Service: Domestic hot water.
1. Operating Temperature: 60 to 140 deg F.
2. Insulation Material: Mineral fiber.
3. Insulation Thickness: Apply the following insulation thicknesses:
   a) Copper Pipe, 1/2-inch – 1-inch: 1-inch.
5. Vapor Retarder Required: No.
6. Finish: None.
7. Insulation Conductivity Range: 0.24 – 0.28 BTU·in/(hr·ft²·°F).

B. Service: Domestic cold water.
1. Operating Temperature: 35 to 60 deg F.
2. Insulation Material: Mineral fiber.
3. Insulation Thickness: Apply the following insulation thicknesses:
   a) Copper Pipe, all sizes: 1-inch.
5. Vapor Retarder Required: Yes.
6. Finish: None.
7. Insulation Conductivity Range: 0.23 – 0.27 BTU·in/(hr·ft²·°F).

C. Service: Exposed sanitary drains and domestic water supplies and stops for fixtures for the disabled.
1. Operating Temperature: 35 to 120 deg F.
2. Insulation Material: Mineral fiber.
5. Vapor Retarder Required: No.
6. Finish: None.
7. Insulation Conductivity Range: 0.24 – 0.28 BTU·in/(hr·ft²·°F).
8. Truebro Lav Guard by IPS Corp. or equal.

END OF SECTION
CITY OF KIRKLAND
JUANITA BEACH PARK BATHHOUSE
DOMESTIC WATER PIPING

SECTION 22 11 13
DOMESTIC WATER PIPING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes water distribution piping from locations indicated to fixtures and equipment inside building.

B. Related Sections include the following:

1. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.

2. Division 22 Section "Domestic Water Piping Specialties" for water distribution piping specialties.

3. Division 22 Section "Hangers and Supports for Plumbing Piping" for pipe hangers and seismic restraints.

4. Division 22 Section "Plumbing Insulation" for pipe insulation requirements.

1.02 DEFINITIONS

A. Water Distribution Piping: Water piping inside building that conveys water to fixtures and equipment throughout the building.

1.03 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.

B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.


PART 2 PRODUCTS

2.01 PIPE AND TUBE MATERIALS

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.
B. Soft Copper Tubing: ASTM B 88, Type K, water tube, annealed temper.

C. Hard Copper Tube: ASTM B 88, Type L, water tube, drawn temper.

2.02 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper.

C. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.

D. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends. Include threads conforming to ASME B1.20.1 on threaded ends.

2.03 JOINING MATERIALS

A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

B. Refer to Division 22 Section "Common Work Results for Plumbing" for commonly used joining materials.

C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.

D. Brazing Filler Metal: AWS A5.8, BCuP, copper phosphorus or BAg, silver classification.

E. Transition Couplings: Coupling or other manufactured fitting same size as, with pressure rating at least equal to, and with ends compatible with piping to be joined.

2.04 VALVES

A. Refer to Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty valves.

B. Refer to Division 22 Section "Domestic Water Piping Specialties" for special-duty valves.
PART 3 EXECUTION

3.01 PIPING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Belowground, Water Distribution Piping: Use the following:
   1. 4-Inch NPS and Smaller: Soft copper tube, Type K; copper, solder-joint fittings; and soldered joints.

D. Aboveground, Water Distribution Piping: Use the following:
   1. 4-Inch NPS and Smaller: Hard copper tube, Type L; solder-joint pressure fittings; and brazed joints.

3.02 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
   1. Shutoff Duty: Use gate or ball valves.

3.03 PIPING INSTALLATION, GENERAL

A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping installation.

3.04 WATER DISTRIBUTION PIPING INSTALLATION

A. Install piping with 0.25 percent slope downward toward drain.

3.05 JOINT CONSTRUCTION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.

3.06 VALVE INSTALLATION

A. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use gate or ball valves for piping 2-inch NPS and smaller.

B. Shutoff Valves: Install shutoff valves on each water supply to equipment, close to main, on each plumbing fixture without supply stops, and where indicated. Use ball valves for piping 2-inch NPS and smaller.
C. Drain Valves: Install hose end drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
   1. Install hose-end drain valves at low points in water mains, risers, and branches.
   2. Install stop-and-waste drain valves where indicated.

D. Compressed Air Fittings: Where gravity drainage is not adequate for draining the water piping (such as underground water lines), provide a compressed air fitting with a water shutoff. Compressed air fitting shall be standard compressed air quick connect plug. Install compressed air fittings in accessible locations.

### 3.07 HANGER AND SUPPORT INSTALLATION

A. Refer to Division 22 Section "Hangers and Supports" for pipe hanger and support devices. Install the following:

   1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.
   2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs of cold water and hot water 100 feet and less.
   3. Adjustable roller hangers, MSS Type 43, for individual, straight, horizontal runs of hot water longer than 100 feet.
   4. Pipe rolls, MSS Type 44, for multiple, straight, horizontal runs of hot water 100 feet or longer. Support pipe rolls on trapeze.
   5. Spring hangers, MSS Type 52, for supporting base of vertical runs.
   6. Install supports and seismic restraints according to Division 22 Section "Hangers and Supports for Plumbing Piping."

B. Support vertical piping and tubing at base and at each floor and at maximum distance of 15 feet (whichever is less).

C. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

D. Provide horizontal pipe hanger spacing and rod diameters as scheduled in Division 22 Section "Hangers and Supports for Plumbing Piping." Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

### 3.08 CONNECTIONS

A. Connect service entrance piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.
B. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:

1. Plumbing Fixtures: Connect hot- and cold-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Plumbing Fixtures."

2. Equipment: Connect hot- and cold-water supply piping as indicated. Provide shutoff valve and union for each connection.

3.09 FIELD QUALITY CONTROL

A. Inspect water distribution piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

   a) Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

   b) Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test water distribution piping as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.

3. Cap and subject piping to static water pressure of 150 psig or 1-1/2 times the operating pressure, whichever is greater, without exceeding pressure.
rating of piping system materials. Isolate test source and allow to stand for 24 hours. Leaks and loss in test pressure constitute defects that must be repaired.

4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.

5. Prepare and submit reports for tests and required corrective action.

3.10 CLEANING

A. Clean and disinfect potable-water distribution piping as follows:

1. Purge new piping and parts of existing water piping that have been altered, extended, or repaired before using.

2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, procedure described in either AWWA C651 or AWWA C652 or as described below:

   a) Flush piping system with clean, potable water until dirty water does not appear at outlets.

   b) Fill and isolate system according to either of the following:

      1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.

      2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for 3 hours.

   c) Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.

   d) Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows contamination.

B. Prepare and submit reports for purging and disinfecting activities.

C. Clean interior of piping system. Remove dirt and debris as work progresses.

3.11 START-UP PROCEDURES

A. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.
B. Perform the following steps before putting into operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
5. Remove and clean strainer screens. Close drain valves and replace drain plugs.
6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and that cartridges are clean and ready for use.

C. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

D. Check plumbing specialties and verify proper settings, adjustments, and operation.

1. Water-Pressure Regulators: Set outlet pressure at 80 psig maximum, unless otherwise indicated.

END OF SECTION
SECTION 22 11 19
DOMESTIC WATER PIPING SPECIALTIES

PART 1  GENERAL

1.01  SUMMARY

A. This Section includes plumbing specialties for water distribution systems.

B. Related Sections include the following:

1. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.

2. Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty ball, butterfly, check, gate, and globe valves.

3. Division 22 Section "Domestic Water Piping" for water-supply piping and connections.

4. Division 22 Section "Hangers and Supports for Plumbing Piping" for pipe hangers and seismic restraints.

1.02  SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:


1.03  SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product Data: For each plumbing specialty indicated. Include rated capacities of selected equipment and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:

1. Backflow preventers.

2. Strainers.

3. Hose bibbs.
4. Miscellaneous piping specialties.

5. Water pressure regulators.

C. Reports: Specified in "Field Quality Control" Article.

1.04 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on plumbing specialties made to specified standards.

B. Listing and Labeling: Provide electrically operated plumbing specialties specified in this Section that are listed and labeled.

  1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.

C. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.


1.05 EXTRA MATERIALS

A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

  1. Operating Key Handles: Furnish one extra key for each key-operated hose bibb and hydrant installed.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Use the following precautions during storage:

  1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

1.07 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

  1. Backflow Preventers:
a) Ames Co., Inc.
b) Cla-Val Co.
c) CMB Industries; Febco Div.
d) Conbraco Industries, Inc.
e) FLOMATIC Corp.
f) Grinnell Corp.; Mueller Co. Marketing Group for Hersey Products Div.
g) IMI Cash Valve.
h) Watts Industries, Inc.; Water Products Div.
i) Zurn Industries, Inc.; Wilkins Div.

2. Strainers:
   a) Ames Co., Inc.
   b) Cla-Val Co.
   c) CMB Industries; Febco Div.
   d) Conbraco Industries, Inc.
   e) FLOMATIC Corp.
   f) Grinnell Corp.; Mueller Co. Marketing Group for Hersey Products Div.
   g) IMI Cash Valve.
   h) Watts Industries, Inc.; Water Products Div.
   i) Zurn Industries, Inc.; Wilkins Div.

3. Hose bibbs:
   a) Acorn Engineering Company
   b) Josam Co.
   c) Jay R. Smith Mfg. Co.
   d) Tyler Pipe; Wade Div.

f) Woodford Manufacturing Co.

g) Zurn Industries, Inc.; Hydromechanics Div.

4. Water Pressure Regulators:

a) Cashco, Inc.

b) Cla-Val Co.

c) Conbraco Industries, Inc.

d) FLOMATIC Corp.

e) Honeywell Braukmann.

f) IMI Cash Valve.

g) Spence Engineering Co., Inc.

h) Watts Industries, Inc.; Water Products Div.

i) Zurn Industries, Inc.; Wilkins Div.

2.02 BACKFLOW PREVENTERS

A. General: ASSE standard, backflow preventers, of size indicated for maximum flow rate and maximum pressure loss indicated.

1. 2-1/2-Inch NPS and Smaller: Bronze body with flanged ends.

2. Interior Components: Corrosion-resistant materials.

3. Exterior Finish: Polished chrome-plate if used in chrome-plated piping system.

B. Reduced-Pressure Backflow Assemblies: ASSE 1013, suitable for continuous pressure application. Include outside screw and yoke gate valves on inlet and outlet, and strainer on inlet; test cocks; and pressure-differential relief valve with ASME A112.1.2 air-gap fitting located between two positive-seating check valves.

2.03 STRainers

A. Strainers: Y-pattern, unless otherwise indicated, and full size of connecting piping. Include ASTM A 666, Type 304, stainless-steel screens with 3/64-inch round perforations, unless otherwise indicated.
2.04 HOSE BIBBS, P8

A. Hose Bibb Hydrants: ASME A112.21.3M or ASSE 1019, non-freeze, automatic draining, anti-backflow type, key operation, with 3/4-inch NPS threaded or solder-joint inlet, and ASME B1.20.7 garden-hose threads on outlet. Include operating key for each hydrant. Basis for design: Zurn Z-1300.

1. Type: Recessed.
2. Finish: Nickel bronze.

2.05 WATER PRESSURE REGULATORS

A. General: ASSE 1003, water regulators, rated for initial working pressure of 150 psig minimum, of size, flow rate, and inlet and outlet pressures indicated. Include integral factory-installed or separate field-installed Y-pattern strainer.

1. 2-Inch NPS and Smaller: Bronze body with threaded ends.
2. Interior Components: Corrosion-resistant materials.
3. Exterior Finish: Polished chrome-plate if used in chrome-plated piping system.

B. Single-seated, direct-operated type.

2.06 MISCELLANEOUS PIPING SPECIALTIES

A. Water Hammer Arresters: ASME A112.26.1M, ASSE 1010, or PDI-WH 201, bellows or piston type with pressurized cushioning chamber. Sizes are based on water-supply fixture units, ASME A112.26.1M sizes A through F and PDI-WH 201 sizes A through F.

B. Compressed Air Fittings: 5/8-inch water connection with standard air compressor quick disconnect fitting.

C. Fasteners: Metal compatible with material and substrate being fastened.

D. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

E. Solder: ASTM B 32, lead-free alloy.
F. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

G. Drain Valves: Hose end.

PART 3 EXECUTION

3.01 PLUMBING SPECIALTY INSTALLATION

A. General: Install plumbing specialty components, connections, and devices according to manufacturer's written instructions.

B. Install backflow preventers of type, size, and capacity indicated, at each water-supply connection to mechanical equipment and systems, and to other equipment and water systems as indicated. Comply with authorities having jurisdiction. Locate backflow preventers in same room as connected equipment. Install air-gap fitting on units with atmospheric-vent connection and pipe relief outlet drain to nearest floor drain. Do not install bypass around backflow preventer.

C. Install strainers on supply side of each control valve, pressure regulator, and solenoid valve, and where indicated.

D. Install pressure regulators with inlet and outlet shutoff valves and balance valve bypass. Install pressure gages on inlet and outlet.

E. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.

F. Fasten recessed, wall-mounting plumbing specialties to reinforcement built into walls.

G. Secure supplies to supports or substrate.

H. Install individual stop valve in each water supply to plumbing specialties. Use ball, gate, or globe valve if specific valve is not indicated.

I. Install water-supply stop valves in accessible locations.

J. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

K. Include wood-blocking reinforcement for recessed and wall-mounting plumbing specialties.

L. Include access for trap primers and water hammer arresters.

M. Install hose bibbs with integral or field installed vacuum breaker.
N. Install wall hydrants with integral or field installed vacuum breaker.

3.02 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

1. Install piping connections between plumbing specialties and piping specified in other Division 22 Sections.

2. Install piping connections indicated between appliances and equipment specified in other Sections; connect directly to plumbing piping systems.

B. Install hoses between plumbing specialties and appliances as required for connections.

C. Arrange for electric-power connections to plumbing specialties and devices that require power. Electric power is specified in Division 26 Sections.

D. Supply Runouts to Plumbing Specialties: Install hot- and cold-water-supply piping of sizes indicated, but not smaller than required by authorities having jurisdiction.

E. Ground electric-powered plumbing specialties.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

F. Arrange for electric-power connections to plumbing specialties and devices that require power. Electric power, wiring, and disconnect switches are specified in Division 26 Sections.

3.03 START-UP PROCEDURES

A. Before startup, perform the following checks:

1. System tests are complete.

2. Damaged and defective specialties and accessories have been replaced or repaired.

3. Clear space is provided for servicing specialties.

B. Before operating systems, perform the following steps:

1. Close drain valves, hydrants, and hose bibbs.

2. Open general-duty valves to fully open position.
3. Remove and clean strainers.

4. Verify that drainage and vent piping are clear of obstructions. Flush with water until clear.

C. Startup Procedures: Follow manufacturer's written instructions. If no procedures are prescribed by manufacturer, proceed as follows:

1. Energize circuits for electrically operated units. Start and run units through complete sequence of operations.

### 3.04 DEMONSTRATION

A. Startup Services: Engage a factory-authorized service representative to perform startup services and train Owner's maintenance personnel as specified below:

1. Train Owner's maintenance personnel on procedures and schedules related to startup of and servicing interceptors.

2. Train Owner's maintenance personnel on procedures and schedules related to startup of and servicing grease recovery units.

3. Review data in the maintenance manuals. Refer to Division 1 Section "Contract Closeout."

4. Schedule training with Owner with at least 7 days' advance notice.

### 3.05 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION
SECTION 22 13 16
SANITARY WASTE AND VENT PIPING

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes sanitary drainage and vent piping inside building and to locations indicated.

B. Related Sections include the following:

1. Division 33 – Utilities for sanitary sewage and storm drainage.
2. Division 31 – Earthwork for excavating, trenching, and backfilling.
3. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.
4. Division 22 Section "Sanitary Waste Piping Specialties" for drainage and vent piping system specialties.
5. Division 22 Section "Hangers and Supports for Plumbing Piping" for support installation and seismic restraints.
6. Division 22 Section "Plumbing Insulation".

1.02 DEFINITIONS

A. Service Entrance Piping: Drainage piping at entry into building between outside building sewer piping and inside drainage piping.

B. Soil, Waste, and Vent Piping: Piping inside building that conveys wastewater and vapors from fixtures and equipment throughout the building.

1.03 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:


1.04 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.
B. Test Results and Reports: Specified in "Field Quality Control" Article.

1.05 QUALITY ASSURANCE
A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.
B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

1.06 WARRANTY
A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 PIPING MATERIALS
A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.
B. Flexible Transition Couplings for Underground Nonpressure Piping: ASTM C 1173 with elastomeric sleeve. Include ends of same sizes as piping to be joined and include corrosion-resistant metal band on each end.

2.02 CAST-IRON SOIL PIPING
A. Hubless Pipe and Fittings: CISPI 301.
1. Couplings: Assembly of metal housing, corrosion-resistant fasteners, and ASTM C 564 rubber sleeve with integral, center pipe stop.
   a) Compact, Stainless-Steel Couplings: CISPI 310 with Type 301, or ASTM A 666, Type 301, stainless-steel corrugated shield; two stainless-steel bands; and sleeve.
   b) Heavy-Duty, Type 301, Stainless-Steel Couplings: Stainless-steel shield; stainless-steel bands; and sleeve.
      1) NPS 1-1/2 to NPS 4: 4 bands.

2.03 STEEL PIPING
A. Steel Pipe: ASTM A 53, Type E or S, Grade A or B, Schedule 40, galvanized. Include ends matching joining method.


PART 3 EXECUTION

3.01 EXCAVATION

A. Refer to Division 31 Section "Earthwork" for excavating, trenching, and backfilling.

3.02 PIPING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Aboveground, Soil, Waste, and Vent Piping: Use the following:
   1. Hubless, cast-iron soil pipe and fittings:
      a) Couplings: Compact, stainless steel, CISPI 310.

D. Underground, Soil, Waste, and Vent Piping: Use the following:
   1. Hubless, cast-iron soil pipe and fittings:
      a) Couplings: Heavy-duty, Type 304, stainless steel.

3.03 PIPING INSTALLATION, GENERAL

A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping installation.

3.04 SERVICE ENTRANCE PIPING INSTALLATION

A. Refer to Division 33 Section "Sanitary Sewer System" for sanitary piping.

B. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.

C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service entrance pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 22 Section "Common Work Results for Plumbing" for sleeves and mechanical sleeve seals.
3.05 DRAINAGE AND VENT PIPING INSTALLATION

A. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.

C. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:

1. All building drainage systems at 1/4 per foot downward in direction of flow.

2. Vent Piping: 1/8-inch per foot down toward vertical fixture vent.

D. Sleeves are not required for cast-iron soil piping passing through concrete slab on grade if slab is without membrane waterproofing.

3.06 JOINT CONSTRUCTION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.


3.07 HANGER AND SUPPORT INSTALLATION

A. Refer to Division 22 Section "Hangers and Supports for Plumbing Piping" for pipe hanger and support devices. Install the following:

1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.

2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet and less.

3. Adjustable roller hangers, MSS Type 43, for individual, straight, horizontal runs longer than 100 feet.

4. Spring cushion rolls, MSS Type 49, if indicated, for individual, straight, horizontal runs longer than 100 feet.

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5. Pipe rolls, MSS Type 44, for multiple, straight, horizontal runs 100 feet or longer. Support pipe rolls on trapeze.

6. Spring hangers, MSS Type 52, for supporting base of vertical runs.

B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping".

C. Support vertical piping and tubing at base and at each floor (15-ft. maximum).

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch minimum rods.

E. Install hangers for horizontal piping as scheduled in Division 22 Section "Hangers and Supports for Plumbing Piping."

F. Support vertical steel pipe and copper tube at each floor.

G. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.08 CONNECTIONS

A. Connect service entrance piping to exterior sewage and drainage piping. Use transition fitting to join dissimilar piping materials.

B. Connect drainage piping to service entrance piping, and extend to and connect to the following:

1. Plumbing Fixtures: Connect soil, waste, and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Plumbing Fixtures."

2. Plumbing Specialties: Connect soil, waste, and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Sanitary Waste Piping Specialties."

3.09 FIELD QUALITY CONTROL

A. Inspect soil, waste, and vent piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
a) Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

b) Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.

4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedure, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.

2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.

3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10 feet of head. Water level must not drop from 15 minutes before inspection starts through completion of inspection (24 hours). Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg. Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.

5. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.

6. Prepare reports for tests and required corrective action.
3.10 CLEANING AND PROTECTING

A. Clean interior of piping system. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY

A. This Section includes plumbing specialties for the following: Soil, waste, and vent systems.

B. Related Sections include the following:

1. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.

2. Division 22 Section "Sanitary Waste and Vent Piping" for drainage and vent piping and connections.

3. Division 22 Section "Hangers and Supports for Plumbing Piping" for pipe hangers and seismic restraints.

1.02  SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:

B. Soil, Waste, and Vent Piping: 10-foot head of water.

1.03  SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product Data: For each plumbing specialty indicated. Include rated capacities of selected equipment and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:

1. Trap seal primer valves.

2. Cleanouts.

3. Drains.

4. Miscellaneous piping specialties.
C. Reports: Specified in "Field Quality Control" Article.

D. Maintenance Data: For specialties to include in the maintenance manuals specified in Division 1. Include the following:

1. Trap seal primer valves.

1.04 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on plumbing specialties made to specified standards.

B. Listing and Labeling: Provide electrically operated plumbing specialties specified in this Section that are listed and labeled.

1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.

C. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.


1.05 DELIVERY, STORAGE, AND HANDLING

A. Use the following precautions during storage:

1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

1.06 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

1. Trap Seal Primer Valves:

   a) Josam Co.

   b) Precision Plumbing Products, Inc.

   c) Jay R. Smith Mfg. Co.

   d) Tyler Pipe; Wade Div.
2. Cleanouts:
   a) Josam Co.
   c) Tyler Pipe; Wade Div.
   e) Woodford Manufacturing Co.
   f) Zurn Industries, Inc.; Hydromechanics Div.

3. Drains:
   c) Zurn Industries, Inc.
   d) Tyler Pipe, Wade Div.
   e) Josam Co.

2.02 TRAP SEAL PRIMER VALVES

A. Trap Seal Primer Valves: ASSE 1018, water-supply-fed type, with the following characteristics:

1. 125-psig minimum working pressure.
2. Bronze body with atmospheric-vented drain chamber.
3. Inlet and Outlet Connections: 1/2-inch NPS threaded, union, or solder joint.
4. Gravity Drain Outlet Connection: 1/2-inch NPS threaded or solder joint.
5. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.
2.03 CLEANOUTS

A. General: Size cleanouts as indicated on drawings, or where not indicated, same size as connected drainage piping.

1. Provide wall cleanouts on each end of water closet ends and one over main drops in addition, provide all cleanouts required per code.

B. Cleanouts: ASME A112.2.36.2M, cast-iron body with straight threads and gasket seal or tapered threads for plug, flashing flange and clamping ring, and a brass closure plug. Cleanouts for installation in floors not having membrane waterproofing may be furnished without clamping ring.

1. Tiled Areas: Round cleanout top with tile recess top.
2. Walls: Round cleanout cover with stainless steel finish.
3. All Other Areas: Round cleanout top with nickel-bronze finish.

2.04 DRAINS

A. General: Size outlets as indicated on drawings.

B. Floor Drains: ASME A112.21.1M, cast-iron body, with seepage flange and clamping device, and trap seal primer valve connection. Floor drains for installation in floors not having membrane waterproofing may have seepage flange with clamping device. Floor drains for use as area drains in exterior slab on grade may be furnished with anchor flange instead of seepage flange and clamping device. Provide the following options as indicated:

1. Trap primer connection.
2. Round strainer with integral funnel.
3. Polished nickel bronze top.
4. Slotted top.

2.05 MISCELLANEOUS PIPING SPECIALTIES

A. Roof Flashing Assemblies: Manufactured assembly made of 4-lb/sq. ft., 0.0625-inch-thick, lead flashing collar and skirt extending at least 8 inches from pipe with galvanized steel boot reinforcement, and counterflash fitting.

B. Floor-Drain Inlet Fittings: Cast iron, with threaded inlet and threaded or spigot outlet, and trap seal primer valve connection.

C. Stack Flashing Fittings: Counterflash-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.

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D. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and set-screws to secure to vent pipe. Basis for design: Zurn Z193.

2.06 FLASHING MATERIALS

A. Copper Sheet: ASTM B 152, of the following minimum weights and thicknesses, unless otherwise indicated:
   1. General Applications: 12 oz./sq. ft..
   2. Vent Pipe Flashing: 8 oz./sq. ft..

B. Fasteners: Metal compatible with material and substrate being fastened.

C. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

D. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 EXECUTION

3.01 PLUMBING SPECIALTY INSTALLATION

A. General: Install plumbing specialty components, connections, and devices according to manufacturer's written instructions.

B. Install trap seal primer valves with valve outlet piping pitched down toward drain trap a minimum of one percent and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.

C. Install expansion joints on vertical risers, stacks, and conductors as indicated.

D. Install cleanouts in aboveground piping and building drain piping as indicated (the plans do not show all required cleanouts), and where not indicated, according to the following:
   1. Size same as drainage piping up to 4-inch NPS. Use 4-inch NPS for larger drainage piping unless larger cleanout is indicated.
   2. Locate at each change in direction of piping greater than 45 degrees.
   3. Locate at minimum intervals of 50 feet for piping 4-inch NPS and smaller and 100 feet for larger piping.
   4. Locate at base of each vertical soil and waste stack.

E. Install cleanout deck plates, of types indicated, with top flush with finished floor, for floor cleanouts for piping below floors.

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F. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.

G. Install flashing flange and clamping device with each stack and cleanout passing through floors with waterproof membrane.

H. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.

I. Install floor drains at low points of surface areas to be drained as indicated. Set grates of drains flush with finished floor or as indicated. Size outlets as indicated.

J. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.

K. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.

L. Position floor drains for easy access and maintenance.

M. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.

N. Fasten recessed, wall-mounting plumbing specialties to reinforcement built into walls.

O. Secure supplies to supports or substrate.

P. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.

Q. Locate drainage piping as close as possible to bottom of floor slab supporting fixtures and drains.

R. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

S. Include wood-blocking reinforcement for recessed and wall-mounting plumbing specialties.

T. Install cleanout plugs in p-traps to facilitate system drainage for winterizing facility.
3.02 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

1. Install piping connections between plumbing specialties and piping specified in other Division 22 Sections.

2. Install piping connections indicated between appliances and equipment specified in other Sections; connect directly to plumbing piping systems.

3. Install piping connections indicated as indirect wastes from appliances and equipment specified in other Sections, to spill over receptors connected to plumbing piping systems.

B. Install hoses between plumbing specialties and appliances as required for connections.

C. Drainage Runouts to Plumbing Specialties: Install drainage and vent piping, with approved trap, of sizes indicated, but not smaller than required by authorities having jurisdiction.

3.03 FLASHING INSTALLATION

A. Fabricate flashing manufactured from single piece unless large pans, sumps, or other drainage shapes are required.

B. Solder joints of copper sheets where required.

C. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.

1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.

2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.

3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.

D. Set flashing on floors and roofs in solid coating of bituminous cement.

E. Secure flashing into sleeve and specialty clamping ring or device.

F. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Section 07 62 00 "Sheet Metal Flashing and Trim."

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G. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.

H. Fabricate and install flashing and pans, sumps, and other drainage shapes as indicated. Install drain connection if indicated.

3.04 START-UP PROCEDURES

A. Before startup, perform the following checks:

1. System tests are complete.

2. Damaged and defective specialties and accessories have been replaced or repaired.

3. Clear space is provided for servicing specialties.

B. Before operating systems, perform the following steps:

1. Close drain valves, hydrants, and hose bibbs.

2. Open general-duty valves to fully open position.

3. Remove and clean strainers.

4. Verify that drainage and vent piping are clear of obstructions. Flush with water until clear.

3.05 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION
SECTION 22 33 00
ELECTRIC DOMESTIC WATER HEATERS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes the following for domestic water systems:

1. Commercial, electric water heaters.
2. Accessories.

1.02 RELATED DOCUMENTS

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

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.
2. Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty valves used as supply stops.
3. Division 22 Section "Domestic Water Piping Specialties" for specialties not specified in this Section.
4. Division 22 "Domestic Water Piping" for pipe and fittings.
5. Division 26 "Electrical" for wiring for electrical appurtenances.

1.03 SUBMITTALS

A. General: Submit each item in this Article according to Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product Data: For each type and size of water heater. Include rated capacities; shipping, installed, and operating weights; furnished specialties; and accessories.


C. Maintenance data for plumbing fixtures and components to include in the operation and maintenance manuals specified in Section 01 78 50.
1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain same type of water heaters through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. ASHRAE Standards: Comply with performance efficiencies prescribed for the following:


1.05 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1. Warranty Period: From date of Substantial Completion:

   a) Heating Elements: Five years.

   b) Storage Tanks: Ten years.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Use the following precautions during storage:

1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

1. Commercial, Storage, Electric Water Heaters:

   a) Bradford White Corp.

   b) Lochinvar Corp.

   c) PVI Industries, Inc.

e) Smith: A. O. Smith Water Products Co.

f) State Industries.

2. Expansion Tanks:

a) Amtrol, Inc.

b) Armstrong Pumps, Inc.

c) Taco, Inc.

d) Therma Flow, Inc.

e) Zurn Industries, Inc.; Wilkins Div.

f) Bell & Gossett.

2.02 COMMERCIAL, STORAGE, ELECTRIC WATER HEATERS

A. Description: Comply with UL 1453.

B. Storage Tank Construction: Non-ASME-code steel with 150-psi working-pressure rating.

1. Tappings: Factory fabricated of materials compatible with tank for piping connections, relief valve, pressure gage, thermometer, drain, anode rods, and controls as required. Attach tappings to tank shell before testing and labeling.

2. NPS 2 and Smaller: Threaded ends according to ASME B1.20.1, pipe threads.

3. Interior Finish: Materials and thicknesses complying with NSF 61, barrier materials for potable-water tank linings. Extend finish into and through tank fittings and outlets.

4. Insulation: Comply with ASHRAE 90.1. Surround entire storage tank except connections and controls.

5. Jacket: Steel, with enameled finish.

C. Heating Elements: Electric, screw-in or bolt-on, immersion type arranged in multiples of three.

D. Drain Valve: ASSE 1005, corrosion-resistant metal, factory installed.

E. Anode Rods: Factory installed, magnesium.
F. Dip Tube: Factory installed. Not required if cold-water inlet is near bottom of storage tank.

2.03 EXPANSION TANKS

A. Provide and install expansion tanks on WH-1, WH-2 and WH-3. Amtrol ST-12 or Amtrol ST-5 as detailed on contract documents or accepted equal.

2.04 WATER HEATER SUPPORT

A. Provide and install wall mounted support for WH-3. Support shall be pre-engineered to support scheduled water heater full of water. Support shall be galvanized sheet metal with 3/8-inch threaded rod. Pan shall have integral drainage fitting. Holdrite #30-SWHP-WM or accepted equal.

PART 3 EXECUTION

3.01 WATER HEATER INSTALLATION

A. Install water heaters, level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

B. Anchor water heaters to substrate.

C. Install wall mounted water heater supports in strict accordance with support manufacturer’s written instructions.

3.02 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Install piping adjacent to machine to allow service and maintenance.

C. Connect hot- and cold-water piping with shutoff valves and unions.

D. Make connections with dielectric fittings where piping is made of dissimilar metal.

E. Electrical Connections: Power wiring and disconnect switches are specified in Division 26 Sections. Arrange wiring to allow unit service.

F. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
3.03 FIELD QUALITY CONTROL

A. In addition to manufacturer's written installation and startup checks, perform the following:

1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment and retest until satisfactory results are achieved.

2. Verify that piping system tests are complete.

3. Check for piping connection leaks.

4. Check for clear relief valve inlets, outlets, and drain piping.

5. Energize electric circuits.

6. Adjust operating controls.

7. Adjust hot-water-outlet temperature settings. Do not set above 120 deg F unless piping system application requires higher temperature.

END OF SECTION
SECTION 22 40 00
PLUMBING FIXTURES

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes plumbing fixtures and trim, faucets, other fittings, and related components.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, basic installation requirements, and labeling and identifying requirements; and escutcheons, dielectric fittings, sleeves, and sleeve seals that are not in this Section.

2. Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty valves used as supply stops.

3. Division 22 Section "Domestic Water Piping Specialties" for backflow preventers and other specialties not specified in this Section.

4. Division 22 Section "Plumbing Insulation" for piping.

5. Division 22 Section "Sanitary Waste and Vent Piping" for pipe and fittings.

6. Division 22 "Domestic Water Piping" for pipe and fittings.

7. Division 26 "Electrical" for wiring for electrical appurtenances.

1.02 DEFINITIONS

A. Accessible: Plumbing fixture, building, facility, or portion thereof that can be approached, entered, and used by physically handicapped, disabled, and elderly people.

B. Fitting: Device that controls flow of water into or out of plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, showerheads and tub spouts, drains and tailpieces, traps and waste pipes. Pipe fittings, tube fittings, and general-duty valves are included where indicated.

1.03 SUBMITTALS

A. General: Submit each item in this Article according to Section 01 33 00, Shop Drawings, Product Data, and Samples.
B. Product Data for each plumbing fixture category and type specified. Include selected fixture, trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.

C. Wiring diagrams from manufacturer for electrically operated units.

D. Maintenance data for plumbing fixtures and components to include in the operation and maintenance manuals specified in Section 01 78 50.

1.04 QUALITY ASSURANCE

A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category from one source and by a single manufacturer.

1. Exception: Where fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for this category.


D. Backflow Prevention Requirements: Comply with the requirements of Washington State Department of Health regulation for "Backflow Prevention Assemblies Approved for Installation in Washington State".

E. Listing and Labeling: Provide electrically operated fixtures and components specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver plumbing fixtures in manufacturer's protective packing, crating, and covering.

B. Store plumbing fixtures on elevated platforms in dry location.
1.06 PLUMBING FIXTURE STANDARDS

A. Comply with applicable standards below and other requirements specified.

1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
5. Stainless-Steel Fixtures Other than Service Sinks: ASME A112.19.3M.
6. Vitreous-China Fixtures: ASME A112.19.2M.

B. Lavatory/faucet standards: Comply with ASME A112.18.1M and other requirements specified for lavatory, sink, and similar-type-fixture faucet fittings. Include hot- and cold-water indicators; and polished, chrome-plated finish; except where otherwise indicated. Coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.

3. Hose-Connection Vacuum Breakers: ASSE 1011.

C. Miscellaneous Fitting Standards: Comply with ASME A112.18.1M and other requirements specified for fittings, other than faucets. Include polished, chrome-plated finish, except where otherwise indicated. Coordinate fittings with other components and connectors.

3. Brass and Copper, Supplies and Tubular Brass: ASME A112.18.1M.

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D. Shower Faucet Standards

1. Comply with ASME A112.18.1M and other requirements specified for bathtub and shower faucet fittings. Include hot- and cold-water indicators; 2.5-gpm- maximum flow rate; and polished, chrome-plated finish; except where otherwise indicated. Coordinate faucet inlets with supplies and outlet with diverter valve; tub spout; and shower head, arm, and flange.

2. Combination, Pressure-Equalizing- and Thermostatic-Control, Antiscald Faucets: ASSE 1016.


8. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.

E. Miscellaneous Component Standards: Comply with applicable standards below and other requirements specified for components for plumbing fixtures, equipment, and appliances.


4. Supports: ASME A112.6.1M.


F. Fittings: Fittings for Equipment Specified in Other Sections: Fittings include the following:

1. Supply Inlets: Brass pipe or copper tube, size required for final connection.

2. Supply Stops: Chrome-plated brass, angle or straight; compression, loose-key type; same size as supply inlet and with outlet matching supply riser.

4. Traps: 0.045-inch thick tubular brass, slip-joint inlet, cleanout, wall flange, escutcheons, and size to match equipment. Use chrome-plated tube for exposed applications.

5. Continuous Waste: Tubular brass with slip-joint inlet, and size to match equipment.

6. Indirect Waste: Tubular brass size to match equipment.

1.07 PROJECT CONDITIONS

A. Field Measurements: Coordinate roughing-in and final fixture locations and verify that plumbing fixtures can be installed to comply with original design and referenced standards.

1.08 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 WATER CLOSET, P-1

A. 1.6 GPF, vitreous china, elongated front, siphon-jet type, wall hanging, back outlet with flushometer valve.

1. Products:

a) Kohler K4323 or equal by American Standard or Toto.

B. Toilet Seat: Elongated, solid plastic open front without cover with bumpers and hardware, Commercial, Heavy-Duty class.

1. Products:

a) Bemis 1655SSCT or equal by American Standard, Kohler or Toto.

C. Flushometer Valve: Concealed hydraulically activated water closet flushometer for wall hung concealed back spud bowls. ADA compliant non-hold-open feature type actuator; 1-inch I.P.S. wheel handle angle stop; adjustable tailpiece; vacuum breaker; double slip elbow flush connection and spud coupling for 1½-inch concealed back spud; sweat solder adapter; cast-brass body, brass or copper pipe or tubing inlet with wall flange and tailpiece. Polished, chrome-plated, exposed metal parts. 1.6 gal. maximum per flushing cycle.

1. Products:
a) Sloan Royal #952-1.6

D. Fixture Support: Vertically adjustable, cast-iron, water-closet carrier with combination support and waste fitting assemblies and tiling frame or setting gage. Include additional faceplate and coupling for water closet at wide pipe space. Provide extensions as required to accommodate wall thickness. As manufactured by Wade, Zurn or J.R. Smith.

2.02 WATER CLOSET, P-1A

A. 1.6 GPF, ADA compliant, vitreous china, elongated front, siphon-jet type, wall hanging, back outlet with flushometer valve.

1. Products:
   a) Kohler K4323 or equal by American Standard or Toto.

B. Toilet Seat: Elongated, solid plastic open front without cover with bumpers and hardware, Commercial, Heavy-Duty class.

1. Products:
   a) Bemis 1655SSCT or equal by American Standard, Kohler or Toto.

C. Flushometer Valve: Concealed hydraulically activated water closet flushometer for wall hung concealed back spud bowls. ADA compliant non-hold-open feature type actuator; 1-inch I.P.S. wheel handle angle stop; adjustable tailpiece; vacuum breaker; double slip elbow flush connection and spud coupling for 1½-inch concealed back spud; sweat solder adapter; cast-brass body, brass or copper pipe or tubing inlet with wall flange and tailpiece. Polished, chrome-plated, exposed metal parts. 1.6 gal. maximum per flushing cycle.

1. Products:
   a) Sloan Royal #952-1.6

D. Fixture Support: Vertically adjustable, cast-iron, water-closet carrier with combination support and waste fitting assemblies and tiling frame or setting gage. Include additional faceplate and coupling for water closet at wide pipe space. Provide extensions as required to accommodate wall thickness. As manufactured by Wade, Zurn or J.R. Smith.

2.03 WATER CLOSET, P-1B

A. 1.6 GPF, ADA compliant, floor mounted, elongated front, siphon-jet type, wall spud, floor outlet with flushometer valve.

1. Products:
   a) Acorn 2120-ADA
B. Toilet Seat: Elongated, solid plastic open front without cover with bumpers and hardware, Commercial, Heavy-Duty class.

1. Products:
   a) Bemis 1655SSCT or equal by American Standard, Kohler or Toto.

C. Flushometer Valve: Concealed hydraulically activated water closet flushometer for wall hung concealed back spud bowls. ADA compliant non-hold-open feature type actuator; 1-inch I.P.S. wheel handle angle stop; adjustable tailpiece; vacuum breaker; double slip elbow flush connection and spud coupling for 1½-inch concealed back spud; sweat solder adapter; cast-brass body, brass or copper pipe or tubing inlet with wall flange and tailpiece. Polished, chrome-plated, exposed metal parts. 1.6 gal. maximum per flushing cycle.

1. Products:
   a) Sloan Royal #952-1.6

2. Accessories:
   a) Provide one Chromalox screw-in heater unit #SCB 200 per water closet, and one Easy Heat capillary tube thermostat AWT per pipe alley, or approved equal.

2.04 URINAL, P-2

A. Low consumption 0.125 GPF, ADA compliant, vitreous china, wall hanging, back spud with flushometer valve.

1. Products:
   a) Kohler K-5452-ER-0 or approved equal by American Standard or Toto.

B. Flushometer Valve: Concealed hydraulically activated water closet flushometer for wall hung concealed back spud bowls. ADA compliant non-hold-open feature type actuator; 3/4-inch I.P.S. wheel handle angle stop; adjustable tailpiece; vacuum breaker; double slip elbow flush connection and spud coupling for 3/4-inch concealed back spud; sweat solder adapter; cast-brass body, brass or copper pipe or tubing inlet with wall flange and tailpiece. Polished, chrome-plated, exposed metal parts. 0.125 gal. maximum per flushing cycle.

1. Products:
   a) Sloan Royal #995-0.125

C. Fixture Support: Vertically adjustable, urinal chair carrier with coupling; steel-pipe upright members; bearing plate; and feet. Provide extensions as required to accommodate wall thickness. As manufactured by Wade, Zurn or J.R. Smith.

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2.05 COUNTERTOP LAVATORY, P-3

A. Vitreous china, drop-in lavatory, ADA Compliant, with 4-inch faucet center and extra hole for soap dispenser.

   1. Products:

      a) American Standard 0476.037 or approved equal by Kohler or Toto.

A. Faucets: Sink Faucet for hot and cold water, metering, deck-mounted with 4-inch fixed centers, chrome plated. Integral cast brass spout, 4-3/4-inch center-to-center. 0.5 GPM (1.9 L/min) vandal-proof, pressure compensating, non-aerating spray.

   1. Products:

      a) Chicago Faucet Model #: 3600-E2805AB or approved equal by Delta Commercial Faucets or T&S Brass.

B. Drain: Grid strainer with NPS 1-1/4 tailpiece.

C. Trap: cast-brass with slip-joint inlet and wall flange.

2.06 WALL HUNG LAVATORY, P-4

A. Stainless steel, wall hung lavatory, ADA Compliant, with 4-inch, two hole faucet center. Additional custom hole punch to be provided for soap dispenser (to be indicated in submittals).

   1. Products:

      a) Acorn 1953LC.

B. Faucets: Sink Faucet for hot and cold water, metering, deck-mounted with 4-inch fixed centers, chrome plated. Integral cast brass spout, 4-3/4-inch center-to-center. 0.5 GPM (1.9 L/min) vandal-proof, pressure compensating, non-aerating spray.

   1. Products:

      a) Chicago Faucet Model #: 3600-E2805AB or approved equal by Delta Commercial Faucets or T&S Brass.

C. Drain: Grid strainer with NPS 1-1/4 tailpiece.

D. Trap: cast-brass with slip-joint inlet and wall flange.

E. Fixture Support: Exposed arm; vertically adjustable, lavatory, chair carrier with steel-pipe upright members; and feet. Wade, Zurn or J.R. Smith.
2.07  **MOP SINK, P5**

A. Stainless steel floor mounted mop sink: 16-gauge construction, 19 x 16 x 12 inches.

   1. Products:

      a) Eagle Group F1916-12

      b) Approved equal by Elkay, Just or Kindred

B. Faucet: Widespread, cast brass, chrome plated, with supplies on 8-inch centers. Wall braced spout with integral vacuum breaker, pail hook, and hose-thread outlet.

   1. Products:

      a) Chicago 897-CP. Or approved equal by Delta Commercial Faucets or T&S Brass.

C. Drain: NPS 2 with grid strainer.

D. P-Trap: NPS 2 drainage piping.

E. Supplies: NPS 1/2 copper tubing with ball valve.

F. Mop Rack: Provide with 3-pole mop holder.

G. Reinforcement: Provide for wall-mounting faucet and wall brace.

2.08  **SINK, P-6**

A. Stainless Steel Sink: Self rimming, 18 gauge, single bowl with faucet ledge. 19" x 19" x 7" deep.

   1. Products:

      a) Sink: Elkay LR1919PD or approved equal by Kindred or Just.

      b) Faucet: Chicago Faucets1100-G2E3-317AB or equal by Delta Commercial Faucets or T&S Brass.

B. Drain: Grid strainer with NPS 1-1/2 tailpiece.

C. Trap: cast-brass with slip-joint inlet and wall flange.

2.09  **DRINKING FOUNTAIN/BOTTLE FILLER, P-7**

A. Stainless-steel, double bowl drinking fountain with bottle fill station, wall-hanging type, ADA compliant.
1. Products:
   a) Elkay LK4409BF: Bottle Filling Station Wall Mount, Bi-Level Non-Filtered Non-Refrigerated. Features shall include 316 Stainless, laminar flow, vandal resistant. Furnished with vandal resistant bubblers. Mechanical bottle filler button with mechanical front bubbler button activation. Product shall be wall mount (on wall), for outdoor applications, serving 3 station(s). Unit shall be lead-free design which is certified to NSF/ANSI 61 & 372 (lead free) and meets Federal and State low-lead requirements.
   
   b) Finish: Factory painted gray.
   
   c) Approved equal manufacturers: Acorn, Halsey Taylor, Haws, Sunroc.

2.10 SHOWER HEAD, P-9

A. Chrome-plated brass, vandal resistant shower head, cold water only.

1. Products:
   a) Shower head: Sloan Valve Company AC-460 or equal by Acorn, Chicago Faucet, Speakman.
   
   b) Shower faucet: Concealed straight valve, ½-inch inlet, ½-inch outlet, vandal proof metering push handle, adjustable cycle time metering cartridge, chrome plated solid brass construction. Chicago 770-665PSHCP or equal by Acorn, Sloan Valve Company or Speakman.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine roughing-in for potable, hot- and cold-water supply piping systems; soil, waste, and vent piping systems; and supports. Verify that locations and sizes of piping and locations and types of supports match those indicated, before installing and connecting fixtures. Use manufacturer's roughing-in data when roughing-in data are not indicated.

B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

A. Include supports for plumbing fixtures according to the following:
1. For wall hung water closets, urinals, lavatories, sinks, and drinking fountains where indicated.

2. Reinforcement: For floor-mounted lavatories and sinks that require securing to wall.

3. Fabricate reinforcement from 2-by-4-inch or 1/4-by-6-inch steel plates attached to studs, in wall construction, to secure fixtures to wall. Include length that will extend beyond ends of fixture mounting bracket and attach to at least 2 studs.

B. Include fitting insulation kits for accessible fixtures according to the following:

   1. Lavatories: Cover hot- and cold-water and tempered water supplies, stops and handles, drain, trap, and waste to wall.

   2. Sinks: Cover hot- and cold-water supplies, stops and handles, drain, trap, and waste to wall.

   3. Fixtures with Offset Drain: Cover hot- and cold-water supplies, offset drain, trap, and waste to wall.

   4. Other Fixtures: Cover exposed fittings below fixture.

3.03 PLUMBING FIXTURE INSTALLATION

A. Assemble plumbing fixtures and trim, fittings, faucets, and other components according to manufacturers' written instructions.

B. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.

C. Install floor-mounted, floor-outlet water closets with closet flanges and gasket seals.

D. Install wall-hanging, back-outlet water closets with support manufacturer's tiling frame or setting gage.

E. Install toilet seats on water closets.

F. Install wall-hanging, back-outlet urinals with gasket seals.

G. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for handicapped people to reach.

H. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated. Provide support arms as required to match wall thickness.
I. Fasten floor-mounted fixtures to substrate. Fasten fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.

J. Fasten recessed, wall-mounted fittings to reinforcement built into walls.

K. Fasten wall-mounted fittings to reinforcement built into walls.

L. Fasten counter-mounting plumbing fixtures to casework.

M. Secure supplies to supports or substrate within pipe space behind fixture.

N. Set mop basins in leveling bed of cement grout.

O. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.

P. Install water-supply stop valves in accessible locations.

Q. Install faucet, laminar-flow fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

R. Install supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

S. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

T. Install shower, flow-control fittings with specified maximum flow rates in shower arms.

U. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes, except where otherwise indicated.

V. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.

W. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant according to sealing requirements specified in Division 07 Section "Joint Sealers." Match sealant color to fixture color.

X. Coordinate exact location and mounting height of all fixtures with the architectural drawings.

Y. Provide cleanouts on p-traps to facilitate winterizing of facility.
3.04 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

1. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other Division 22 Sections.

B. Supply and Waste Connections to Plumbing Fixtures: Refer to plumbing fixture schedule on drawings for fitting sizes and connection requirements for each plumbing fixture.

C. Supply and Waste Connections to Equipment Specified in Other Sections: Connect equipment with supply inlets, supply stops, supply risers, and traps specified in this Section. Use fitting sizes required to match connected equipment. Connect fittings to plumbing piping.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

E. Arrange for electric-power connections to fixtures and devices that require power. Electric power is specified in Division 26 Sections.

3.05 FIELD QUALITY CONTROL

A. Verify that installed fixtures are categories and types specified for locations where installed.

B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized and demonstrate proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.06 ADJUSTING AND CLEANING

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Adjust water pressure at drinking fountains, faucets, shower valves, and flushometer valves having controls, to produce proper flow and stream.

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C. Replace washers and seals of leaking and dripping faucets and stops.

D. Clean fixtures, faucets, and other fittings with manufacturers’ recommended cleaning methods and materials. Include the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.

2. Remove sediment and debris from drains.

3.07 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of fixtures for temporary facilities, except when approved in writing by Owner.

END OF SECTION
PART 1 GENERAL

1.01 SUMMARY

A. Work includes the following: Provide materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of plumbing work for this project. Work includes motors, control equipment, support appurtenances, seismic restraint, identification, and balancing work.

1.02 DEFINITIONS AND ABBREVIATIONS

A. For definitions and abbreviations, refer to Division 01, General Conditions. Additional abbreviations are as follows:

1. F Fahrenheit
2. psi Pounds per square inch
3. psig Pounds per square inch gauge pressure
4. V Volts

B. Some of these abbreviations may not be used. All other abbreviations shall have the definition commonly associated with them by the trade or industry. Confirm the meaning of any unclear or unknown definitions with the Architect before proceeding with any work.

1.03 DRAWINGS AND SPECIFICATIONS

A. The Drawings are diagrammatic and do not show exact or complete ductwork and piping configurations or the necessary number and types of fittings. Provide labor and materials required to complete the work indicated.

1.04 LAW AND ORDINANCES

A. General:

1. Mechanical work specified under this Contract shall be in strict accordance with the latest rules and regulations of applicable codes.

2. Furnish and install work shown or specified which may be beyond requirements of ordinances, laws, regulations, and codes. This work shall be included within the construction Contract.
B. Approval: File necessary plans, prepare documents and obtain necessary approval of governmental departments having jurisdiction and required certificates of inspection for work and deliver same to Owner in accordance with General Conditions 01 41 00.

C. Permits, Certificates and Taxes: Procure and pay for the necessary permits, certificates, and taxes for work as required in the General Conditions. In addition, perform ordinance and performance tests in the presence of the Architect, and be responsible for advance notification. Submit copies of signed and approved permits to the architect.

1.05 MATERIAL REVIEW, SUBMITTALS AND SHOP DRAWINGS

A. General: Deliver material, submittal and shop drawing data in accordance with the requirements of Division 01.

B. Standards Compliance and Certification: Where equipment or materials are specified to conform with requirements of standards of recognized technical or industrial organizations such as American National Standards Institute (ANSI), American Society for Mechanical Engineers (ASME), Underwriters Laboratories Refrigeration Institute (ARI), or National Electrical Manufacturer's Association (NEMA), that use a label or published listing as a method of indicating compliance, proof of such conformance shall be submitted and approved.

C. Substitution of Materials: See Section 013300, Shop Drawings, Product Data, and Samples.

1.06 SINGLE SOURCE RESPONSIBILITY

A. Single-Source Responsibility: Comply with the requirements specified in Division 1 Section "Product Requirements".

1.07 SAFETY AND PROTECTION

A. Drive Guards: Provide OSHA-approved drive and shaft guards for exposed, rotating shafts and drive connections between motors and driven equipment. Include steel frames securely fastened for easy removal to the equipment frame. Provide tachometer cut-out at shafts where applicable.

B. Head Protection: Where pipe hangers, equipment support angles, and the like, are exposed in walkways, or in access ways for any maintenance, cover such potentially injurious protrusions less than 7’ 2” above the floor with padding made up of closed cell type insulation; secure and permanently fasten, and finish to match adjacent finishes.

1.08 TESTING AND DEMONSTRATION

A. Demonstrate that equipment operates as indicated and in accordance with manufacturer's recommendations. Perform tests in the presence of the Architect.
and Owner; give minimum one-week notice prior to test. Provide instruments and personnel required to conduct the tests.

1.09 OPERATIONS AND MAINTENANCE MANUALS

A. Furnish operations and maintenance (O&M) manuals in accordance with Division 01.

B. O & M manuals shall include full descriptions of systems and products installed under this contract. Furnish complete narrative descriptions, product and originals of equipment descriptions with exploded diagrams, parts lists including part numbers, disassembly and assembly instructions and control wiring diagrams.

1.10 RECORD DOCUMENTS

A. Refer to the requirements of Division 01.

1.11 INSTRUCTION PERIODS FOR OWNER'S PERSONNEL

A. Description: Following installation of mechanical equipment and prior to acceptance of the mechanical work, conduct demonstrations and instruction periods to point out locations of servicing points and required points of maintenance to Owner's representative. Refer also to the requirements of Division 01.

B. General Description of Instruction Periods: Include preliminary discussion and presentation of information from maintenance manuals, with appropriate references to Contract Documents, followed by tour of systems explaining maintenance requirements, access methods, servicing and maintenance procedures, equipment cleaning procedures, control settings and available adjustments.

PART 2 PRODUCTS

2.01 GENERAL

A. Comply with "Quality Assurance" provisions, Specifications, and Manufacturers' Data. Where these may be in conflict, the more stringent requirements govern.

2.02 ELECTRICAL ENCLOSURES

A. Electrical equipment shall be contained in an enclosure suitable for the environment where mounted. Enclosures shall be NEMA 3R where exposed to the weather. Other enclosures shall be per code or as noted.

2.03 EXPANSION SHELLS AND BOLTS

A. Expansion Shells for Rod Hangers: Phillips, Gregory, Omark, or Fastite in holes drilled in concrete.
B. Expansion Bolts for Equipment: USM or McCullough in holes drilled in concrete.

2.04 FORMED STEEL CHANNELS AT SLAB

A. Provide for equipment; number and size per manufacturer's recommendations or as indicated.

2.05 ANCHOR BOLTS

A. Provide for equipment; number and size per manufacturers' recommendations or as indicated.

2.06 SUPPLEMENTARY STEEL FRAMING

A. Standard structural steel shapes or Schedule 40 steel pipe, galvanized with extra-heavy finish.

2.07 SLEEVES

A. Materials, General: Schedule 40 galvanized steel pipe with unthreaded ends, or standard structural steel shapes.

B. Fireproofing: Three-hour rated penetration sealing system per UL 1479 and ASTM E-814; 3M Fire Barrier, Dow Chemical RTV, Manville Cerafiber, or equal.

2.08 WELDING TO BUILDING STRUCTURAL MEMBERS

A. Not allowed except as indicated.

2.09 NAMEPLATES

A. Laminated black plastic with lettering cut through to white background. Plastic strips with raised letters made by a marking device are not acceptable.

2.10 PAINTING

A. Paint exposed fixtures and equipment. Coordinate color with Architect. Refer to Sections 09 90 00 for paint and application requirements.

2.11 UNDERWRITERS' LABORATORY, INC. (UL) LISTED EQUIPMENT

A. Whenever UL Standards exist for equipment with electrical components, provide UL-approved equipment bearing the UL label. Otherwise provide equipment certified in writing by the manufacturer as complying with UL Standards for similar items to the satisfaction of the governing agencies.
PART 3 EXECUTION

3.01 INSPECTION
   A. Verify installation conditions as satisfactory to receive work of this Section. Do not install until any unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.02 PREPARATION
   A. Field Measurements: Field-verify locations of new and existing work prior to commencing work of this Section.
   B. Protect surrounding areas and surfaces to preclude damage from work of this Section.

3.03 INSTALLATION, APPLICATION, ERECTION, AND PERFORMANCE
   A. Install, apply, erect, and perform the work in accordance with "Quality Assurance" provisions, Specifications, and manufacturers' installation instructions and directions. Where these may be in conflict, the more-stringent requirements govern.

3.04 CLEANING
   A. Promptly remove waste material and rubbish caused by mechanical construction work. At completion of the project, clean equipment and ductwork installed or provided under this Contract.

3.05 CUTTING AND PATCHING
   A. Cut openings and holes required for mechanical work. Carefully examine existing conditions prior to commencing work. Refer to Section 01 71 29.

3.06 ACCESSIBILITY
   A. Locate dampers, controls, and the like, to be easily accessible.
   B. Install equipment which requires periodic servicing or repairs to be readily accessible. Otherwise, obtain Engineers approval of location.
   C. Provide access panels as indicated or required for piping, valve or equipment access. Refer to Architectural Documents to determine fire rating requirements. Minimum access panel size shall be 12 inch x 12 inch.

3.07 SPECIAL PROTECTION
   A. Exercise maximum precaution to provide positive protection for the existing building and equipment from damage of any kind and prevent any water and dust seepage into the existing building.
B. Storage of materials: Make necessary provisions to prevent damage or corrosion of materials.

3.08 EQUIPMENT INSTALLATION

A. General: Provide supports for equipment and appurtenances as required, including braces as required for seismic restraint; these include frames or supports for pumps and air handlers and mechanical equipment. Bracing shall conform with the requirements of IBC and IMC. Provide Sizing and installation of these members.

B. Suspended Equipment: Provide hangers from structure as required; span between structural members with additional structural steel as required to mount equipment in locations shown. Provide sizing and installation of these members. Do not fasten hangers to metal deck. Do not use powder actuated fasteners.

3.09 PIPE SUPPORTS

A. Attach hangers and support rigidly to the building structure; provide supplementary steel framing and bracing at changes in pipe direction to resist thrust of flowing water. Provide seismic bracing as required by codes. Do not fasten hangers to metal deck. Do not use powder-actuated fasteners.

3.10 EXPANSION SHELLS AND BOLTS

A. Use only where necessary to support piping or equipment from existing concrete slabs or walls.

3.11 SLEEVES AND SEALING OF SLEEVES

A. Provide sleeving and sealing of sleeves for ducts.

B. Provide annular clear space of approximately 1/4" to 1/2"; size to accommodate insulation passing through sleeve where applicable.

3.12 NAMEPLATES

A. Provide for equipment; fasten mechanically.

3.13 PAINTING

A. Refer to Division 09 90 00 – Painting.

3.14 MISCELLANEOUS EQUIPMENT AND FIXTURE CONNECTIONS

A. Perform on-site review and refer to manufacturers' shop drawings for details of connections. Provide rough-in at locations to conveniently serve items.
3.15  BALANCING WORK

A. General: Provide balancing and testing work; work shall be performed hereunder. Coordinate with Section 23 05 93.

B. Work by Mechanical Contractor:

1. Operate the mechanical systems and be responsible for equipment until the balancing and testing is complete. Before balancing and testing commences, check rotating equipment for proper rotation and lubricate per the manufacturers' recommendations.

2. Before balancing and testing commences, operate pumps and auxiliary equipment for a minimum of one hour. During this period, check out and calibrate control components under operating service.

C. Work Coordinated with Owner: Perform balancing and testing in accordance with AABC or NEBB standard publications and standard industry practice.

3.16  WIRING

A. Wiring shall conform to applicable sections of these specifications. Provide wiring from branch circuit overcurrent device to motor controller to motor terminals, including installation of starter and connections. Provide raceway and conductors as shown for remote control, or interlock connections. Coordinate other control wiring with Division 23 of the Specifications. Provide overload elements in controllers sized to match motor nameplate full load amperes. Space within controllers shall not be used as a junction box.

END OF SECTION
SECTION 23 05 93  
TESTING, ADJUSTING, AND BALANCING FOR HEATING AND VENTILATION

PART 1  GENERAL

1.01  SUMMARY

A. This Section includes testing, adjusting, and balancing heating and ventilation systems to produce design objectives, including the following:

1. Balancing airflow within distribution systems to indicated quantities according to specified tolerances.
2. Adjusting total heating and ventilation systems to provide indicated quantities.
4. Setting quantitative performance of heating and ventilation equipment.
5. Verifying that automatic control devices are functioning properly.
6. Reporting results of the activities and procedures specified in this Section.

B. Related Sections include the following:

1. Testing and adjusting requirements unique to particular systems and equipment are included in the Sections that specify those systems and equipment.
2. Field quality-control testing to verify that workmanship quality for system and equipment installation is specified in system and equipment Sections.

1.02  DEFINITIONS

A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to modify fan speed or adjust a damper.

B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.

C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person’s skin than is normally dissipated.

D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

E. Report Forms: Test data sheets for recording test data in logical order.
F. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

G. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.

H. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

I. Test: A procedure to determine quantitative performance of a system or equipment.

J. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.


M. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

N. TAB: Testing, Balancing, and Adjusting.

1.03 SUBMITTALS

A. Quality-Assurance Submittals: Submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.

B. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.

C. Warranty: Submit 2 copies of special warranty specified in the "Warranty" Article below.

D. Balancing Report:

1. Submit completed Balancing Report as indicated, including the following:
   a) System Diagrams/Floor Plans.
   b) Air Apparatus Test Reports.
   c) Electric Heater Test Reports.
   d) Fan Test Reports.
e) Air Outlet Test Reports.

f) Instrument Calibration Report.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:

1. Comply with all applicable city, county, and state codes and ordinances. In case of conflict with Drawings or Specifications, the codes and ordinances govern.

2. Basis:

   
   b) International Mechanical Code.
   
   c) NFPA-90A.

B. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by NEBB, not affiliated with mechanical contractor. Certified agent shall be a full-time employee of the TAB contractor.

C. Experience: Minimum 5 years on projects of similar scope and complexity.

D. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:

1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.

2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.


F. Instrumentation Type, Quantity, and Accuracy: As described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."

G. Instrumentation Calibration: Calibrate instruments as required by NEBB certification or more frequently if required by the instrument manufacturer.
1.05 PROJECT CONDITIONS

  A. Partial Owner Occupancy: The Owner may occupy completed areas of the building before Substantial Completion. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations.

1.06 COORDINATION

  A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, heating and ventilation controls installers, and other mechanics to operate heating and ventilation systems and equipment to support and assist testing, adjusting, and balancing activities.

  B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.

  C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.07 WARRANTY

  A. General Warranty: The special performance guarantee specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

  B. Special Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:

    1. The certified Agent has tested and balanced systems according to the Contract Documents.

    2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 HEATING AND VENTILATION PRODUCTS

2.01 GENERAL

  A. Comply with "Quality Assurance" provisions, specifications, and manufacturer's data. Where these may be in conflict, the more stringent requirements govern.

2.02 TAB INSTRUMENTATION

  A. Furnish materials and equipment necessary to properly measure system capacities, electrical voltage and current, fan speeds, static pressures, air
velocities, water pressure drops, refrigeration pressures, and other readings necessary to evaluate system performance and adjust quantities to those indicated. TAB Contractor retains possession of materials and equipment after project is completed.

B. Instrumentation shall be accurate, with calibration histories available for examination upon request.

C. Instrumentation shall be used in accordance with manufacturer instructions.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify installation conditions as satisfactory to receive work of this Section. Do not begin work until any unsatisfactory conditions are corrected.

3.02 EXAMINATION

A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.

1. Verify that balancing devices, such as test ports and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of heating and ventilation systems and equipment.

C. Examine project record documents described in Section 01 78 90, “Project Record Documents”.

D. Examine equipment performance data, including fan curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

E. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.

F. Examine system and equipment test reports.

G. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

H. Examine air-handling equipment to ensure equipment with functioning controls is ready for operation.
I. Examine equipment for installation and for properly operating safety interlocks and controls.

J. Examine automatic temperature system components to verify the following:

1. Thermostats are located to avoid adverse effects of sunlight, drafts, and cold walls.

2. Sensors are located to sense only the intended conditions.

3. Sequence of operation for control modes is according to the Contract Documents.

4. Controller set points are set at design values. Observe and record system reactions to changes in conditions. Record default set points if different from design values.

K. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.03 PREPARATION

A. Field verify locations of new and existing work prior to commencing work of this Section.

B. Protect surrounding areas and surfaces to preclude damage from work of this Section.

C. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.

D. Complete system readiness checks and prepare system readiness reports. Verify the following:

1. Permanent electrical power wiring is complete.

2. Automatic temperature-control systems are operational.

3. Equipment and duct access doors are securely closed.


5. Windows and doors can be closed so design conditions for system operations can be met.

3.04 GENERAL TESTING AND BALANCING PROCEDURES

A. Perform testing and balancing procedures on each system according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
B. Cut insulation, ducts, for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.

C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

D. Ensure volume damper locking mechanisms are tightened down in the balanced position.

3.05 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

D. Verify that motor starters are equipped with properly sized thermal protection.

E. Check dampers for proper position to achieve desired airflow path.

F. Check for airflow blockages.

3.06 TOLERANCES

A. Set heating and ventilation system airflow rates within the following tolerances:

1. Exhaust Fans: Plus 5 to plus 10 percent.

2. Air Inlets: 0 to minus 10 percent.

3.07 FINAL REPORT

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.

B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.

1. Include a list of the instruments used for procedures, along with proof of calibration.
C. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:

1. Title page.
2. Name and address of testing, adjusting, and balancing Agent.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
9. Signature of testing, adjusting, and balancing Agent who certifies the report.
10. Summary of contents, including the following:
    a) Design versus final performance.
    b) Notable characteristics of systems.
    c) Description of system operation sequence if it varies from the Contract Documents.
11. Nomenclature sheets for each item of equipment.
12. Data for terminal units, including manufacturer, type size, and fittings.
13. Notes to explain why certain final data in the body of reports vary from design values.
    a) Test conditions for fans performance forms.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present with single-line diagrams and include the following:

1. Quantities of exhaust airflows.
2. Duct, outlet, and inlet sizes.

E. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data: Include the following:
a) System identification.
b) Location.
c) Make and type.
d) Model number and size.
e) Manufacturer's serial number.

2. Motor Data: Include the following:
   a) Horsepower and rpm.
   b) Volts, phase, and hertz.

3. Test Data: Include design and actual values for the following:
   a) Total airflow rate in cfm.
   b) Total system static pressure in inches wg.
   c) Fan rpm.
   d) Discharge static pressure in inches wg.
   e) Suction static pressure in inches wg.

END OF SECTION
PART 1  GENERAL

1.01  SUMMARY

A. This Section includes labor, materials, tools, equipment, and services for mechanical systems as indicated or required to provide a complete, functional and operable temperature control system.

B. Related Sections include the following:

1. Division 23 Section “Common Work Results for Heating and Ventilation.”

1.02  DESCRIPTION

A. Furnish labor, materials, tools, equipment, and services for mechanical systems as indicated or required to provide a complete, functional and operable temperature control system. Provide specified and necessary instrumentation and temperature controls for heating, ventilation, and exhaust systems.

B. Coordinate electrical requirements with Division 26 and the Electrical Contractor.

C. It is the responsibility of the control subcontractor to read and conform to all sections of the specification, to coordinate equipment supplied by others with his work, to provide control equipment as specified in other sections of this document and to install equipment which be supplied by others.


E. Provide a complete solid-state electronic system of automatic temperature controls.

1.03  SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Provide control submittal with the balance of the mechanical submittals.

C. Provide submittals to include control components, control diagrams and operational sequences.

1.04  QUALITY ASSURANCE

A. Single-Source Responsibility: Comply with the requirements specified in Division 1 Section "Product Requirements".

09/30/19
1.05 MANUFACTURER
A. As manufactured by Johnson Controls, Honeywell, Barber Colman, Landis & Gyr Powers unless noted otherwise.

1.06 WARRANTY
A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 SPACE THERMOSTATS
A. Unit Heater Thermostats
   1. Specified in Division 23 Section, “Electric Heaters”.
   2. Locate where indicated by the Contract Documents, 4’-6” above the finished floor.

2.02 CONTROL PANELS
A. Panels shall be UL listed enclosures and assemblies. Provide the enclosure with the appropriate NEMA rating for the application. Panels shall be manufactured of furniture grade steel with a baked prime coat enamel finish. The panel doors shall be hinged locking type. Control panels shall contain switches, pilot lights, terminal blocks, and other accessories as required for an operational temperature control system. Components within the control panels shall be prewired to numbered terminal strips, ready for field connection to field-mounted control components.

2.03 ELECTRONIC TIMERS
A. Electronic timer switch for exhaust fans provided by Division 26; refer to Electrical Plans.

2.04 RELAYS, TRANSFORMERS, MISC.
A. Of type and duty rating required to implement specified hardware and sequences.

PART 3 EXECUTION

3.01 GENERAL
A. Connect control devices to perform functions indicated and perform in required sequence.
3.02 ELECTRIC WIRING

A. Wiring required by the temperature control system is by the Control Contractor. Furnish wiring in accordance with applicable national, state and local codes and Division 26.

B. Run control wiring in separate conduit from power wiring.

3.03 THERMOSTATS AND CONTROLLERS

A. Located where indicated by the contract documents, 4'-6" above the finished floor.

3.04 SEQUENCE OF OPERATION

A. Heating and ventilation control sequences: See Drawings.

END OF SECTION
SECTION 23 31 13
METAL DUCTS

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes rectangular and round metal ducts and plenums for heating, ventilating, and air-conditioning systems in pressure classes from minus 2- to plus 10-inch wg.

B. Related Sections include the following:

1. Division 23 Section "Air Duct Accessories" for dampers, control devices, duct-mounted access doors and panels, turning vanes, and flexible ducts.

2. Division 23 Section "Testing, Adjusting, and Balancing" for air balancing and final adjusting of manual-volume dampers.

1.02 DEFINITIONS

A. Thermal Conductivity and Apparent Thermal Conductivity (k-Value): As defined in ASTM C 168. In this Section, these values are the result of the formula Btu x in./h x sq. ft. x deg F at the temperature differences specified. Values are expressed as Btu.

1.03 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product Data: For duct liner and sealing materials.

C. Field Test Reports: Indicate and interpret test results for compliance with performance requirements.

D. Record Drawings: Indicate actual routing, fitting details, reinforcement, support, and installed accessories and devices. Provide record drawings in accordance with Section 01 78 90 Project Record Documents.

1.04 QUALITY ASSURANCE

A. Comply with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems," unless otherwise indicated.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver sealant materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration
period for use, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle sealant materials according to manufacturer's written recommendations.

C. Deliver and store stainless-steel sheets with mill-applied adhesive protective paper maintained through fabrication and installation.

1.06 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 SHEET METAL MATERIALS

A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.

B. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.02 SEALANT MATERIALS

A. Joint and Seam Sealants, General: The term "sealant" is not limited to materials of adhesive or mastic nature but includes tapes and combinations of open-weave fabric strips and mastics.


2. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and a modified acrylic/silicone activator to react exothermically with tape to form a hard, durable, airtight seal.

3. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant, formulated with a minimum of 75 percent solids.

4. Flanged Joint Mastics: One-part, acid-curing, silicone, elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.
2.03 HANGERS, SUPPORTS AND RESTRAINTS

A. Building Attachments: Concrete inserts, mechanical-anchor fasteners, or structural-steel fasteners appropriate for building materials. Powder actuated concrete fasteners are not allowed.

1. If concrete inserts cannot be used, install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer’s written instructions. Concrete inserts and mechanical-anchor fasteners shall be made of steel.

2. Expanding concrete anchors shall be made of steel.

B. Hanger Materials: Galvanized, sheet steel or round, threaded steel rod.

1. Hangers Installed in Corrosive Atmospheres: Electrogalvanized, all-thread rod or galvanized rods with threads painted after installation.

2. Straps and Rod Sizes: Comply with SMACNA "HVAC Duct Construction Standards--Metal and Flexible" for sheet steel width and thickness and for steel rod diameters.

C. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

2.04 DUCT PRESSURE CLASSIFICATIONS

A. Rectangular Duct Static-Pressure Classifications: Construct ducts to the following:

1. Exhaust Ducts: 2-inch wg, negative pressure.

B. Round Duct Static Pressure Classifications: Construct ducts to the following:

1. Exhaust Ducts: 2-inch wg, negative pressure.

2.05 RECTANGULAR DUCT FABRICATION

A. General: Fabricate ducts, elbows, transitions, offsets, branch connections, and other construction with galvanized, sheet steel, according to SMACNA "HVAC Duct Construction Standards--Metal and Flexible", unless indicated otherwise. Comply with requirements for metal thickness, reinforcing types and intervals, tie-rod applications, and joint types and intervals.

1. Lengths: Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.

2. Materials: Free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.
3. Branch Connections:

   a) Round Branch: Use conical or bell mouth connections.

   b) Rectangular Branch: Use 45° entry.

B. Material Thickness: For SMACNA "HVAC Duct Construction Standard – Metal and Flexible", but not less than 26 gauge.

2.06 ROUND DUCT FABRICATION

A. Round Ducts: Fabricate supply ducts of galvanized steel according to SMACNA "HVAC Duct Construction Standards--Metal and Flexible", unless indicated otherwise.

2.07 ROUND SUPPLY AND EXHAUST FITTING FABRICATION

A. 90-Degree Tee Fittings and Taps: Fabricate to comply with SMACNA "HVAC Duct Construction Standards--Metal and Flexible," with metal thicknesses specified for longitudinal seam straight duct. Use 90-degree conical tee fitting where diameter of branch duct is greater than two-thirds the diameter of the main duct or if branch duct diameter is greater than 12-inches. 90-degree conical taps or 90-degree conical tee fittings can be used for all others. Saddle taps not allowed.

   1. Use 45-degree lateral and 45-degree elbow in lieu of 90-degree tee fitting or tap on supply ductwork where space allows.

B. 45-Degree Lateral Fittings and Taps: Use 45-degree Lateral Fitting where diameter of branch duct is greater than two-thirds the diameter of the main or if branch duct diameter is greater than 12-inches. 45-degree lateral taps or 45-degree lateral fittings can be used for all others. Saddle taps not allowed.

C. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from body onto branch tap entrance.

D. Elbows: Fabricate in die-formed, gored, pleated, or mitered construction. Fabricate bend radius of die-formed, gored, and pleated elbows one and one-half times elbow diameter. Unless elbow construction type is indicated, fabricate elbows as follows:

   1. Gored-Elbow Number of Pieces: Welded construction.

      a) 90 degree elbow: 5 gores.

      b) 60 degree elbow: 4 gores.

      c) 45 degree elbow: 3 gores.
2. Round Elbows: Welded construction with the following metal thickness for pressure classes from minus 2- to plus 2-inch wg, unless specifically indicated otherwise:
   a) Ducts 3 to 26 Inches in Diameter: 24-gauge.

3. Round Elbows: Welded construction with the following metal thickness for pressure classes from 2- to 10-inch wg, unless specifically indicated otherwise:
   a) Ducts 3 to 14 Inches in Diameter: 24-gauge.

4. 90-Degree, Two-Piece, Mitered Elbows: Use only where specifically indicated. Fabricate with single-thickness turning vanes.

5. Round Elbows, 8 Inches and Smaller: Fabricate die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Die formed elbows shall be 20 gauge thick minimum with two-piece welded construction. Fabricate nonstandard bend-angle configuration or nonstandard diameter elbows with gored construction.

6. Round Elbows, Larger Than 8 through 14 Inches: Fabricate gored or pleated elbows for 30, 45, 60, and 90 degrees. Fabricate nonstandard bend-angle configuration or nonstandard diameter elbows with gored construction.

PART 3 EXECUTION

3.01 DUCT INSTALLATION, GENERAL

A. Duct installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts, fittings, and accessories.

B. Construct and install each duct system for the specific duct pressure classification indicated.

C. Install round ducts in lengths not less than 12 feet, unless interrupted by fittings.

D. Install ducts with fewest possible joints.

E. Install fabricated fittings for changes in directions, changes in size and shape, and connections.

F. Install couplings tight to duct wall surface with a minimum of projections into duct.

G. Install ducts, unless otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs.

H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

09/30/19
I. Install ducts with a clearance of 1 inch.

J. Conceal ducts from view in finished spaces. Do not encase horizontal runs in solid partitions, unless specifically indicated.

K. Coordinate layout with lighting layouts, and similar finished work. Allow for post-construction access to volume dampers, and other components requiring maintenance and/or readjustment.

L. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures, unless ductwork is intended to serve these spaces.

M. Non-Fire-Rated Partition Penetrations: Where ducts pass through interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same metal thickness as duct. Overlap opening on four sides by at least 1-1/2 inches.

3.02 SEAM AND JOINT SEALING

A. General: Seal duct seams and joints according to the duct seal class described in SMACNA "HVAC Duct Construction Standards--Metal and Flexible" corresponding to the pressure class given below.

B. Pressure Classification:
   1. Below 3-inch wg: Seal Class B; all transverse; joints and longitudinal seams.

C. Seal externally insulated ducts before insulation installation.

3.03 HANGING, RESTRAINING, AND SUPPORTING

A. Install rigid round, rectangular, and flat-oval metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards--Metal and Flexible."

B. Install duct seismic restraints as indicated in SMACNA "Seismic Restraint Manual Guidelines for Mechanical Systems."

C. Support horizontal ducts within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Install upper attachments to structures with an allowable load not exceeding one-fourth of failure (proof-test) load.

E. Install concrete inserts before placing concrete.

F. Install mechanical-anchor fasteners after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
3.04 CONNECTIONS

A. Unless indicated otherwise, connect equipment with flexible connectors according to Division 23 Section "Air Duct Accessories."

B. For branch, outlet and inlet, and terminal unit connections, comply with SMACNA "HVAC Duct Construction Standards--Metal and Flexible", unless indicated otherwise.

3.05 ADJUSTING

A. Refer to Division 23 Section "Testing, Adjusting, and Balancing" for detailed procedures.

3.06 CLEANING

A. After completing system installation, including outlet fittings and devices, inspect the system. Vacuum ducts, and where possible, wipe ducts with moist cloth before final acceptance to remove dust and debris.

END OF SECTION
SECTION 23 33 00
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes the following:
   1. Control dampers.
   2. Control damper actuators.
   4. Flexible connectors.
   5. Grilles
   6. Duct accessory hardware.

B. Related Sections include the following:
   1. Division 08 Section 08 91 00 "Louvers" for intake louver and vents installed in exterior walls.
   2. Division 23 Section "Metal Ducts" for ductwork, duct liner and duct sealants.

1.02 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product Data: For the following:
   1. Control dampers.
   2. Control damper actuators.

C. Product Certificates: Submit certified test data on dynamic insertion loss; self-noise power levels; and airflow performance data, static-pressure loss, dimensions, and weights.
1.03 QUALITY ASSURANCE

A. NFPA Compliance: Comply with the following NFPA standards:
   1. NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

1.04 DELIVERY, STORAGE, AND HANDLING

A. Use the following precautions during storage:
   1. Store indoors. If outdoor storage is necessary, store off the ground in watertight enclosures.

1.05 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Control Dampers:
      a) Ruskin.
      b) American Warming & Ventilating.
      c) Greenheck.
   2. Control Damper Actuators:
      a) Honeywell.
      b) Belimo.
      c) Johnson Controls.
   3. Grilles:
      a) Titus.
      b) Kreuger.
      c) Price.
      d) Greenheck

09/30/19
2.02 SHEET METAL MATERIALS

A. Galvanized, Sheet Steel: Lock-forming quality; ASTM A 653/A 653M, G90 coating designation; mill-phosphatized finish for surfaces of ducts exposed to view.

B. Reinforcement Shapes and Plates: Galvanized steel reinforcement where installed on galvanized, sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.03 CONTROL DAMPERS

A. Control dampers meeting the following specifications shall be furnished and installed where shown on plans. Damper blades shall be 16 gage galvanized steel 3V type with three longitudinal grooves for reinforcement. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper. Blade seals shall be TPE. Linkage shall be blade-to-blade concealed in jamb (out of the airstream) to protect linkage and reduce pressure drop and noise. Damper frame shall be 16 gage galvanized steel formed into a structural hat channel shape with reinforced corners to meet 11 gage criteria. Bearings shall be corrosion resistant, permanently lubricated, synthetic (acetal) sleeve type rotating in extruded holes in the damper frame for maximum service. Axles shall be square and positively locked into the damper blade. Jamb seals shall be flexible stainless-steel compression type to prevent leakage between blade end and damper frame. The damper manufacturer’s submittal data shall certify all air leakage and air performance pressure drop data is licensed in accordance with the AMCA Certified Ratings Program for Test Figures 5.2, 5.3 and 5.5. Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D.

B. Basis of design: Greenheck model VCD-23.

2.04 CONTROL DAMPER ACTUATORS

A. Control damper actuators shall be fast acting, two position, spring return, direct coupled, with an integral junction box for on/off damper control. The actuator shall accept an on/off signal from a single-pole, single-throw (spst) controller. Reversible mounting shall allow actuator to be used for either clockwise (cw) or counterclockwise (ccw) spring rotation. Input voltage shall be 120 VAC.

B. Basis of design: Honeywell model MS4104F1010.

2.05 MANUAL-VOLUME DAMPERS

A. General: Factory fabricated with required hardware and accessories. Stiffen damper blades for stability. Include locking device to hold single-blade dampers
in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class.

B. Steel Standard Volume Dampers: Multiple- or single-blade, opposed-blade design unless indicated otherwise, standard leakage rating, with linkage outside airstream, and suitable for horizontal or vertical applications.

1. Steel Frames: Hat-shaped, galvanized, sheet steel channels, minimum of 16 gauge thick, with mitered and welded corners; frames with flanges where indicated for attaching to walls; and flangeless frames where indicated for installing in ducts.

2. Roll-Formed Steel Blades: 16 gauge thick, galvanized, sheet steel.


4. Tie Bars and Brackets: Galvanized steel.

C. Damper Regulators: Zinc-plated, die-cast core with dial and handle made of 3/32-inch-thick zinc-plated steel, and a 3/4-inch hexagon locking nut. Include center hole to suit damper operating-rod size. Include elevated platform for insulated duct mounting.

2.06 GRILLES

A. General: Provide grilles as specified herein and indicated by the drawings.

B. Grilles shall be finished with the standard factory baked enamel finish, unless otherwise specified by the Architect, and shall conform to the schedules shown on the contract documents.

C. Coordinate location, ceiling and frame type with the Architectural Documents.

2.07 FLEXIBLE CONNECTORS

A. General: Flame-retarded or noncombustible fabrics, coatings, and adhesives complying with UL 181, Class 1. Fabricate designed to meet UL 214, NFPA 90A, airtight and waterproof.

B. Standard Metal-Edged Connectors: Factory fabricated with a strip of fabric 3-inches wide attached to two strips of 3-inch-wide, minimum 24-gauge thick, galvanized, sheet steel or 0.032-inch aluminum sheets. Select metal compatible with connected ducts.


1. Minimum Weight: 22 oz./sq. yd..

2. Tensile Strength: 240 lbf/inch in the warp, and 220 lbf/inch in the filling.
2.08 ACCESSORY HARDWARE

A. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

B. Bird Screen: Aluminum, 1/2-inch-square mesh, 0.063-inch wire.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install duct accessories according to applicable details shown in SMACNA’s “HVAC Duct Construction Standards–Metal and Flexible” for metal ducts.

B. Control Dampers:
   1. Damper Actuators: Actuators shall not be mounted in the air stream.
   2. Install materials in accordance with manufacturer’s instructions and details on drawings. Install electrical components and use electrical products complying with requirements of Division 26.

C. Volume Dampers:
   1. Install volume dampers at all grille duct connections. Place as far upstream as layout and accessibility allow.

D. Grilles
   1. Location: Locate per Architectural drawings in areas with finished ceilings, otherwise where shown.
   2. Verification: Verify that ceiling grille frames match ceiling type and finish prior to ordering.

3.02 ADJUSTING

A. Adjust duct accessories for proper settings.

B. Final positioning of manual-volume dampers is specified in Division 23 Section "Testing, Adjusting, and Balancing."

END OF SECTION
CITY OF KIRKLAND
JUANITA BEACH PARK BATHHOUSE

SECTION 23 34 15
FANS

PART 1 GENERAL

1.01 SUMMARY
A. This Section includes the following:
   1. In-Line Exhaust Fans.
   2. Downblast Roof Exhaust Fans.
B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. Division 23 Section “Common Motor Requirements for Heating and Ventilating Equipment” for basic motor requirements.
   2. Division 26 sections for power supply wiring, field installed disconnects, electrical devices, and motor controllers.

1.02 PERFORMANCE REQUIREMENTS
A. Project Altitude: Base air ratings on actual site elevations.
B. Operating Limits: Classify according to AMCA 99.
C. Fan Schedule: The following information is described in an equipment schedule on the Drawings.
   1. Fan performance data including capacities, outlet velocities, static pressures, sound power characteristics, motor requirements, and electrical characteristics.
   2. Fan arrangement including wheel configuration, inlet and discharge configurations, and required accessories.

1.03 SUBMITTALS
A. General: Submit in accordance with Section 01 33 00, Shop Drawings, Product Data, and Samples.
B. Product Data including rated capacities of each unit, weights (shipping, installed, and operating), furnished specialties, accessories, and the following:
   1. Certified fan performance curves with system operating conditions indicated.
2. Certified fan sound power ratings.

3. Motor ratings and electrical characteristics plus motor and electrical accessories.

4. Material gages and finishes, including color charts.

5. Dampers, including housings, linkages, and operators.

C. Shop Drawings from manufacturer detailing equipment assemblies and indicating dimensions, weights, loadings, required clearances, method of field assembly, components, and location and size of each field connection.

D. Wiring diagrams detailing wiring for power and control systems and differentiating clearly between manufacturer-installed and field-installed wiring.

E. Maintenance data for fans to include in the operation and maintenance manual specified in Section 01 78 50 and in Division 23 Section "Common Work Results for Heating and Ventilation."

1.04 QUALITY ASSURANCE

A. Electrical Component Standard: Provide components that comply with NFPA 70 and that are listed and labeled by UL.

B. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled by UL.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

C. AMCA Compliance: Provide products that meet performance requirements and are licensed to use the AMCA Seal.

D. NEMA Compliance: Provide components required as part of fans that comply with applicable NEMA standards.

E. Testing Requirements: The following factory tests are required as indicated:

1. Sound Power Level Ratings: Comply with AMCA 301, "Methods for Calculating Fan Sound Ratings From Laboratory Test Data." Test fans according to AMCA 300, "Reverberant Room Method for Sound Testing of Fans." Label fans with the AMCA Seal.

2. Fan Performance Ratings: Establish flow rate, pressure, power, air density, speed of rotation, and efficiency by factory tests and ratings according to AMCA 210, "Laboratory Methods of Testing Fans for Rating."
1.05 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements. Verify clearances.

B. Do not operate fans until ductwork is clean.

1.06 COORDINATION AND SCHEDULING

A. Coordinate the installation of roof curbs, equipment supports, and roof penetrations. Roof specialties are specified in Division 07 Sections.

B. Coordinate the installation of equipment supports.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver fans as factory-assembled units, to the extent allowable by shipping limitations, with moisture proof protective crating and covering.

B. Lift and support units with the manufacturer’s designated lifting or supporting points.

C. Fans shall not be exposed to moisture or dust during construction or storage.

1.08 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

1. Inline Exhaust Fans:
   a) ACME Engineering & Mfg. Corp.
   b) Cook (Loren) Co.
   c) Greenheck Fan Corp.
   d) Penn Ventilation.

2. Downblast Roof Exhaust Fans:
   a) ACME Engineering & Mfg. Corp.
   b) Cook (Loren) Co.
c) Greenheck Fan Corp.

d) Penn Ventilation.

2.02 IN-LINE EXHAUST FANS, EF-1, EF-3

A. General: Direct drive inline cabinet centrifugal exhaust fan for ceiling mounted applications. Fan shall be UL listed 507 – Electric Fans.

B. Wheel: Forward curved centrifugal wheel constructed of galvanized steel statically and dynamically balanced in accordance to AMCA Standard 204-05.

C. Motors: Motor enclosures shall be open drip-proof (ODP), opening in the frame body and or end brackets. Motors are permanently lubricated sleeve bearing type to match with the fan load and furnished at the specific voltage and phase. Motor shall be compatible for use with speed controls.

D. Housing: Constructed of galvanized steel. Interior shall be lined with 0.5 inches of acoustical insulation.

E. Accessories: Provide speed controller.

2.03 DOWNBLAST ROOF EXHAUST FAN, EF-2

A. Description: Direct-drive downblast centrifugal fans as indicated, consisting of housing, wheel, fan shaft, bearings, motor, drive assembly, curb base, and accessories.

B. Construction: Minimum 16-gauge spun-aluminum, removable dome top and outlet baffle, square one-piece aluminum base with welded corners; venturi inlet cone, and integral conduit chase.

C. Fan Wheel: Aluminum hub and wheel with backward-inclined blades.

D. Motor: Motor to be an electronic commutation (EC) motor specifically designed for fan applications.

E. Direct-Drive Units: Motor mounted in airstream on vibration isolators.

F. Bird Screen: 1/2-inch wire mesh, aluminum or brass wire.

G. Accessories: The following items are required as indicated:

1. Variable-Speed Controller: Solid-state control to reduce speed from 100 percent to 50 percent, mount as indicated on plans.

2. Motorized Damper: Damper blades shall be 16-gage galvanized steel 3V type with three longitudinal grooves for reinforcement. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the
damper. Blade seals shall be TPE. Linkage shall be blade-to-blade concealed in jamb (out of the airstream) to protect linkage and reduce pressure drop and noise. Damper frame shall be 16 gage galvanized steel formed into a structural hat channel shape with reinforced corners to meet 11 gage criteria. Bearings shall be corrosion resistant, permanently lubricated, synthetic (acetal) sleeve type rotating in extruded holes in the damper frame for maximum service. Axles shall be square and positively locked into the damper blade. Jamb seals shall be flexible stainless-steel compression type to prevent leakage between blade end and damper frame. The damper manufacturer’s submittal data shall certify all air leakage and air performance pressure drop data is licensed in accordance with the AMCA Certified Ratings Program for Test Figures 5.2, 5.3 and 5.5. Damper air performance data shall be developed in accordance with the latest edition of AMCA Standard 500-D. Damper shall be mounted in curb base; factory set to close when fan stops.

3. Roof Curbs: Provide roof curbs that are compatible with the roof type. Refer to general construction drawings and specifications for roof types. Minimum 0.08-inch aluminum, welded corners, rigid fiberglass insulation, minimum 12-inch high, and wood nailer. Size as required to suit roof opening and fan base.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine areas and conditions for compliance with requirements of installation tolerances and other conditions affecting performance of the fans. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install fans according to manufacturer's written instructions.

B. Support units using the external vibration-control devices as indicated.

C. Install units with clearances for service and maintenance.

D. Secure roof-mounted fans to roof curbs with cadmium-plated hardware. Installation of roof curbs is specified in Division 07 Sections.

E. Label units according to requirements specified in Division 23 Section "Common Work Results for Heating and Ventilation."

3.03 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate the general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors.
B. Electrical: Conform to applicable requirements in Division 26 Sections.

C. Grounding: Ground equipment. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Provide services of a factory-authorized service representative to supervise the field assembly of components and installation of fans, including duct and electrical connections, and to report results in writing.

3.05 ADJUSTING

A. Adjust damper linkages for proper damper operation.

3.06 CLEANING

A. After completing installation, inspect exposed finish. Remove burrs, dirt, and construction debris, and repair damaged finishes including chips, scratches, and abrasions.

B. Clean fan interiors to remove foreign material and construction debris. Vacuum clean fan wheel and cabinet.

3.07 START-UP PROCEDURES

A. Final Checks before Startup: Perform the following operations and checks before startup:

1. Verify that shipping, blocking, and bracing are removed.

2. Verify that unit is secure on mountings and supporting devices and that connections for piping, ducts, and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnects.

3. Perform cleaning and adjusting specified in this Section.

4. Verify that manual volume dampers in connected ductwork systems are in the fully open position.

5. Disable automatic temperature-control operators.

B. Starting procedures for fans are as follows:

1. Energize motor; verify proper operation of motor, drive system, and fan wheel. Adjust fan to indicated RPM.
2. Measure and record motor voltage and amperage.

C. Shut unit down and reconnect automatic temperature-control operators.

D. Refer to Division 23 Section "Testing, Adjusting, and Balancing" for procedures for air-handling-system testing, adjusting, and balancing.

3.08 DEMONSTRATION

A. Train Owner's maintenance personnel on procedures and schedules related to startup and shutdown, troubleshooting, servicing, and preventive maintenance.

B. Review data in the operation and maintenance manuals. Refer to Section 017850.

C. Demonstrate operation of fans. Conduct walking tour of the Project. Briefly identify location and describe function, operation, and maintenance of each power ventilator.

END OF SECTION
SECTION 23 55 33
ELECTRIC HEATERS

PART 1 GENERAL

1.01 SUMMARY

A. This Section includes electric heaters.

B. Related sections include the following:

C. Division 23 Section "Common Work Results for Heating and Ventilation".

1.02 SUBMITTALS

A. General: Submit each item in this Article according to Section 01 33 00, Shop Drawings, Product Data, and Samples.

B. Product data for each type of product specified, including weights, dimensions, minimum clearances, metal gauges, and data on features and components.

C. Wiring diagrams detailing power and control wiring and differentiating clearly between manufacturer-installed wiring and field-installed wiring.

D. Field test reports from a qualified independent inspecting and testing agency indicating and interpreting test results relative to compliance with performance requirements of heaters.

1.03 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

B. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver heaters as factory-assembled units, with moisture proof protective crating and covering.

B. Heaters shall not be exposed to moisture or dust during construction or storage.

1.05 WARRANTY

A. Comply with provisions of Section 01 78 70, Warranties and Bonds.

B. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the
Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 MANUFACTURERS

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

B. Electric Heaters:
   a) Chromalox
   b) King Electrical Manufacturing Company
   c) Markel Products Company
   d) Q-Mark (Marley Electric Heating Company)
   e) Modine
   f) Vulcan

2.02 ELECTRIC CEILING HEATERS

A. Electric ceiling heater with fan, UL Listed.

B. Blower and Motor: A tangential cylindrical blower, shall be driven by a shaded pole, permanently lubricated, C-frame type motor with impedance protection and sealed bearings. Motors shall be the same voltage as the heater. The motor and all wiring shall be totally isolated from the heating chamber for protection from heated air.

C. Elements: Element assemblies shall be constructed of coiled Nickel Chromium alloy, corrosion resistant wire strung through a minimum of four rows of mica insulator. Element assemblies shall have factory provided connection to allow field modification to 50% wattage at time of installation.

D. Thermal Overload: Heaters shall be equipped with thermal overload Smart Limit Protection®, which disconnects elements and motor in the event normal operating temperatures are exceeded. If thermal overload trips due to abnormal operating temperatures, thermal overload shall remain open until manually reset by turning the heater off for fifteen minutes.

E. Ceiling Can: The ceiling can shall be 22-gauge electrogalvanized steel and shall contain knockouts through which power leads are brought. The ceiling can shall be provided with a depth gauge, extending the full length of the ceiling can. The ceiling can shall be supplied with a factory installed groundwire.
F. Grille: The grille shall be a louvered, one-piece design with rounded edges on all four sides, with rounded corners to prevent snags from contact with other materials. The grille shall be epoxy powder-coated in the color specified by manufacturer.

G. Accessories: Provide with electronic wall mounted line voltage thermostats with insulated pads and lockable covers. King Electrical ES120.

PART 3  EXECUTION

3.01  EXAMINATION

A. Examine areas to receive unit heaters for compliance with requirements for installation tolerances and other conditions affecting performance of units. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02  INSTALLATION

A. Install heaters as indicated, according to manufacturer's written instructions and NFPA 90A.

B. Install controls as specified in Division 23 Section "Instrumentation and Control for HVAC Systems."

3.03  CONNECTIONS

A. Electrical: Conform to applicable requirements of Division 26 Sections.

B. Install electrical devices furnished with heaters but not specified to be factory mounted.

C. Connect heaters and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.04  ADJUSTING AND CLEANING

A. After completing system installation, inspect heaters and associated components. Repair scratches and mars of finish to match original finish. Clean unit internally using methods and materials recommended by manufacturer.

3.05  START-UP PROCEDURES

A. Start-up Services: Provide start-up service, as specified below.

B. Start units and operate controls and safeties.
C. Test and adjust controls and safeties. Replace damaged or malfunctioning controls and equipment.

D. Correct deficiencies identified by tests and observations and retest until specified requirements are met.

END OF SECTION
PART 1 - GENERAL

1.1 REFERENCES
A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.


1.2 RELATED SECTIONS
A. Section 26 05 19 - Low-Voltage Electrical Power Conductors and Cables
B. Section 26 05 26 - Grounding and Bonding
C. Section 26 05 73 - Overcurrent Protective Device Coordination Study
D. Section 26 24 16 - Panelboards
E. Section 26 27 26 - Wiring Devices
F. Section 26 28 16 - Enclosed Switches and Circuit Breakers
G. Section 27 15 00 - Communications Horizontal Cabling

1.3 SUMMARY
A. Contractor shall engage the services of a qualified testing organization to provide inspection, testing, calibration, and adjustment of the electrical distribution system and generation equipment listed in paragraph entitled "Maintenance Tests and Inspections" herein. Organization shall be independent of the supplier, manufacturer, and installer of the equipment.

B. Perform all equipment and device testing after installation and prior to substantial completion or owner occupancy, allowing enough time for corrective action of all deficiencies.

C. Review manufacturer's installation instruction and confirm that equipment is installed in accordance with manufacturer's instructions.
D. Prior to performing tests confirm that the equipment is clean and free of construction debris and dust.

1.4 SUBMITTALS

A. Submit the following for review:

1. Name and qualifications of organization. Organization shall have been regularly engaged in the testing of electrical materials, devices, installations, and systems for a minimum of 5 years. The organization shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA MTS.

2. Name and qualifications of the lead engineering technician performing the required testing services. Include a list of three comparable jobs performed by the technician with specific names and telephone numbers for reference. Testing, inspection, calibration, and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute for Certification in Engineering Technologies (NICET) with a minimum of 5 years' experience inspecting, testing, and calibrating electrical distribution and generation equipment, systems, and devices.

1.5 QUALITY ASSURANCE

A. Test Equipment: The testing firm shall have a calibration program, and test instruments used shall be calibrated in accordance with NETA ATS. Provide a complete list of test equipment utilized in all of the testing. Include manufacturer, model number, current calibration date, next calibration date and age of equipment.

B. Testing, inspection, calibration and adjustments shall be performed by an engineering technician, certified by NETA or the National Institute in Engineering Technologies with a minimum of five years of experience testing, calibrating electrical distribution and generation equipment, systems, and devices.

1.6 CLOSEOUT

A. Testing Performed by an Independent Testing Company.

1. Include certified copies of inspection reports and test reports in the O&M manual. Reports shall include certification of compliance with specified requirements, identify deficiencies, and recommend corrective action when appropriate. Type and neatly bind test reports to form a part of the final record.

2. Testing company test stamps or stickers on all tested equipment. Indicate testing company name, testing date and expiration date.

B. Testing Performed by the Division 26 Contractor: Submit a letter listing the equipment/systems tested and a certification stating that all testing has been completed per NETA ATS. Include certification letter in the O&M Manual.
C. Testing Performed by the Equipment Supplier: Include a copy of the equipment Suppliers test report for each system in the O&M Manual.

PART 2 - PRODUCTS

2.1 TESTING COMPANY

A. Retain the services of an independent testing company that is qualified to test electrical equipment, and is a state approved testing company.

B. The testing company shall perform acceptance tests and inspections for all equipment listed in Paragraph 3.1A. Test methods, procedures, and test values shall be performed and evaluated in accordance with NFPA 70B, NETA ATS, the manufacturer's recommendations, and as required by each applicable specification section. Equipment shall be placed in service only after completion of required tests and evaluation of the test results has been completed.

2.2 TEST EQUIPMENT

A. The testing firm shall provide all apparatus and material required for testing. The testing firm shall use installation tools and test equipment which are designed for the specific task and shall use this equipment per the manufacturer's instructions. All test equipment shall have current calibration certification by a third party calibration laboratory, and shall have a signed and dated calibration sticker affixed to the device. Calibration shall be traceable to the National Bureau of Standards and be less than 6 months since last calibration. Defective test equipment and installation tools shall not be used. Installation tools such as torque wrenches shall be calibration certified.

PART 3 - EXECUTION

3.1 ACCEPTANCE TESTS AND INSPECTIONS

A. The following testing shall be performed by the Independent Testing Company:
   1. Grounding and Bonding for Electrical Systems
   2. Overcurrent Protective Device and Coordination Study
   3. Panelboards
   4. Enclosed Switches and Circuit Breakers

B. The following testing shall be performed by the Division 26 Contractor:
   1. Low-Voltage Electrical Power and Conductors and Cables
   2. Wiring Devices
C. The following testing shall be performed by the equipment supplier:

1. Lighting Controls
2. Each Communications System specified in Division 27.

3.2 SCHEDULE

A. Perform all testing after installation and before energizing. All primary systems shall pass tests prior to placing in service. Notify Engineer and Owner’s representative 10 working days prior to performance of any test.

B. Insert a copy of each test report in the operation and maintenance manuals.

3.3 LABELS

A. Upon completion of the tests, a label shall be attached to all serviced devices. These labels shall indicate date serviced and the testing company.

3.4 FINAL ACCEPTANCE

A. Final acceptance is contingent upon satisfactory completion of acceptance tests and inspections.

END OF SECTION
SECTION 26 05 00
COMMON WORK RESULTS

PART 1 - GENERAL

1.1 SUMMARY

A. The work under this division includes furnishing all materials, equipment, labor, supervision, tools and items necessary for the construction, installation, connection, testing and operation of all electrical work for this project as shown on the electrical drawings specified herein.

B. Related Work Described Elsewhere: Where other divisions require electrical materials or installations, comply with all applicable requirements herein. Provide all electrical materials and installation work required to connect, test and operate equipment required by other divisions. Electrical installations required by other divisions but not shown on the electrical drawings shall be provided.

C. Warranty: The Contractor shall guarantee all work installed under this specification and make good, repair or replace at his own expense any defective work, materials or parts. Incandescent lamps are not warranted but all shall be operating at time of final acceptance.

1.2 REGULATIONS

A. Codes and Ordinances: Comply with all applicable codes, ordinances and regulations including the National Electrical Code, the Washington Administrative Code, National Electrical Safety Code, WISHA, NFPA and all other national, state and local codes and ordinances. Notify the Engineer of any noncompliance in contract documents to applicable codes and regulations prior to installation of the work. Changes in the work after initial installation due to requirements of code enforcing agencies shall be at no additional cost to the Owner.

B. Permits: Provide and pay for all permits and fees required for this project. In addition to paying for all permits and fees, the Contractor shall be responsible for contacting the various Approving Authorities, arranging for review of shop drawings where appropriate, scheduling inspections in a timely manner, and making necessary corrections as required by the Approving Authorities.

C. Approving Authority: It is the Contractor's responsibility to ascertain and contact the appropriate "Approving Authorities" for this project. Approving Authorities will include, but not be limited to the electrical inspector and the Fire Marshal having jurisdiction.

D. Certificate of Inspection: Obtain a Certificate of Electrical Inspection indicating final acceptance from the local inspecting authority.

09/30/19
E. Safety Measures To Be Taken: The Engineer has not been retained or compensated to provide design and construction review services relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work. The Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. The duty of the Engineer to conduct construction observations of the contractor's performance is not intended to include review of the adequacy of the contractor's safety measures in, on or near the construction site.

1.3 DRAWINGS AND SPECIFICATIONS

A. Intent: The electrical drawings and specifications are intended to include all labor and materials necessary to provide a complete and operating facility. Any materials shown and called for on the drawings but not mentioned in the specifications, or vice versa, which are necessary for the proper completion of the installation or operation of the equipment, shall be furnished the same as if specifically called for in both. By submitting a bid, the Contractor is acknowledging that he has made a thorough examination of the contract documents, existing site conditions, and has determined that these documents and conditions do sufficiently describe the scope of construction work required under this contract. Any questions regarding interpretation of the contract documents shall be made in writing in a timely manner prior to the bid date to allow reasonable time for resolution of the questions.

B. Diagrammatic Drawings: The electrical drawings are diagrammatic and do not show exact or complete raceway and wiring configurations, routing, rating or the necessary number and types of raceway fittings or pull boxes. Provide all labor and materials required to execute the work.

1.4 SUBMITTALS AND SHOP DRAWINGS

A. It is the Contractor's responsibility to thoroughly review vendor-assembled shop drawings, catalog cuts, etc. to ensure that these documents are complete and comply with the specifications.

B. All submittals and shop drawings must be stamped by the Electrical Contractor and the General Contractor confirming they have been reviewed and comply with the contract documents. Submittals which are not stamped will be returned unreviewed.

C. Submittal Format:

1. General: The submittals must include all specified material. Multiple submittals will not be accepted.

2. Electronic submittals can be submitted. However, bound hard copies of the distribution equipment (switchboards, transformers, distribution panels and panelboards) and lighting must be provided.

3. Shop Drawings: Only one hard copy shall be provided for review. One electronic copy (PDF) will be returned.
D. Review: The review of a manufacturer's name or product does not relieve the Contractor of the responsibility for providing materials and equipment which comply in all details with the requirements of the contract documents. Contractor shall be solely responsible for submitting materials at such a time to allow a minimum of two weeks for Engineer's review.

1.5 OPERATIONS AND MAINTENANCE MANUALS

A. Prepare operations and maintenance manuals for all electrical equipment installed on this project.

B. Provide table of contents at front of manual indicating general content of each section. Provide index for each section of the manual with complete equipment catalog item or identification.

C. The information and diagrams included must be on the specific equipment installed for this project. General "product line" information is not acceptable. The equipment model and catalog numbers with appropriate prefixes and suffixes must be clearly indicated on the data sheets. Manuals shall contain shop drawings, schematic and wiring diagrams (showing all external connections), parts lists, operating and maintenance information. Any modifications to equipment in the field shall be updated on the drawings, diagrams, etc. to reflect the "as-built" conditions.

D. Bind with three-screw post-type binder with heavy-duty hardboard cover and cloth backing. Imprint the edge of volume with name of the project, year of completion and the words "Electrical Equipment." Front of manual shall be imprinted with the words "Electrical Equipment," the name of the project, the name of the Owner, year completed, and name of the Architect, Engineer and Contractor. All printing in gold lettering. If the thickness of the manual exceeds approximately two inches, provide separate volumes, each being a maximum two inches thick. Each volume shall be imprinted as described above and include the volume number.

E. Submit 2 CD-ROM copies of the operations and maintenance manual. Disk data is to be in Adobe Acrobat v11.0 or later. Arrange information and materials in the same order and categories as is typical of printed hard copy O&M manuals as described in this section. Disk PDF file shall include electronic "bookmarks" for each category, specification section and subsection.

F. One preliminary copy shall be submitted to the Engineer for review 30 days prior to completion of the project. Preliminary copy shall include proposed wording for cover and back edge of the manual. Submit final bound copies for distribution as required in Division 01.

1.6 RECORD DRAWINGS

A. A record shall be made during the progress of the project indicating the work as actually installed. Corrections and changes shall be kept up to date at all times on a separate set of record drawings kept at the job site for review. Mark-ups may be
schematic as related to interior raceway systems; however, all raceways shall be shown in proper relationship with junction boxes, panelboards, devices and equipment. Raceways installed below grade shall be shown with both horizontal and vertical dimensions with an accuracy of ± six inches.

B. Project Closeout: The Contractor shall provide as-built drawings at completion of the project indicating work as revised, detailed and actually installed.

C. Additional Record Drawings: Refer to Division 27 sections for additional record drawing requirements. AutoCAD production requirements also apply to all special system drawings.

1.7 DEFINITIONS

A. Provide: To furnish and install.

B. Wiring: Raceway, conductors and connections.

C. Exposed: Visible from occupied areas.

D. Install: To set in position and make fully operational.

E. Furnish: Purchase and deliver to the job site.

F. Required: As required by code, authority having jurisdiction or contract documents for the system and/or installation to be fully operational.

1.8 COORDINATION

A. UTILITIES SERVICES

1. It shall be the Contractor's responsibility to contact all utility companies, including but not limited to the power company, telephone company and cable television company, and verify the extent of work to be performed by the utility companies. All other labor and necessary materials, provided by the utility companies shall be provided by the Contractor.

2. Coordination and scheduling new services with the various utility companies is the sole responsibility of the Contractor.

3. In general, the Contractor shall be responsible for providing the following:

   a. Trenching, backfill and compaction.
   b. Raceways.
   c. Manholes and vaults (including grounding).
   d. Concrete encasement of raceways (where called out on the drawings or specified).
   e. Obtaining all necessary permits.

4. Service Charges: All utility service charges will be paid by the Owner.
5. Applications for Services: It shall be the contractor's responsibility to complete and submit all required applications for service with the various utility companies.

B. Work of Other Trades: The electrical drawings do not show complete details of the building construction. Refer to the Architectural, Structural, Civil, Landscape, Mechanical and Kitchen Drawings for details which may affect the execution of this work. Specific locations of construction features shall be obtained from the reference drawings, field measurements, or the trade providing the material or equipment. No extra payments will be allowed for failure to obtain this information.

C. The Contractor will not be paid for work requiring reinstallation due to lack of coordination prior to installation such as removing and replacing, relocating, cutting, patching or finishing. Special attention is called to the following items and all conflicts shall be coordinated prior to installation:

1. Light switches will be located on the "strike" side of the door.
2. All electrical outlets, lighting fixtures and other electrical outlets and equipment are installed to avoid conflict with grilles, pipes, sprinkler heads, ducts and other mechanical equipment.
3. Electrical outlets, lighting fixtures and equipment are to be installed in proper relation to cabinets, counters, doors and other architectural appurtenances.
4. Electrical characteristics (HP, kVA, voltage, phase, fusing, overload protection) of actual equipment furnished under other divisions being different from that shown on the electrical drawings.

D. Provide access panels for electrical items that are behind finished surfaces or otherwise concealed.

E. Provide all required firestopping for electrical work.

PART 2 - PRODUCTS

2.1 STANDARD OF QUALITY

A. General: Whenever any material or equipment is specified by patent or proprietary name or by the name of the manufacturer, such specification shall establish the minimum standard of quality in that particular field of manufacture. The engineer shall be the sole and final judge as to quality and acceptability of substitutions, no exceptions.

2.2 PRODUCT LISTING AND LABELING

A. All electrical equipment shall be Underwriters Laboratories listed and labeled. Equipment in compliance with UL standards but not bearing their label is not acceptable. If the manufacturer cannot arrange for labeling of an assembled unit at the factory, the necessary inspection and acceptance by the testing facility shall be
performed in the field at no additional cost to the Owner, and be acceptable to the Authority Having Jurisdiction.

2.3 ELECTRICAL DISTRIBUTION EQUIPMENT

A. Scope: Provide the equipment for the various primary and secondary voltage distribution systems including switchgear, service transformer, service switchboards, distribution switchboards, panelboard equipment, motor control centers, dry-type transformers, and all miscellaneous equipment.

B. Type: The distribution equipment shall provide a quality system with the highest degree of safety, protection, and integrity.

C. Space for Future Circuit Breakers and Fused Switches: Provide as indicated on drawings; shall be completely equipped for the future addition of a circuit breaker or fused switch, including all connections. Each switchboard or panelboard section shall be fully bussed with spaces available the entire height of the equipment.

D. Finish: Finish of all distribution equipment and other associated equipment shall match and unless specified otherwise shall be manufacturer's standard light gray.

E. Phasing:

1. Phase arrangement for all bussing and terminations in switchboards, panelboards, motor starter centers, transformers, etc. shall be as follows when viewed from the front:
   - Phase A Front Left Top
   - Phase B Center Center Center
   - Phase C Rear Right Bottom

2. Lugs for switchboards, panelboards, transformers and other distribution equipment connections shall be hydraulically set compression lugs.

F. Manufacturer: The number of manufacturers shall be kept to a minimum to maintain close control and coordinate the various components of the distribution systems. All electrical distribution equipment shall be provided by the same manufacturer. Dimensions are critical. Each manufacturer shall verify that the equipment proposed will fit within the spaces provided with adequate working clearances.

PART 3 - EXECUTION

3.1 GENERAL

A. All materials shall be new, free from defects and arrive at the job site in their original unopened containers.
B. Comply with NECA 1. Where a conflict exists between NECA 1 and the contract documents, the most restrictive/expense shall govern.

3.2 MATERIAL STORAGE

A. Make all necessary provisions for storing materials and equipment at site so as to insure the quality and fitness of the items to be incorporated in the work. Equipment shall be stored to prevent damage and corrosion.

3.3 INTERRUPTION OF EXISTING ELECTRICAL SERVICE

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary electrical services.

1. Notify the Owner no fewer than 48 hours in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without the Owner's written permission.

3.4 EXISTING CONDITIONS

A. General: Specific scope of demolition work and operating conditions to be encountered shall be verified by on-site review prior to submitting bid. Demolition work, in general, is noted or shown on the documents based upon available "drawings of record" and may not show the actual conditions as they presently exist. The Contractor shall be responsible for removing or modifying the existing electrical installation as required by the building alterations. The Contractor shall be responsible for protection of existing equipment and wiring to be retained or reinstalled and shall replace any equipment damaged during the process of removal and reinstallation.

B. Owner Retained Equipment: The Owner may wish to retain certain specific items scheduled for demolition. The Contractor shall carefully remove these items, provide protection and packaging as may be required to protect the equipment and turn over said equipment to the Owner at a place designated on the jobsite. Any equipment that the Owner does not desire to retain shall become the property of the Contractor and be removed from the site.

C. Existing Raceways and Wiring:

1. No existing raceways or wiring shall be reused unless specifically shown on the drawings.
2. Unused Raceways and Wiring: All unused conductors in existing buildings shall be removed. All unused raceway shall be removed except where located in or above existing construction which is not being altered and would require removal and replacement of the existing construction.
3. Continuity of Service To and In Existing Building: The Contractor shall reroute existing raceways, wiring and equipment which is in conflict with building alterations.

4. Ceiling Panels: Remove and reinstall all necessary panels in existing accessible ceilings, as required for the installation of electrical work. Where existing ceiling panels are damaged, they shall be replaced with new units. After ceiling removal and reinstallation is complete, the ceiling system appearance shall match adjacent similar ceilings that have not been removed.

5. Work Caused by Removal and Reinstallation of Existing Material: Existing electrical work which is to be removed and reinstalled as a result of the installation of work by other trades shall be performed by the Electrical Contractor at no additional expense to the Owner.

6. Existing fluorescent fixture ballasts to be removed shall be assumed to contain PCBs/Mercury and are to be treated as hazardous materials. Removal and disposal of these fixtures are to comply with all local, state and federal agency requirements. Provide documentation as required by all regulating agencies as proof of proper disposal.

7. Openings in walls and floors resulting from removal of conduits and/or devices are to be patched with materials equivalent to adjacent surfaces. Materials used for patching shall maintain the fire rating of the existing area.

8. Existing raceways and exposed cabling above existing suspended ceilings shall be resupported from the building structure.

### 3.5 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION

A. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.

### 3.6 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS

A. General:

1. Provide sleeves for all penetrations unless core-drilled holes or formed openings are used.

2. Extend sleeves installed in floors two inches above finished floor level.

3. Size sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.

4. Seal space outside of sleeves with grout for penetrations of concrete and masonry. Pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.

B. Interior Penetrations of Nonfire-Rated Walls and Floors: Provide EMT sleeves. Seal space between sleeve and wall or floor, using joint sealant appropriate for size, depth and location of joint.

C. Fire-Rated Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings and floors at raceway penetrations.
1. Penetrations at Walls, Partition and Ceilings: Provide STI "EZ Path" assemblies.

D. Roof Penetration Sleeves: Provide a four-pound lead-plumbing vent flashing. Provide counter flashing attached above with a stainless-steel draw band clamp.

E. Aboveground, Exterior-Wall Penetrations: Provide steel pipe sleeves. Select sleeve size to allow for one-inch annular clear space between pipe and seal penetration utilizing mechanical sleeve seals.

F. Underground, Exterior-Wall Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for one-inch annular clear space between raceway or cable and sleeve. Seal penetration utilizing mechanical sleeve seals.

3.7 FIRESTOPPING

A. Provide firestopping to penetrations of fire-rated floor, wall and ceiling assemblies for electrical installations to restore original fire-resistance rating of the assembly.

3.8 CUTTING AND PATCHING

A. Provide all required cutting, demolition and patching required for the installation of the electrical work. Penetrations through structural walls, ceiling or floor slabs shall be core drilled. In no case shall structural members be penetrated without prior approval of the structural engineer.

3.9 PAINTING

A. Touch up electrical equipment with factory-finished surfaces as required using factory-furnished paint. Do not paint screw heads, hinges, nameplates, hardware, etc. All surface-mounted raceways in finished areas shall be painted to match adjacent surfaces.

3.10 CLEANING

A. Promptly remove waste material and rubbish resulting from electrical work.

B. Prior to energizing equipment, remove all dirt and debris. Vacuum and wipe-down all surfaces.

C. Clean all equipment and fixtures at completion of the project.
3.11 CONSTRUCTION OBSERVATION AND FINAL ACCEPTANCE

A. Site Review: On-site meetings or reviews of construction by the Engineer shall not be construed as acceptance by these parties as related to quantities, rough-in locations and compliance with code enforcing authorities.

B. Testing: The Contractor shall test all wiring and all electrical equipment to verify absence of grounds and short circuits and verify proper operation, rotation, and phase relationship. Contractor will be responsible for scheduling of tests and demonstrations at times mutually acceptable to the Owner. All equipment shall be demonstrated to operate in accordance with the requirements of this specification and the manufacturer's recommendations. Operate every device manually and automatically in accordance with its purpose. Tests shall be performed in the presence of the Owner or his designated representative. All instruments and personnel required to conduct the test shall be provided by the Contractor. Any test not witnessed by the Owner shall be waived by written document. All such documents must become the property of the Owner upon completion of construction.

3.12 INSTRUCTION FOR OWNER'S PERSONNEL

A. Scope: Following initial operation of all electrical equipment and prior to acceptance of the electrical work, conduct demonstrations of equipment operation and instruction periods for the Owner's representatives.

B. Instruction Periods: Shall include preliminary discussion and presentation of information from maintenance manuals with appropriate references to drawings, followed by tours of equipment spaces explaining maintenance requirements, access methods, servicing and maintenance procedures, settings and available system and equipment adjustments.

C. Contractor's representatives, in general, who conduct these instructions and demonstrations shall be qualified foremen or superintendents acquainted with this project and from the trade involved. The representative shall be the manufacturer's representatives with operating experience and substantial design experience on this project for major equipment. Their qualifications shall be submitted to the Architect and Engineer before conducting the instruction period.

D. Minimum Duration of Instruction Periods:

1. Electrical Distribution System: Four hours.
2. Low-Voltage Systems: Four hours each unless noted otherwise.
3. Refer to other sections of the specification for additional testing requirements.

E. Scheduling of Instruction Periods: Provide notice of contractor's readiness to conduct such instruction and demonstration periods to the Owner at least two weeks prior to each instruction period and reach agreement on the date of each instruction period.

F. Prepare a written statement of acceptance for the Owner's signature. The statement shall be substantially as follows:
"I (the Contractor), the associated factory representatives and the subcontractor, have thoroughly tested each of the following systems and have proved their normal operation to the Owner's representative and have instructed him in the operation and maintenance thereof."

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<th>Owner's System</th>
<th>Demonstrator</th>
<th>Representative</th>
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Owner's Representative ___________________________ Date __________

Electrical Contractor ___________________________ Date __________

G. Send copies of this acceptance to the Architect and the Engineer and place one copy in each maintenance manual.

H. Completion of Work: When requesting final inspection, provide ten day notice. Submit written certifications that the work has been fully completed in strict accordance with the plans and specifications.

END OF SECTION
SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER

PART 1 - GENERAL

1.1 SUBMITTALS
A. Product Data: Submit for each type of product provided.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cerro Wire
   2. CME Wire and Cable
   3. Encore Wire Corp.
   4. Republic Wire
   5. Southwire/General Cable
B. Conductors: Stranded copper.
C. Conductor Insulation: Type THHN-THWN.

2.2 CONNECTORS AND SPLICES
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. O-Z/Gedney
   2. 3M
   3. Tyco
B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
PART 3 - EXECUTION

3.1  CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Stranded copper.
B. Branch Circuits: Stranded copper.

3.2  CONDUCTOR INSULATION AND WIRING METHODS

A. Service Entrance: Type THHN-THWN single conductors in raceway.
B. Feeders: Type THHN-THWN single conductors in raceway.
C. Branch Circuits: Type THHN-THWN single conductors in raceway.
D. Minimum Conductor Size:
   1. Neutral: #10 AWG (#12 AWG minimum for dedicated neutrals and lighting circuits).
   2. Ground: #12 AWG.
   3. Phase Conductors (more than six in a raceway): #10 AWG.
   4. Phase Conductors (six or less in a raceway): #12 AWG.
   5. Branch Circuit Homeruns (longer than 75 feet): #10 AWG.
E. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, and strain relief device at terminations to suit application.
F. Class 1 Control Circuits: Type THHN-THWN in raceway.
G. Class 2 Control Circuits: Type THHN-THWN in raceway.

3.3  INSTALLATION OF CONDUCTORS AND CABLES

A. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
B. Wiring from separate systems shall not be intermixed in a common junction box.
C. Wiring shown in separate raceways shall not be combined.
D. Feeders: Make no splices unless shown on the plans.
E. Branch Circuits: Homeruns longer than 75 feet to the first outlet shall be #10 AWG minimum for the entire length of the circuit. Make no splices in homeruns.
3.4 CONNECTIONS

A. General: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

B. Feeder Splices: Make splices with hydraulically set long barrel connections insulated with heat shrink tubing.

C. Lighting and Receptacle Branch Circuit Splices: Insulated screw-on type connectors.

D. Wiring at Outlets: Install conductor at each outlet with at least six inches of slack.

E. Below-Grade Splices: Make splices in handholes and insulate with epoxy resin-type splicing kits. 3M or equal.

F. Termination at Busses (Panel, Switchboard, Transformers, ATS, etc.): Hydraulically-set compression lugs.

END OF SECTION
SECTION 26 05 26
GROUNDING AND BONDING

PART 1 - GENERAL

1.1 DEFINITIONS
   A. Telecommunications Room: MDF (MER) or IDF (TR or TC)

1.2 SUBMITTALS
   A. Product Data: Submit for each type of product provided.

PART 2 - PRODUCTS

2.1 CONDUCTORS
   A. Insulated Conductors: Stranded copper wire or cable insulated for 600 volts.
   B. Bare Copper Conductors: Stranded copper wire or cable.
   C. Grounding Bus: Rectangular bars of annealed copper, 1/4 x 2 x 12" in cross section unless otherwise indicated; with insulators.

2.2 CONNECTORS
   A. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type with at least two bolts.
   B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES
   A. Ground Rods: Copper-clad, 3/4 inch by 10 feet.
PART 3 - EXECUTION

3.1 APPLICATIONS

A. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
   1. Bury at least 24 inches below grade.
   2. Duct-Bank Grounding Conductor: Bury 12 inches above duct bank when indicated as part of duct-bank installation.

B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection with alternating bands of green and yellow tape using at least three bands of green and two bands of yellow.

C. Grounding Bus: Install in electrical and telecommunications equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus on one inch (minimum) insulated spacers six inches above finished floor, unless otherwise indicated.
   2. Provide No. 2/0 AWG from each ground bus to building grounding electrode system.

D. Conductor Terminations and Connections:
   3. Connections to Structural Steel: Exothermic welded connections.
   5. Ground Buses: Two-hole long barrel compression lugs.

3.2 BONDING

A. Insulated grounding bushings shall be installed to bond all feeder conduits to the switchboard ground bus or panel ground bus at both ends of feeder raceways. Insulated grounding bushings shall also be installed in all feeder pull boxes to bond all conduits together. Jumpers or bonds shall be copper and sized in accordance with Table 250-95 of the National Electrical Code.

3.3 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

A. Grounding Vaults and Manholes: Install a driven ground rod through vault or manhole floor, close to wall, and set rod depth so four inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare,
tinned-copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from two inches above to six inches below concrete. Seal floor opening with waterproof, nonshrink grout.

B. Grounding Connections to Vault and Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each vault or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

C. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items by connecting them to the grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than six inches from the foundation.

3.4 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

C. Signal and Communication Equipment: Provide No. 4 AWG minimum insulated grounding conductor in raceway from building grounding electrode system to each ER (MDF), and TR (IDF) Room, and control panel terminal cabinet.

1. MER (MDF) and TR or TC (IDF) Rooms: Terminate grounding conductor on a 1/4 x 2 x 12" grounding bus.
2. Control Panel Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

D. Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.5 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
B. Ground Rods: Drive rods until tops are two inches below finished floor or final grade, unless otherwise indicated.
   1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
   2. Grounding electrode system: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.
   3. Utilize exothermic welded connections to connect grounding electrode conductor to ground rod.

C. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
   1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
   2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly-mounted equipment. 
   3. Use exothermic-welded connectors for outdoor locations to connect grounding electrode conductor to ground rod.

D. Grounding and Bonding for Piping:
   1. Metal Water Service Pipe: Install insulated copper grounding conductors in conduit from building's main service equipment or grounding bus to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes using a bolted clamp connector, or by bolting a lug-type connector to a pipe flange using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
   2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
   3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

E. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart. Install tinned-copper conductor not less than No. 2/0 AWG between ground rods to form a ground ring. Bond columns to ground ring with No. 2/0 AWG and for taps to building steel.

F. Ufer Ground (Concrete-Encased Grounding Electrode): Fabricate according to NFPA 70 using a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG.
   1. If concrete foundation is less than 20 feet long, coil excess conductor within base of foundation.
2. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building grounding electrode system.

END OF SECTION
PART 1 - GENERAL

1.1 DEFINITIONS
   A. EMT: Electrical metallic tubing.
   B. IMC: Intermediate metal conduit.
   C. RMC: Rigid metal conduit.

1.2 SUBMITTALS
   A. Product Data: Submit for each of the products provided.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE AND ATTACHMENT COMPONENTS
   A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
      1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
         a. Cooper B-Line
         b. Thomas & Betts
         c. Unistrut
      3. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating.
      4. Painted Coatings: Manufacturer's standard painted coating.
      5. Channel Dimensions: Selected for applicable load criteria.

   B. Conduit and Cable Support Devices: Steel hangers, clamps and associated fittings, designed for types and sizes of raceway or cable to be supported.

   C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size and shape of
conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

D. Mounting, Anchoring and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud for use in hardened Portland cement concrete, steel, or wood with tension, shear and pullout capacities appropriate for supported loads and building materials where used. Subject to compliance with requirements, provide products by one of the following manufacturers:
   a. Hilti
   b. ITW Ramset/Red Head
   c. Simpson Strong-Tie

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel for use in hardened Portland cement concrete with tension, shear and pullout capacities appropriate for supported loads and building materials in which used. Subject to compliance with requirements, provide products by one of the following manufacturers:
   a. Cooper B-Line
   b. Hilti
   c. ITW Ramset/Red Head

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.

4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 Type suitable for attached structural element.

5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

6. Toggle Bolts: All-steel springhead type.


PART 3 - EXECUTION

3.1 APPLICATION

A. Conduit Crossing Structural Separation: Conduit that crosses structural or seismic separations between building units shall be installed with flexible connections suitable to accommodate longitudinal and transverse displacements. Secure raceways each side of joint and provide minimum of 36 inches length flexible conduit between building units.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC and RMC as required by NFPA 70. Minimum rod size shall be 3/8 inch in diameter.
C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2 inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lbs.

B. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. Wood: Fasten with lag screws or through bolts.
2. New Concrete: Bolt to concrete inserts.
3. Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. Existing Concrete: Expansion anchor fasteners. In lieu of expansion anchors, powder-acted driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete four inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than four inches thick.
5. Steel: Beam clamps.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers and other devices on slotted-channel racks attached to substrate.

C. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

3.3 CONCRETE BASES

A. Provide four-inch high concrete pads with chamfered edges for all floor-mounted equipment including switchboards, distribution panels, transformers, motor control centers and unit substations.

B. Construct concrete bases of dimension indicated but not less than four inches larger in both directions than supported unit, and so anchors will be a minimum of 10-bolt diameters from edge of the base.
C. Use 3000-psi, 28-day compressive-strength concrete.

D. Anchor equipment to concrete bases.

END OF SECTION
SECTION 26 05 33
RACEWAY AND BOXES

PART 1 - GENERAL

1.1 DEFINITIONS

A. EMT: Electrical metallic tubing
B. FMC: Flexible metal conduit
C. LFMC: Liquidtight flexible metal conduit
D. RMC: Rigid metal conduit
E. RNC: Rigid nonmetallic conduit
F. SMR: Surface Metal Raceway

1.2 SUBMITTALS

A. Product Data: Submit for each type of product provided.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

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

1. AFC Cable
2. Allied Tube
3. Electri-Flex

B. Rigid Metal Conduit (RMC):

1. General: Comply with ANSI C80.1.
2. Fittings:

   a. Couplings: Threaded metallic type of the same material as the conduit.
   b. Locknuts: Steel up to two inches, malleable iron for 2-1/2 inches and larger.
   c. Bushings: Bakelite or plastic up to two inches, malleable iron with insulating collar for 2-1/2 inches and larger.
e. Expansion Fittings: Steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, including flexible external bonding jumper.

C. Electrical Metallic Tubing (EMT):

1. General: Comply with ANSI C80.3.
2. Fittings:
   a. 1-1/2 inches and smaller: Steel compression type employing a split corrugated ring and tightening nut.
   b. Two inches and larger: Steel, set-screw-type containing dual set-screws on each side of coupling.
   c. Exterior: UL-Listed, raintight, steel, compression-type with silicon rubber internal sealing rings.
   d. Expansion Fittings: Steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

D. Flexible Metallic Conduit (FMC):

2. Fittings: Steel, one- or two-screw clamp type.

E. Liquid-Tight Flexible Metallic Conduit (LFMC):

2. Fittings: Galvanized steel, compression type.

2.2 NONMETALLIC CONDUIT AND TUBING

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

1. AFC Cable
2. Anamet
3. Electri-Flex
4. Carlon

B. Rigid Nonmetallic Conduit (RNC):

1. General: Comply with NEMA TC 2, Type EPC-40-PVC.
2. Fittings: Comply with NEMA TC 3; same material as the conduit.
3. Expansion Fittings: PVC to match conduit type, complying with UL 651, rated for environmental conditions where installed.

2.3 TELECOMMUNICATIONS OUTLET BOXES

A. Manufacturer: Randl Industries.
B. Description: 5” square width x 2.875” deep one piece pressed steel, electrogalvanized with cable management. Randl Industries #T-55057.

2.4 BOXES, ENCLOSURES AND CABINETS

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

1. Cooper Crouse-Hinds
2. EGS/Appleton Electric
3. Hoffman
4. Hubbell
5. RACO
6. Thomas & Betts
7. Wiremold

B. Small Sheet Metal Pull and Junction Boxes: Comply with NEMA OS 1.

C. Hinged-Cover Enclosures: NEMA 250, Type 1, steel, continuous-hinge cover with flush latch, finished inside and out with manufacturer's standard enamel.

D. Cabinets:

1. NEMA 250, Type 1, galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:

1. Exposed Conduit: RMC.
2. Concealed Conduit, Above Ground: RMC.
4. Connection to Vibrating Equipment (Including Transformers and Motor-Driven equipment): LFMC.
5. Boxes and Enclosures, Above Ground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed and Subject to Physical Damage: RMC. Includes raceways in the following locations:
   a. Loading docks.
   b. Corridors used for traffic of mechanized carts, forklifts and pallet-handling units.

3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
4. Existing Walls in Finished Areas: SMR.
5. Connection to Vibrating Equipment (Including Transformers and Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: RMC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 3R, in damp or wet locations.

C. Minimum Raceway Size:
   1. General: 3/4 inches unless otherwise indicated.
   2. Raceways with no more than three No. 12 AWG conductors shall be 1/2 inches unless otherwise indicated.

3.2 INSTALLATION

A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.

B. Raceways shall be concealed in finished areas. Where existing wall surfaces are inaccessible, surface metal raceways shall be provided. Raceways may be surface mounted in unfinished equipment spaces such as mechanical rooms, electrical rooms, elevator machine rooms and attic spaces.

C. Branch circuit raceways in telecommunication rooms shall be concealed within the wall.

D. Install exposed raceways as high as possible, above ductwork, parallel or at right angles to building lines.

E. Expansion and Seismic Joints:
   1. Raceways shall not be installed in concrete slab or wall construction when passing through an expansion or seismic joints.
   2. Raceways shall be installed in furred or suspended ceiling spaces with a minimum of 36 inches of flexible conduit crossing the expansion or seismic joints. Secure raceways each side of joint.

F. Raceways shall be installed parallel or at right angles to the building construction. This applies to all exposed raceways as well as all raceways above suspended ceiling.
G. Raceways shall not be run in floor slabs, under heavy equipment, footings or other structural elements that might adversely affect the integrity of the raceways system or building structure. Raceways installed above suspended ceilings shall be a minimum of six inches clear above top of ceiling system.

H. Raceways shall not be installed in floor slabs or structural columns.

I. Underground Metallic Raceways or Metallic Raceways in Contact with Concrete: Wrap raceway with .010-inch thick pipe-wrapping plastic tape applied with a 50 percent overlap (3M Scotchrap Tape 50).

J. Pullboxes with Covers: Provided as shown on the drawings and as required by the NEC. All pullboxes shall be accessible.

K. Exterior Walls: Conduits passing through exterior walls below grade and/or bridging an area which was previously excavated and backfilled shall be rigidly supported by a structurally reinforced concrete duct bank spanning between the building wall and a bearing surface on undisturbed earth.

L. Cleaning of Raceways: The interior and exterior of all conduits and other raceways shall be thoroughly cleaned of all material. All conduits shall be capped or plugged after installation.

M. Keep raceways at least six inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

N. Complete raceway installation before starting conductor installation.

O. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

P. Install no more than the equivalent of three 90-degrees bends in any conduit run except for communications conduits, for which fewer bends are allowed.

Q. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints.

R. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.

S. Provide pull strings in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

T. Install raceway sealing fittings at suitable, approved and accessible locations and fill them with listed sealing compound. Install each fitting for concealed raceways in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.

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2. Where otherwise required by NFPA 70.

U. Thermal Expansion Fittings

1. RNC: Install in each run of aboveground conduit that is located where environmental temperature change may exceed 30°F and that has straight-run length that exceeds 25 feet. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree Fahrenheit temperature change.

2. EMT and RMC: Install in each run of aboveground RMC and EMT conduit that is located where environmental temperature change may exceed 100°F and that has straight-run length that exceeds 100 feet. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per degree Fahrenheit temperature change for metal conduits.

3. Install expansion-joint fittings for each of the following locations and provide type and quantity of fittings that accommodate temperature change listed for location:

   a. Outdoor Locations Not Exposed to Direct Sunlight: 125 degrees F temperature change.
   b. Outdoor Locations Exposed to Direct Sunlight: 155 degrees F temperature change.
   c. Indoor Spaces: Connected with the outdoors without physical separation; 125 degrees F temperature change.
   d. Attics: 135 degrees F temperature change.
   e. Utility Tunnels: 155 degrees F temperature change.

4. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at the time of installation.

V. Flexible Conduit Connections: Use maximum of eight feet of flexible conduit for recessed and semirecessed lighting fixtures, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

   1. Use LFMC in damp or wet locations subject to severe physical damage.
   2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

W. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block and install box flush with surface of wall.

X. Set metal floor boxes level and flush with finished floor surface.

3.3 RACEWAYS AND CABLE INSTALLATION PATHWAYS FOR LOW-VOLTAGE SYSTEMS

A. Installation of Raceways/Pathways for low-voltage systems shall be in accordance with the applicable portions of ANSI/TIA-569-D, *Telecommunications Pathways and Spaces*. 

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B. Conduits above lay-in ceilings: Do not install cables in conduits that are supported from the ceiling suspension system. All conduits shall be supported independently of the ceiling support system.

C. Conduit fill shall not exceed 40 percent.

D. Bend radii for conduits shall meet the following requirements:
   1. If the conduit has an internal diameter of two inches or less, the bend radius must be at least six times the internal conduit diameter.
   2. If the conduit has an internal diameter of more than two inches, the bend radius must be at least 10 times the internal conduit diameter.

E. There shall be no more than two 90-degree bend between pull points in conduit, without derating of the conduit capacity. The conduit capacity shall be derated by 15 percent for each additional 90-degree bend. Increase conduit size as required to meet conduit fill requirements of this section and account for the derated capacity. Or, provide pull boxes to eliminate 90-degree bends as necessary to avoid having to derate conduit. Offsets shall be considered as equivalent to a 90-degree bend. Pull boxes added to conduit runs as of result of this requirement shall be in accordance with this section.

F. Conduits which are terminated at cable trays shall be supported from structure with a maximum distance of 24 inches from the tray. Conduits terminated at cable trays shall be bonded to the tray.

G. Exterior conduit shall be four inches Schedule 40 PVC with GRC elbows transitioning to four inches GRS for Service Entrances. Interior conduit for vertical riser cable shall be GRC, sized according to ANSI/TIA-569-D or as indicated on the Contract Drawings. Interior conduit for horizontal cable shall be EMT, sized according to ANSI/TIA-569-D standards or as indicated on the Contract Drawings.

H. Flexible conduit for telecommunications shall only be used in lengths not exceeding four feet, without prior written approval. If used, flexible metal conduit shall be increased by one trade size for the application used.

I. Conduits entering telecommunication rooms through the floor shall be terminated four inches above the finished floor. Conduits entering the rooms from above shall be terminated four inches below the finished ceiling. In no case shall the conduits terminate greater than 12 inches above the cable tray or distribution frame.

J. Conduits and cut-out openings between floors shall be sealed with removable and reusable firestopping material, to accommodate adds, moves and changes in the cabling system.

K. Conduits used for routing of low voltage cables shall have bushings at all stubouts.
3.4 INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit.
2. Backfill shall be imported structure fill or imported gravel borrow according to WSDOT standards.
3. After installing conduit, backfill and compact. Start at tie-in point and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.
4. Elbows: All elbows shall be RMC.
   a. Wrapped elbows with 3M Scotchrap Tape 50.
   b. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with three inches of concrete.
   c. Extend steel conduit horizontally a minimum of 60 inches from edge of equipment pad or foundation for stub-ups at equipment mounted on outdoor concrete bases.
   d. Install insulated grounding bushings on terminations at equipment.

3.5 SLEEVE-SEAL INSTALLATION

A. Install to seal underground exterior wall penetrations.

B. Use type and number of sealing elements recommended by manufacturer for raceway material and size. Position raceway in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.6 FIRESTOPPING

A. Provide firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.7 SOUND CONTROL

A. General: The installation of the outlet boxes and conduit shall utilize installation methods which minimize sound transmission from one room to adjacent room or areas boxes shall not be located within 24 inches of each other or within the same study cavity.
B. Installation:

1. Boxes mounted in a common wall shall be offset horizontally whenever possible so that they are not mounted back-to-back. Connect offset boxes with flexible conduit not to exceed 24 inches in length.

2. Boxes may be mounted back-to-back (with permission) where it is not practical to offset, with a minimum clearance of 1/4" inch between boxes. Wrap both boxes with STI putty pads. Connect boxes with flexible conduit. Do not nipple boxes mounted back-to-back.

END OF SECTION
SECTION 26 05 43
UNDERGROUND DUCTS AND RACEWAYS

PART 1 - GENERAL

1.1 DEFINITION

A. RNC: Rigid nonmetallic conduit.
B. RSC: Rigid Steel Conduit.

1.2 SUBMITTALS

A. Product Data: Submit for each type of product provided.

1.3 COORDINATION

A. Coordinate layout and installation of ducts, vaults, handholes and boxes with final arrangement of other utilities, site grading and surface features as determined in the field.

B. Coordinate elevations of ducts and duct-bank entrances into vaults, handholes and boxes with final locations and profiles of ducts and duct banks as determined by coordination with other utilities, underground obstructions and surface features. Revise locations and elevations from those indicated as required to suit field conditions and to ensure that duct runs drain to manholes and handholes.

PART 2 - PRODUCTS

2.1 UNDERGROUND DUCTS

B. Rigid Nonmetallic Conduit (RNC): TC2, Type EPC-40 PCV, unless otherwise indicated.

2.2 DUCT SEPARATORS

A. Factory-fabricated rigid PVC interlocking spacers, sized for type and sizes of ducts with which used, and selected to provide minimum duct spacing's indicated while supporting ducts during concreting or backfilling.
2.3 WARNING TAPE

A. Underground-line warning tape specified in Section 260553-Identification.

2.4 INNERDUCT

A. Manufacturer: MaxCell "Detectable" series

B. Description: Three 1.25 inch ducts with integral 18-gauge solid copper core tracer wire.

2.5 PRECAST CONCRETE VAULTS/MANHOLES/HANDHOLES

A. Manufacturer: Utility Vault Co.

B. Comply with ASTM C 858 for design and manufacturing processes.

C. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.

D. Frame and Cover: Weatherproof steel frame with hinged steel access door assembly with tamper-resistant, captive, cover-securing bolts.
   1. Cover Hinges: Concealed with hold-open ratchet assembly.
   2. Cover Handle: Recessed.

E. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

F. Cover Legend: Provide welded steel nameplate identifying the system within as follows:
   1. Power: "POWER"
   2. Lighting: "LIGHTING"
   3. Telephone: "TELEPHONE"
   4. Cable Television: "CABLE"
   5. All other low-voltage systems: "SIGNAL"

G. Configuration: Units shall be designed for flush burial and have integral closed bottom, unless otherwise indicated.

H. Windows: Precast openings in walls, arranged to match dimensions and elevations of approaching ducts and duct banks plus an additional 12 inches vertically and horizontally to accommodate alignment variations.
   1. Windows shall be located no less than six inches from interior surfaces of walls, floors, or frames and covers of handholes, but close enough to corners to facilitate racking of cables on walls.
2. Window opening shall have cast-in-place, welded wire fabric reinforcement for field cutting and bending to tie in to concrete envelopes of duct banks.

3. Window openings shall be framed with at least two additional No. 4 steel reinforcing bars in concrete around each opening.

I. Duct Entrances in Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

1. Type and size shall match fittings to duct or conduit to be terminated.

2. Fittings shall align with elevations of approaching ducts and be located near interior corners of handholes to facilitate racking of cable.

2.6 HANDHOLES (OTHER THAN PRECAST CONCRETE)

A. Manufacturer: Hubbell "Quazite" series.

B. Description: Fiberglass handles and boxes with polymer concrete frame and cover shall be sheet-molded, fiberglass-reinforced, polyester resin enclosure joined to polymer concrete top ring or frame.

C. Configuration: Units shall be designed for flush burial and have integral closed bottom, unless otherwise indicated.

D. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.

E. Cover Finish: Nonskid finish.

F. Cover Legend: Molded lettering describing the system contained within as follows:

1. Power: "POWER"

2. Lighting: "LIGHTING"

3. Telephone: "TELEPHONE"

4. Cable Television: "CABLE"

5. All other low-voltage systems: "SIGNAL"

2.7 SEALING PRODUCTS

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

1. Duct Plugs: Tyco Electronics, "Jackmoon" plugs.

2. Foam Sealant: TODAL Products Duo Dill 400.
2.8 TAMPERPROOF HARDWARE
A. Provide stainless steel tamperproof bolts to secure all vault, manhole and handhole covers. Verify bolt type with Owner.

2.9 ELBOWS
A. RSC: C Wrapped with 3M Scotchrap Tape 50

PART 3 - EXECUTION

3.1 UNDERGROUND DUCT APPLICATION
A. Ducts for Electrical Feeders 600 Volt and Less: RNC, NEMA Type EPC-40-PVC, direct-buried, unless otherwise indicated. Provide RSCelbows.
B. Ducts for Electrical Branch Circuits: RNC, NEMA Type EPC-40-PVC, direct-buried unless otherwise indicated.
C. Ducts for Low-Voltage Cabling: RNC, NEMA Type EPC-40-PVC, direct-buried unless otherwise indicated. Provide RSCelbows.

3.2 UNDERGROUND ENCLOSURE APPLICATION
A. Handholes:
   1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete. AASHTO HB 17, H-20 structural load rating.
   2. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Heavy-duty fiberglass units with polymer concrete frame and cover, SCTE 77, Tier 8 structural load rating.
B. Precast Concrete Vaults/Manholes: H-20 structural load rating according to AASHTO HB 17.

3.3 EARTHWORK
A. Backfill: Utilize imported structural fill or gravel borrow per WSDOT standards.
B. Compact backfill but do not use heavy-duty, hydraulic-operated, compaction equipment.
C. Restore surface features at areas disturbed by excavation and reestablish original grades, unless otherwise indicated. Replace removed sod immediately after backfilling is completed.
3.4 DUCT INSTALLATION

A. Slope: Pitch ducts a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope ducts from a high point in runs between two manholes to drain in both directions.

B. Curves and Bends: Use five-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations, unless otherwise indicated.

C. Joints: Use solvent-cemented joints in ducts and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.

D. Duct Entrances to Vaults and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for five-inch ducts, and vary proportionately for other duct sizes.

1. Begin change from regular spacing to end-bell spacing 10 feet from the end bell without reducing duct line slope and without forming a trap in the line.
2. Direct-Buried Duct Banks: Install an expansion and deflection fitting in each conduit in the area of disturbed earth adjacent to manhole or handhole.
3. Grout end bells into structure walls from both sides to provide watertight entrances.

E. Sealing: Provide temporary closure at terminations of ducts that have cables pulled. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15-psig (1.03-MPa) hydrostatic pressure.

F. Pulling Cord: Install 100lbf-test nylon cord in ducts, including spares.

G. Concrete-Encased Ducts:

1. Support ducts on separators coordinated with duct size, duct spacing and outdoor temperature.
2. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts with not less than four spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent floating during concreting. Stagger separators approximately six inches between tiers. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
3. Concreting Sequence: Pour each run of envelope between manholes or other terminations in one continuous operation.
a. Start at one end and finish at the other, allowing for expansion and contraction of ducts as their temperature changes during and after the pour. Use expansion fittings installed according to manufacturer's written recommendations, or use other specific measures to prevent expansion-contraction damage.

b. If more than one pour is necessary, terminate each pour in a vertical plane and install 3/4-inch reinforcing rod dowels extending 18 inches into concrete on both sides of joint near corners of envelope.

4. Pouring Concrete: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not allow a heavy mass of concrete to fall directly onto ducts. Use a plank to direct concrete down sides of bank assembly to trench bottom. Allow concrete to flow to center of bank and rise up in middle, uniformly filling all open spaces. Do not use power-driven agitating equipment unless specifically designed for duct-bank application.

5. Reinforcement: Reinforce concrete-encased duct banks where they cross disturbed earth and where indicated. Arrange reinforcing rods and ties without forming conductive or magnetic loops around ducts or duct groups.

6. Forms: Use walls of trench to form side walls of duct bank where soil is self-supporting and concrete envelope can be poured without soil inclusions; otherwise, use forms.

7. Minimum Space between Ducts: Three inches between ducts and exterior envelope wall, two inches between ducts for like services, and four inches between power and signal ducts.

8. Depth: Install top of duct bank at least 24 inches below finished grade in areas not subject to deliberate traffic, and at least 30 inches below finished grade in deliberate traffic paths for vehicles, unless otherwise indicated.

9. Stub-Ups: Use manufactured rigid-steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.

a. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with three inches of concrete.

b. Stub-Ups to Equipment: For equipment mounted on outdoor concrete bases, extend steel conduit horizontally a minimum of 60 inches from edge of base. Install insulated grounding bushings on terminations at equipment.

H. Direct-Buried Duct Banks:

1. Support ducts on separators coordinated with duct size, duct spacing and outdoor temperature.

2. Space separators close enough to prevent sagging and deforming of ducts with not less than four spacers per 20 feet of duct. Secure separators to earth and to ducts to prevent displacement during backfill and yet permit linear duct movement due to expansion and contraction as temperature changes. Stagger separators approximately six inches between tiers.

3. Excavate trench bottom to provide firm and uniform support for duct bank.

4. After installing first tier of ducts, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat
procedure after placing each tier. After placing last tier, hand-place backfill to four inches over ducts and hand tamp. Firmly hand tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction.

5. Install ducts with a minimum of three inches between ducts for like services and six inches between power and signal ducts.

6. Depth: Install top of duct bank at least 36 inches below finished grade, unless otherwise indicated.

7. Set elevation of bottom of duct bank below the frost line.

8. Install manufactured rigid steel conduit elbows for stub-ups at poles and equipment and at building entrances through the floor.
   a. Couple steel conduits to ducts with adapters designed for this purpose and encase coupling with three inches of concrete.
   b. Stub-Ups to Equipment: Extend steel conduit horizontally a minimum of 60 inches from edge of base, for equipment mounted on outdoor concrete bases. Install insulated grounding bushings on terminations at equipment.

I. Warning Tape: Bury warning tape approximately 12 inches above all concrete-encased ducts and duct banks. Align tape parallel to and within three inches of the centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

J. Innerduct: Provide Maxcell innerduct (three 1.25" innerducts) in every 4" duct being used for low-voltage cabling.

3.5 INSTALLATION OF PRECAST CONCRETE VAULTS, MANHOLES AND HANDHOLES

A. General:
   1. Comply with ASTM C 891, unless otherwise indicated.
   2. Install units level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances.
   3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from one-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

B. Elevations:
   1. Manhole Roof: Install with rooftop at least 15 inches below finished grade.
   2. Manhole Frame: In paved areas and trafficways, set frames flush with finished grade. Set other manhole frames one inch above finished grade.
   3. Install vaults with bottom below the frost line below grade.
   4. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes one inch above finished grade.
5. Where indicated, cast handhole cover frame integrally with handhole structure.

C. Waterproofing: Apply waterproofing to exterior surfaces.

### 3.6 INSTALLATION OF HANDHOLES (OTHER THAN PRECAST CONCRETE)

A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting ducts to minimize bends and deflections required for proper entrances. Use box extension if required to match depths of ducts, and seal joint between box and extension as recommended by the manufacturer.

B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

C. Elevation: In paved areas and trafficways, set so cover surface will be flush with finished grade. Set covers of other handholes one inch above finished grade.

D. Install handholes and boxes with bottom below the frost line below grade.

E. Field-cut openings for ducts and conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

### 3.7 GROUNDING

A. Ground underground ducts, vaults, manholes, handholes and utility structures according to Section 260526-Grounding and Bonding.

### 3.8 SEALING

A. Vaults and Manholes:

1. Provide blank duct plugs in all space ducts.
2. Provide "Jack Moon" plugs for ducts that have cables installed.

B. Handholes: Seal all ducts with two-part urethane foam sealant.

C. Ducts terminating within Building: Seal all ducts with two-part urethane foam sealant.

### 3.9 DRAINS

A. Provide two-inch drainline from each vault and manhole to nearest catch basin which is at a lower elevation than the bottom of the vault. Slope drain to catch basin.

END OF SECTION

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PART 1 - GENERAL

1.1 DEFINITIONS

1.2 SUBMITTALS
A. Product Data: Submit for each type of product provided.

1.3 PERFORMANCE REQUIREMENTS
A. Provide complete seismic anchorage and bracing for all electrical raceways, cable trays, fixtures and equipment as required by the International Building Code (IBC) Section 1621.
B. Retain the services of a professional licensed structural engineer to design the required seismic anchorage and bracing.
C. Seismic-Restraint Loading:
   1. Site Class as Defined in the IBC: D.
   2. Assigned Seismic Use Group or Building Category as Defined in the IBC: B.
      a. Component Importance Factor: 1.5 for essential systems, 1.0 for nonessential systems.
      b. Component Response Modification Factor: 5.0.
      c. Component Amplification Factor: 2.5.
   3. Design Spectral Response Acceleration at 1.0-Second Period.
   4. Essential Systems: The following electrical equipment, raceways and spaces are considered essential for the continued operation of the facility:
      a. All electrical, generator and communications rooms.
      b. All life-safety distribution equipment, feeders and raceways.
      c. All equipment and feeders rated 225 amperes and above.
      d. All fire alarm system equipment and raceways.
PRODUCTS

1.4 VIBRATION ISOLATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Isolation Technology, Inc.
   2. Vibration Isolation

B. Pads: Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.

C. Resilient Material: Oil and water-resistant neoprene.

D. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
   1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
   5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch-thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig.
   6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

E. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
   1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch-thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
   2. Restraint: Seismic or limit-stop as required for equipment and Authorities Having Jurisdiction.
   3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
1.5 SEISMIC-RESTRAINT DEVICES

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

1. Cooper B-Line
2. Hilti Inc.
3. TOLCO Incorporated
4. Unistrut

B. General Requirements for Restraint Components: Rated strengths, features and application requirements shall be as defined in reports by an agency acceptable to Authorities Having Jurisdiction.

C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression and torsion forces.

D. Restraint Cables: ASTM A 603 galvanized-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod. Do not weld stiffeners to rods.

F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.

G. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.

PART 2 - EXECUTION

2.1 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to Authorities Having Jurisdiction.

B. Hanger Rod Stiffeners: Install hanger rod stiffeners where required to prevent buckling of hanger rods due to seismic forces.
C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

2.2 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Equipment and Hanger Restraints:
   1. Install restrained isolators on electrical equipment.
   2. Install seismic-restraint devices using methods approved by an agency acceptable to Authorities Having Jurisdiction providing required submittals for component.

B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

D. Drilled-in Anchors:
   1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit and gas lines.
   2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
   3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
   4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
   5. Set anchors to manufacturer’s recommended torque, using a torque wrench.
   6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

2.3 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.
2.4 ADJUSTING

A. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

B. Adjust active height of spring isolators.

C. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION
PART 1 - GENERAL

1.1 SUBMITTALS
   A. Product Data: Submit for each type of product provided.

PART 2 - PRODUCTS

2.1 RACEWAY IDENTIFICATION MATERIALS
   A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway and cable size.
   B. Color for Printed Legend:
      3. Other Low-Voltage Systems: White letters on a black field.
   C. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
   D. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant two inches wide and compounded for outdoor use.

2.2 FASTENERS FOR LABELS AND SIGNS
   A. Stainless steel machine screws with nuts and flat and lock washers in outdoor locations, and contact-type permanent self adhesive in indoor locations.

2.3 CONTROL AND COMMUNICATIONS CABLELING AND CONDUCTORS
   A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than three mils thick by one to two inches wide.
   B. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type with circuit identification legend machine printed by thermal transfer or equivalent process.
C. Write-On Tags: Polyester tag, 0.015 inch thick with corrosion-resistant grommet and polyester or nylon tie for attachment to conductor or cable. Uses permanent, waterproof, black ink marker recommended by tag manufacturer.

2.4 UNDERGROUND-LINE WARNING TAPE

A. Description: Permanent, bright-colored, continuous-printed polyethylene tape.
   1. Compounded for permanent direct-burial service.
   2. Embedded continuous metallic strip or core.
   3. Printed legend shall indicate type of underground line.

2.5 WARNING LABELS AND SIGNS


B. Self-Adhesive Warning Labels: Factory printed, multicor, pressure-sensitive adhesive labels configured for display on front cover, door or other access to equipment, unless otherwise indicated.

2.6 EQUIPMENT NAMEPLATES

A. General: Nameplates shall be 1/16" thick laminated plastic with engraved letters.

B. Color for Nameplates:
   1. Lighting and Power: White letters on a black field.
   2. Fire Alarm: White letters on a red field.
   4. Other Low-Voltage Systems: White letters on a black field.

2.7 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.
   2. Tensile Strength: 50 lb, minimum.
   3. Temperature Range: -40 to +185 degrees Fahrenheit.

PART 3 - EXECUTION
3.1 APPLICATION

A. Equipment with Multiple Power Sources: Provide label that reads: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."

B. Accessible Raceways More Than 600 Volt: Identify with "DANGER: HIGH-VOLTAGE" in black letters at least two inches high with self-adhesive vinyl labels. Repeat legend at 10-foot maximum intervals.

C. Power-Circuit Conductor Identification: Use color-coding conductor tape for conductors No. 1/0 AWG and larger in vaults, pull and junction boxes, vaults and handholes. Identify source and circuit number of each set of conductors. Identify phase in addition to the above for single conductor cables.

D. Branch-Circuit Conductor Identification: Use marker tape where there are conductors for more than three branch circuits in same junction or pull box. Identify each ungrounded conductor according to source and circuit number.

E. Conductors to be Extended in the Future: Attach write-on tags to conductors and list source and circuit number.

F. Auxiliary Electrical Systems Conductor Identification: Identify all control and low-voltage systems wiring as follows:
   1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals and pull points. Identify by system and circuit designation.
   2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
   3. Coordinate identification with manufacturer's shop drawings.

G. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable. Install underground-line warning tape for both direct-buried cables and cables in raceway.

H. Equipment Identification Labels:
   1. Switchboards and Distribution Panelboards: Provide nameplate that identifies the switchboard/distribution panel and the source panel. (Example: Distribution Panel No. 1/Fed from Main Service Switchboard - Bkr. No. 1.) Provide nameplate at each overcurrent device that identifies the device number and the load served. (Example: Bkr. No. 1/Panel A)
   2. Panelboards: Provide nameplate on the front of the panel cover that identifies the panel. (Example: Panel A.) Provide a nameplate concealed behind the door which identifies the panel and the source panel. (Example: Panel A, fed from Distribution Panel 1-Bkr. No. 2)
   3. Transformers: Provide nameplate identifying the transformer, the source panel and the panel served. (Example: Transformer T1/fed from Distribution Panel 1, Bkr. No. 1/Serves Panel A)
4. Disconnect Switches and Enclosed Controllers: Provide nameplate that identifies the source panel and load served. (Example: Panel A-1, 3, 5/Exhaust Fan No.1)

5. Variable Frequency Drives: Provide nameplate which identifies the source panel and load served. (Example: Panel A-1, 3, 5/Exhaust Fan No. 1)

I. Device Plates: Laser-engage according to Section 26276-Wiring Devices.

J. Junction and Pull Box Identification: Mark the cover of all junction boxes and pull boxes to identify the system, circuits, or feeders contained within the box. Circuits shall be identified by the panel and specific circuit numbers contained within the box.

1. Boxes containing fire alarm conductors shall be painted red.
2. Boxes containing emergency system conductors shall be painted orange.

K. Color-Coding for Phase and Voltage Level Identification, 600 Volt and Less: Use the colors listed below for ungrounded conductors:

1. Colors for 208/120-Volt Circuits:
   a. Phase A: Black
   b. Phase B: Red
   c. Phase C: Blue
   d. Neutral: White
   e. Ground: Green
   f. Travelers: Yellow

2. Colors for 480/277-Volt Circuits:
   a. Phase A: Brown
   b. Phase B: Orange
   c. Phase C: Yellow
   d. Neutral: Gray
   e. Ground: Green
   f. Travelers: Lavender

3. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of six inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

L. Arc Flash Hazard Labels:

1. Provide label on all distribution equipment that designates the appropriate PPE (Personal Protective Equipment) required for the hazard present. Labels to comply with the NEC and NFPA 70E. Submit sample of label to Engineer for review.

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3.2 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.

C. Apply identification devices to surfaces that require finish after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before application using materials and methods recommended by manufacturer of identification device.

E. Attach nonadhesive signs and plastic labels with screws and auxiliary hardware appropriate to the location and substrate.

F. System Identification Color Banding for Raceways and Cables: Each color band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at six to eight inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

END OF SECTION
SECTION 26 05 73

OVERCURRENT PROTECTIVE DEVICE COORDINATION STUDY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 specification sections, apply to this section.

1.2 SUMMARY

A. This section includes computer-based, fault-current and overcurrent protective device coordination studies for all new and existing devices. Protective devices shall be set based on results of the protective device coordination study.

B. This study also includes:

1. An arc flash hazard analysis.
2. Providing self-adhesive arc flash hazard labels.

C. Provide an initial study and submit with the electrical gear submittals.

D. Provide a final study prior to substantial completion. The final study shall include all changes made during construction.

1.3 SUBMITTALS

A. Product Data: Submit for computer software program to be used for studies.

B. Product Certificates: Submit for coordination-study and fault-current-study computer software programs to certify compliance with IEEE 399.

C. Other Action Submittals: The following submittals shall be made after the approval process for system protective devices has been completed.

1. Coordination-study input data, including completed computer program input data sheets.
2. Study and Equipment Evaluation Reports.
1.4 QUALITY ASSURANCE

A. Studies shall use computer programs that are distributed nationally and are in wide use. Software algorithms shall comply with requirements of standards and guides specified in this section. Manual calculations are not acceptable.

B. Coordination-Study Specialist Qualifications: An entity experienced in the application of computer software used for studies, having performed successful studies of similar magnitude on electrical distribution systems using similar devices. Professional engineer, licensed in the state where project is located, shall be responsible for the study. All elements of the study shall be performed under the direct supervision and control of engineer.

C. Comply with IEEE 242 for short-circuit currents and coordination time intervals.

D. Comply with IEEE 399 for general study procedures.

PART 2 - PRODUCTS

2.1 COMPUTER SOFTWARE DEVELOPERS

A. Available Computer Software Developers: Subject to compliance with requirements, companies offering computer software programs that may be used in the Work include, but are not limited to, the following:

1. Power Analytics
2. EDSA Micro Corporation
3. ESA Inc.
4. Operation Technology, Inc.
5. SKM Systems Analysis, Inc.

2.2 COMPUTER SOFTWARE PROGRAM REQUIREMENTS

A. Comply with IEEE 399.

B. Analytical features of fault-current-study computer software program shall include "mandatory," "very desirable," and "desirable" features as listed in IEEE 399.

C. Computer software program shall be capable of plotting and diagramming time-current-characteristic curves as part of its output. Computer software program shall report device settings and ratings of all overcurrent protective devices and shall demonstrate selective coordination by computer-generated, time-current coordination plots.
PART 3 - EXECUTION

3.1 GENERAL

A. Examine project overcurrent protective device submittals for compliance with electrical distribution system coordination requirements and other conditions affecting performance.

B. Existing Devices: Field verify data for all existing devices.

C. Existing Feeders: Field verify conductor and raceway data for all existing feeders.

3.2 POWER SYSTEM DATA

A. Gather and tabulate the following input data to support coordination study:

1. Product data for overcurrent protective devices specified in other Division 26 sections and involved in overcurrent protective device coordination studies. Use equipment designation tags that are consistent with electrical distribution system diagrams, overcurrent protective device submittals, input and output data, and recommended device settings.

2. Impedance of utility service entrance.

3. Electrical Distribution System Diagram: In hard-copy and electronic-copy formats, showing the following:
   a. Circuit-breaker and fuse-current ratings and types.
   b. Relays and associated power and current transformer ratings and ratios.
   c. Transformer kilovolt amperes, primary and secondary voltages, connection type, impedance, and X/R ratios.
   d. Cables: Indicate conduit material, sizes of conductors, conductor material, insulation, and length.
   e. Motor horsepower and code letter designation according to NEMA MG 1.

4. Data sheets to supplement electrical distribution system diagram, cross-referenced with tag numbers on diagram, showing the following:
   a. Special load considerations, including starting inrush currents and frequent starting and stopping.
   b. Transformer characteristics, including primary protective device, magnetic inrush current, and overload capability.
   c. Motor full-load current, locked rotor current, service factor, starting time, type of start, and thermal-damage curve.
   d. Ratings, types, and settings of utility company's overcurrent protective devices.
   e. Special overcurrent protective device settings or types stipulated by utility company.
f. Time-current-characteristic curves of devices indicated to be coordinated.
g. Manufacturer, frame size, interrupting rating in amperes rms symmetrical, ampere or current sensor rating, long-time adjustment range, short-time adjustment range, and instantaneous adjustment range for circuit breakers.
h. Manufacturer and type, ampere-tap adjustment range, time-delay adjustment range, instantaneous attachment adjustment range, and current transformer ratio for overcurrent relays.
i. Panelboards, switchboards, motor-control center ampacity, and interrupting rating in amperes rms symmetrical.

3.3 FAULT-CURRENT STUDY

A. Calculate the maximum available short-circuit current in amperes rms symmetrical at circuit-breaker positions of the electrical power distribution system. The calculation shall be for a current immediately after initiation and for a three-phase bolted short circuit at each of the following:

1. Switchgear and switchboard bus
2. Motor-control center
3. Distribution panelboard
4. Branch circuit panelboard

B. Study electrical distribution system from normal and alternate power sources throughout electrical distribution system for project. Include studies of system-switching configurations and alternate operations that could result in maximum fault conditions.

C. Calculate momentary and interrupting duties on the basis of maximum available fault current. Show interrupting (five-cycle) and time-delayed currents (six cycles and above) on medium-voltage breakers as needed to set relays and assess the sensitivity of overcurrent relays.

D. Equipment Evaluation Report:

1. 600-Volt Overcurrent Protective Devices: Ensure that interrupting ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.
2. Devices and Equipment Rated for Asymmetrical Fault Current: Apply multiplication factors listed in the standards to 1/2-cycle symmetrical fault current.
3. Verify adequacy of phase conductors at maximum three-phase bolted fault currents; verify adequacy of equipment grounding conductors and grounding electrode conductors at maximum ground-fault currents. Ensure that short-circuit withstand ratings are equal to or higher than calculated 1/2-cycle symmetrical fault current.

3.4 COORDINATION STUDY

1. Calculate the maximum and minimum 1/2-cycle short-circuit currents.
2. Calculate the maximum and minimum interrupting duty (five cycles to two seconds) short-circuit currents.
3. Calculate the maximum and minimum ground-fault currents.

B. Transformer Primary Overcurrent Protective Devices:

1. Device shall not operate in response to the following:
   
a. Inrush current when first energized.
   
b. Self-cooled, full-load current or forced-air-cooled, full-load current, whichever is specified for that transformer.
   
c. Permissible transformer overloads according to IEEE C57.96 if required by unusual loading or emergency conditions.

2. Device settings shall protect transformers according to IEEE C57.12.00 for fault currents.

C. Conductor Protection: Protect cables against damage from fault currents according to ICEA P-32-382, ICEA P-45-482, and conductor melting curves in IEEE 242.

Demonstrate that equipment withstands the maximum short-circuit current for a time equivalent to the tripping time of the primary relay protection or total clearing time of the fuse. To determine temperatures that damage insulation, use curves from cable manufacturers or from listed standards indicating conductor size and short-circuit current.

D. Coordination-Study Report: Prepare a written report indicating the following results of coordination study:

1. Tabular Format of Settings Selected for Overcurrent Protective Devices:
   
a. Device tag
   
b. Relay-current transformer ratios; and tap, time-dial, and instantaneous-pickup values
   
c. Circuit-breaker sensor rating; and long-time, short-time, and instantaneous settings
   
d. Fuse-current rating and type
   
e. Ground-fault relay-pickup and time-delay settings

2. Coordination Curves: Prepared to determine settings of overcurrent protective devices to achieve selective coordination. Graphically illustrate that adequate time separation exists between devices installed in series, including power utility company's upstream devices. Prepare separate sets of curves for the switching schemes and for emergency periods where the power source is local generation. Show the following information:
   
a. Device tag
   
b. Voltage and current ratio for curves
   
c. Three-phase and single-phase damage points for each transformer
   
d. No damage, melting, and clearing curves for fuses
e. Cable damage curves
f. Transformer inrush points
g. Maximum fault-current cutoff point

E. Completed data sheets for setting of overcurrent protective devices.

3.5 ARC FLASH HAZARD ANALYSIS

A. Calculate the arc flash hazard category, the incident energy level and the flash hazard boundary for all electrical equipment.

B. Provide self-adhesive labels complying with ANSI Standards Z535.4-1998.

END OF SECTION
PART 1 - GENERAL

1.1 DEFINITIONS
   A. LED: Light-emitting diode.
   B. PIR: Passive infrared.

1.2 SUBMITTALS
   A. Product Data: Submit for each type of product provided.

1.3 COORDINATION
   A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression system, and partition assemblies.

PART 2 - PRODUCTS

2.1 OCCUPANCY SENSORS
   A. Manufacturer: Subject to compliance with requirements, provide products by Wattstopper.
   B. Occupancy Sensor Switches:
      1. Toilet Rooms: Wattstopper UW-100 for controlling one circuit; Wattstopper UW-200 for controlling two circuits.
      2. All Other Rooms: Wattstopper PW-100 series.

2.2 TIME CLOCKS
   A. Manufacturers: Subject to compliance with requirements, provide products by Intermatic.
B. **Electronic Time Clocks**: Electronic, solid-state programmable units with alphanumeric display; complying with UL 917.
   1. **Contact Rating**: 30-A inductive or resistive, 240-volt ac.
   2. **Program**: Two on-off set points on a 24-hour schedule, allowing different set points for each day of the week and an annual holiday schedule that overrides the weekly operation on holidays.
   3. **Circuitry**: Allow connection of a photoelectric relay as substitute for on-off function of a program on selected channels.
   4. **Astronomic Time**: All channels.
   5. **Battery backup is required for schedules and time clock.**

### 2.3 LIGHTING CONTACTORS

A. **Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
   1. Square D
   2. Siemens
   3. General Electric

B. **Description**: Electrically operated and electrically held.
   1. **Current Rating for Switching**: Listing or rating consistent with type of load served, 30-amp minimum, including tungsten filament, inductive, and high-inrush ballast (ballast with 15 percent or less total harmonic distortion of normal load current).
   2. **Fault Current Withstand Rating**: Equal to or exceeding the available fault current at the point of installation.
   3. **Enclosure**: Comply with NEMA 250.
   4. **Provide control power transformer, red pilot light and H-O-A switch matching the NEMA type specified for the enclosure.**

### 2.4 CONDUCTORS AND CABLES

A. **Power Wiring to Supply Side of Remote-Control Power Sources**: Not smaller than No. 12 AWG. Comply with requirements in Division 26, Section 260519, "General Low-Voltage Electrical Power."

B. **Classes 2 and 3 Control Cable**: Multiconductor cable with stranded-copper conductors not smaller than No. 18 AWG. Comply with requirements in Division 26, Section 260519, "General Low-Voltage Electrical Power."

C. **Class 1 Control Cable**: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Division 26, Section 260519, "General Low-Voltage Electrical Power."
PART 3 - EXECUTION

3.1 SENSOR INSTALLATION
   
   A. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION
   
   A. Wiring Method: Comply with Section 260519-General Low-Voltage Electrical Power.

   B. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

   C. Size conductors according to lighting control device manufacturer's written instructions, unless otherwise indicated.

   D. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION
   
   A. Identify components and power and control wiring according to Section 260553-Identification. Provide phenolic nameplate on the cover of each lighting contactor enclosure that identifies the circuits controlled and areas served.

3.4 Installed Spare Devices
   
   A. Provide the following spare occupancy sensors including associated raceways and wiring:

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occupancy Sensor Switches</td>
<td>1</td>
</tr>
</tbody>
</table>

   B. Spare devices shall include 75 feet of conduit, faceplates, all require wire, cutting, patching and painting for a complete installation. Location of these units is to be determined by the Owner's representative at the site. The Contractor shall assume that these devices will be installed after all other work is completed. Installation shall occur on an accelerated (night/weekend) schedule. Unused devices are to be turned over to the Owner.

END OF SECTION

09/30/19
SECTION 26 22 00
LOW-VOLTAGE TRANSFORMERS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Product Data: Submit for each type of transformer provided.

1.2 DELIVERY, STORAGE AND HANDLING

A. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Square D
2. General Electric
3. Siemens
4. Tierney

B. The basis of design manufacturer for this project is Square D to establish the minimum standards for quality and performance. Other manufacturers are acceptable only if:

1. The equipment is from one of the manufacturers listed above.
2. The equipment quality and performance is equal to the Basis of Design.
3. The equipment dimensions are equal to or smaller than the Basis of Design.

2.2 GENERAL TRANSFORMER REQUIREMENTS

A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.

B. Cores: Grain-oriented, non-aging silicon steel.

C. Coils: Continuous windings without splices except for taps.
1. Internal Coil Connections: Brazed or pressure type.
2. Coil Material: Copper.

2.3 DISTRIBUTION TRANSFORMERS

A. Comply with NEMA ST 20, and list and label as complying with UL 1561.

B. Provide transformers that are constructed to withstand seismic forces specified in Division 26, "Vibration and Seismic Controls."

C. Cores: One leg per phase.

D. Enclosure: Ventilated, NEMA 250, Type 2. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.

E. Taps for Transformers Smaller Than 3 kVA: One five-percent tap above normal full capacity.

F. Taps for Transformers 7.5 to 24 kVA: One five-percent tap above and one five percent tap below normal full capacity.

G. Taps for Transformers 25 kVA and Larger: Two 2.5-percent taps above and four 2.5-percent taps below normal full capacity.

H. Insulation Class: 220 degree C, UL-component-recognized insulation system with a maximum of 150 degree C rise above 40 degree C ambient temperature.

I. Energy Efficiency for Transformers Rated 15 kVA and Larger: Complying with NEMA TP 1, Class 1 efficiency levels.

J. K-Factor Rating: Transformers indicated to be K-factor rated and comply with UL 1561 requirements for nonsinusoidal load current-handling capability to the degree defined by designated K-factor. Unit shall not overheat when carrying full-load current with harmonic distortion corresponding to designated K-factor.

K. Electrostatic Shielding: Each winding shall have an independent, single, full-width copper electrostatic shield arranged to minimize interwinding capacitance.
   1. Arrange coil leads and terminal strips to minimize capacitive coupling between input and output terminals.
   2. Include special terminal for grounding the shield.
   3. Shield Effectiveness:
      a. Capacitance between Primary and Secondary Windings: Not to exceed 33 picofarads over a frequency range of 20 Hz to 1 MHz.
      b. Common-Mode Noise Attenuation: Minimum of minus 120 dBA at 0.5 to 1.5 kHz; minimum of minus 65 dBA at 1.5 to 100 kHz.
      c. Normal-Mode Noise Attenuation: Minimum of minus 52 dBA at 1.5 to 10 kHz.
L. Wall Brackets: Manufacturer's standard brackets.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Wall-Mounted Transformers:
   1. 30-kVA and Less: Provide manufacturer's standard wall bracket.
   2. 45-kVA and Larger: Provide custom-fabricated welded red iron frame.

B. Ceiling-Hung Transformers:
   1. 30-kVA and Less: Support with Unistrut frame suspended with 1/2" diameter all-thread rod.
   2. 45-kVA and Larger: Provide custom-fabricated welded red iron frame.

C. Floor-Mounted Transformers:
   1. Mount to concrete base according to Section 260529-Hangers and Supports.
   2. Provide vibration pads under transformer according to Section 260548-Vibration and Seismic Controls.

3.2 IDENTIFICATION DEVICES:

A. Label each transformer with an engraved laminated plastic nameplate as specified in Section 260553-Identification.

3.3 ADJUSTING

A. Record transformer secondary voltage at each unit for at least 12 hours of typical occupancy period. Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus three percent at maximum load conditions.


END OF SECTION
SECTION 26 24 16

PANELBOARDS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Product Data: Submit for each type of panelboard, overcurrent protective device, transient voltage suppression device and accessory provided.

B. Overcurrent Protective Device Coordination Study: Submit for review along with product data. Refer to Division 26, “Overcurrent Protective Device Coordination Study.”

1.2 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

1.3 SELECTIVE COORDINATION

A. The emergency distribution system shall be selectively coordinated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Panelboards and Overcurrent Protective Devices:
   a. Square D
   b. General Electric
   c. Siemens

B. The basis of design manufacturer for this project is Square D to establish the minimum standards for quality and performance. Other manufacturers are acceptable only if:

   1. The equipment is from one of the manufacturers listed above.
   2. The equipment quality and performance is equal to the Basis of Design.
   3. The equipment dimensions are equal to or smaller than the Basis of Design.
2.2 FABRICATION

A. Enclosures:

1. Rated for environmental conditions at installed location.
   a. Outdoor, Wet or Damp Locations: NEMA 250, Type 3R.

2. Doors: Door-within-door type.
3. Finish: Manufacturer's standard enamel finish over corrosion-resistant treatment or primer coat.

B. Phase and Ground Buses:

2. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors; bonded to box.

C. Conductor Connectors: Suitable for use with conductor material.

1. Main and Neutral Lugs: Compression type.
2. Ground Lugs and Bus Configured Terminators: Compression type.
3. Feed-Through Lugs: Compression type suitable for use with conductor material. Locate at opposite end of bus from incoming lugs or main device.

D. Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect switches.

E. Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

2.3 SHORT-CIRCUIT RATING

A. Fully rated to interrupt the symmetrical short-circuit current available at the terminals.

2.4 DISTRIBUTION PANELBOARDS

A. Branch Overcurrent Protective Devices:


B. Doors: Door-within-door type secured with vault-type latch with tumbler lock; keyed alike.
2.5 PANELBOARDS

A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

B. Doors: Door-within-door type, concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.6 OVERCURRENT PROTECTIVE DEVICES

A. Molded-case circuit breaker with interrupting capacity to meet available fault currents. Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250A and larger.

B. Circuit Breakers Rated 800 Amps or More: Provide electronic trip unit with adjustable Long-Time, Short-Time and Instantaneous trip functions. Provide ground fault protection (G) where called out on the one-line drawing.

C. Circuit Breakers Rated 1200 Amps or More: Provide trip unit with a maintenance mode switch with LED indicator lights that overrides the trip settings in order to minimize the arc flash hazard during maintenance.

2.7 SPACE FOR FUTURE CIRCUIT BREAKERS OR FUSED SWITCHES

A. Provide as indicated on the drawings. Spaces shall be completely equipped for the future addition of a circuit breaker or fused switch, including all mounting hardware and buss connections. Unless otherwise noted, spaces shall be sized to accommodate the following future circuit breaker or fused switch:

B. | PANEL RATING   | MINIMUM SPACE AMPACITY |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100 Amperes</td>
<td>70 Amperes</td>
</tr>
<tr>
<td>225 Amperes</td>
<td>125 Amperes</td>
</tr>
<tr>
<td>400 Amperes</td>
<td>225 Amperes</td>
</tr>
<tr>
<td>600 Amperes</td>
<td>400 Amperes</td>
</tr>
<tr>
<td>800 Amperes</td>
<td>600 Amperes</td>
</tr>
<tr>
<td>1200 Amperes</td>
<td>800 Amperes</td>
</tr>
</tbody>
</table>
PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount top of trim 74 inches above finished floor, unless otherwise indicated.

B. Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

C. Install overcurrent protective devices and controllers. Set field-adjustable switches and circuit-breaker trip ranges.

D. Install filler plates in unused spaces.

E. Stub four one-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four one-inch empty conduits into raised floor space or below slab not on grade.

F. Arrange conductors in gutters into groups and bundle and wrap with wire ties.

3.2 DIRECTORY

A. Provide a directory to indicate installed circuit loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

3.3 IDENTIFICATION DEVICES

A. Label each panelboard with an engraved laminated plastic nameplate as specified in Division 26-Identification.

3.4 ACCEPTANCE TESTING

A. After all wiring is complete, all feeder and branch circuit terminations shall be checked with a torque wrench. Torque levels shall be in accordance with NETA Standard ATS unless otherwise specified by the manufacturer. A test report which gives the following information for each panelboard shall be submitted to the Engineer two weeks prior to final inspection:

1. Size and insulation type of the phase, neutral and ground conductors.
2. Phase-to-phase and phase-to-neutral operating load voltage.
3. Operating load current (each phase, neutral and ground).

B. Phase-to-phase and phase-to-neutral conductor insulation resistance. Test shall be made with a DC "Megger" (500-volt minimum) type tester. If tests indicate faulty insulation (less than 8 megohms), the conductors shall be replaced and retested.
C. Comply with Section 26 01 26, Acceptance Testing of Electrical Systems.

END OF SECTION
SECTION 26 27 26
WIRING DEVICES

PART 1 - GENERAL

1.1 SUBMITTALS
A. Product Data: Submit for each type of product provided.

1.2 COORDINATION
A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

PART 2 - PRODUCTS

2.1 GENERAL
A. Devices with preconnectorized pigtails are not acceptable.

2.2 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Specification
      a. Arrow Hart
      b. Hubbell
      c. Leviton
      d. Pass & Seymour
   2. Industrial Extra Duty Grade

2.3 SPECIFICATION-GRADE DEVICES
A. Straight Blade Receptacles:
   1. Convenience Receptacles, 125 volt, 15 ampere, NEMA 5-15R. Subject to compliance with requirements, provide one of the following products:
      a. Arrow Hart; 5252 (duplex)
b. Hubbell; 5252 (duplex)
c. Leviton; 5252 (duplex)
d. Pass & Seymour; 5252 (duplex)

2. Dedicated Receptacles, 125 volt, 20 ampere, NEMA 5-20R. Subject to compliance with requirements, provide one of the following products:
   a. Arrow Hart; 5352 (duplex)
   b. Hubbell; 5352 (duplex)
   c. Leviton; 5352 (duplex)
   d. Pass & Seymour; 5352 (duplex)

B. GFCI Receptacles:
   1. General Description: Straight blade, non-feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, and include indicator light that is lighted when device is tripped.
   2. Duplex GFCI Convenience Receptacles, 125 volt, 20 ampere: Subject to compliance with requirements, provide one of the following products:
      a. Arrow Hart; SGF20
      b. Hubbell; GFRST20 series
      c. Pass & Seymour; 2097TRA
      d. Leviton; GFNT2

2.4 TOGGLE SWITCHES

A. Comply with NEMA WD 1 and UL 20.

B. Switches, 120/277 Volt, 20 Amperes: Subject to compliance with requirements, provide one of the following products:
   1. Cooper; 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way)
   2. Hubbell; 1221 (single pole), 1222 (two pole), 1223 (three way), 1224 (four way)
   3. Leviton; 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way)
   4. Pass & Seymour; 20AC1 (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way)

2.5 WEATHERPROOF RECEPTACLES

A. Provide 20A duplex GFCI receptacle with metallic cover that is UL Extra-Duty While-In-Use weatherproof whether or not the attachment plug is inserted.
   1. Intermatic WP 1010MC cover.
   2. Hubbell WP26E
2.6 DEVICE PLATES

A. Finished Areas-Surface or Flush-Mounted: 302/304 stainless steel.
   1. Hubbell; SS Series
   2. Pass & Seymour


2.7 FINISHES

A. Color:

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:
   1. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
   2. Install device boxes in brick or block walls so that the coverplate does not cross a joint unless the joint is troweled flush with the face of the wall.
   3. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors: The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300 without pigtails.

D. Device Installation:
   1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.
   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
   4. Connect devices to branch circuits using pigtails that are not less than six inches in length.
   5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.
6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15- or 20-ampere circuits, splice No. 12 AWG pigtail for device connections.

8. Tighten unused terminal screws on the device.

9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation: Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated mount flush with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

A. Receptacles: Laser-engrave faceplate with panel and circuit number.

B. Special Receptacles Other Than 15 or 20 Ampere, 120 Volt: Laser-engrave faceplate with ampere rating, voltage, phase, panel and circuit number.

END OF SECTION
PART 1 - GENERAL

1.1 SUBMITTALS
A. Product Data: Submit for each type of product provided.

1.2 COORDINATION
A. Coordinate fuse ratings with utilization equipment nameplate limitations of maximum fuse size.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Cooper Bussman
   2. Ferraz Shawmut
   3. Littelfuse

2.2 CARTRIDGE FUSES
A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

2.3 SPARE-FUSE CABINET
A. Cabinet: Wall-mounted, 0.05-inch thick steel unit with full-length, recessed piano-hinged door and key-coded cam lock and pull.
   1. Size: Adequate for storage of spare fuses specified with 15 percent spare capacity minimum.
   2. Finish: Gray, baked enamel.
   3. Identification: "SPARE FUSES" in 1-1/2-inch high letters on exterior of door.
   4. Fuse Pullers: Provide for each size of fuse.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine utilization equipment nameplates and installation instructions. Install fuses of sizes and with characteristics appropriate for each piece of equipment.

3.2 FUSE APPLICATIONS

A. Service Entrance: Class RK1, time delay.
B. Feeders: Class RK1, time delay.
C. Motor Branch Circuits: Class RK1, time delay.

3.3 INSTALLATION

A. Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.
B. Install spare-fuse cabinet (if no location is shown, install in the Main Electrical Room).

3.4 SPARE FUSES

A. Provide one complete set of spare fuses (three fuses to a set) for each size and type shown. Install spare fuses in a spare fuse cabinet in the Main Electrical Room. Any spare fuses utilized during testing must be replaced in order to leave the Owner a complete set of spare fuses at completion of the project.

END OF SECTION
SECTION 26 28 16

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Product Data: Submit for each type of enclosed switch, circuit breaker and accessory being provided.

1.2 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with other construction, including conduit, piping, equipment, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Square D
2. General Electric
3. Siemens

B. The basis of design for this project is Square D to establish the minimum standards for quality and performance. Other manufacturers are acceptable only if:

1. The equipment is from one of the manufacturers listed above.
2. The equipment quality and performance is equal to the basis of design.
3. The equipment dimensions are equal to or smaller than the basis of design.

2.2 FUSIBLE AND NONFUSIBLE SWITCHES

A. Fusible Switch-600A and Smaller: NEMA KS 1, Type HD with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

B. Nonfusible Switch-600A and Smaller: NEMA KS 1, Type HD, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

09/30/19
2.3 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. Molded-Case Circuit Breaker: NEMA AB 1 with interrupting capacity to meet available fault currents. Provide with the following features and accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical style with compression lug kits suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.

B. Molded-Case Switches: Molded-case circuit breaker with fixed, high-set instantaneous trip only, and short-circuit withstand rating equal to equivalent breaker frame size interrupting rating. Provide with the following features and accessories:

1. Lugs: Mechanical style with compression lug kits suitable for number, size, trip ratings, and material of conductors.
2. Application Listing: Type HACR for heating, air-conditioning, and refrigerating equipment.

2.4 ENCLOSURES

A. Rated for environmental conditions at installed locations.

1. Outdoor, wet or damp locations; NEMA 250, Type 3R.
3. Other wet or damp indoor locations; NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Control Equipment Mounted to Walls: Mount adjacent units at uniform height. Bolt units to wall or mount on lightweight structural-steel channels bolted to wall. Provide freestanding racks complying with Section 260529-Hangers and Supports, for controllers not located on walls.

B. Floor-Mounted Control Equipment: Anchor to concrete base.

C. Install fuses in each fusible switch.

3.2 IDENTIFICATION DEVICES

A. Label each switch and circuit breaker on engraved laminated plastic as specified in Section 260553-Identification.
3.3 ADJUSTING

A. Set field-adjustable switches and circuit-breaker trip ranges.

END OF SECTION
SECTION 26 51 00
INTERIOR LIGHTING

PART 1 - GENERAL

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

1.2 DEFINITIONS
A. BF: Ballast factor.
B. CCT: Correlated color temperature.
C. CRI: Color-rendering index.
D. HID: High-intensity discharge.
E. LER: Luminaire efficacy rating.
F. LED: Light Emitting Diode
G. Lumen: Measured output of lamp and luminaire, or both.
H. Luminaire: Complete lighting fixture, including lamp, ballast and/or driver, if included.

1.3 SUBMITTALS
A. Product Data: Provide for each type of product being used on project.
B. Shop Drawings: Provide as specified on the luminaire schedule.
C. Special Submittals: Provide special submittals as specified on the Luminaire Schedule.

1.4 CLOSEOUT SUBMITTALS
A. Provide for all lighting equipment and luminaires including the following:
   1. Specification sheets for each type of luminaire, lamp, ballast and driver.
   2. Non LED Fixtures: Provide a list that gives the lamp and ballast part number for each luminaire type.
3. LED Fixtures: Provide a list that gives the driver part number for each luminaire type.

1.5 COORDINATION
A. Coordinate layout and installation of luminaires and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.
B. Provide ballasts/drivers that match the service voltage being provided to the fixture.
C. Provide ballasts/drivers as required to accommodate the fixture switching/dimming scheme shown on the drawings.

1.6 EXTERIOR AND DAMP LOCATION FIXTURES
A. Fixtures installed in the following locations shall be UL listed and labeled for wet locations:
   1. Exterior locations
   2. Interior wet locations
   3. Interior damp locations

1.7 ACCESSORIES
A. General: Provide all required hardware and accessories for a complete installation.
B. Trims: The Contractor shall coordinate with the architectural drawings and provide the appropriate trim for each recessed fixture.
C. Fluorescent industrial and strip fixtures shall be provided with the following accessories:
   1. Clear plastic lamp sleeves
   2. Wire guards.

1.8 MANUFACTURERS' CATALOG NUMBERS
A. Catalog series numbers specified represent the type and style of luminaire. Complete part numbers shall be based on series numbers and written descriptions in Luminaire Schedule.

1.9 WARRANTY
A. Special Warranty for Fluorescent Lamp/Ballasts: Provide manufacturer's five-year lamp/ballast warranty.
B. Special Warranty for LED Luminaires, Drivers, and Controllers for Solid-State Lighting Systems: Provide a five-year warranty against defects in workmanship or material. Warranty shall include labor charges incurred for replacement of inoperative in-warranty equipment.

1.10 LUMINAIRE TYPE SYMBOLS

A. The luminaire type symbols indicated on the drawings are intended to show the type of luminaire in that particular general area. If a luminaire type symbols is missing from a particular room or area, the Contractor shall assume, for purpose of bidding only, that the luminaire type is SL.C1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Refer to Luminaire Schedule on the drawings.

B. LED Diode:
   1. CREE
   2. Nichia
   3. Osram Opto Semiconductors
   4. Philips Lumileds

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES AND COMPONENTS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.

D. Diffusers:
   1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and/or UV radiation.
      a. Lens Thickness: 0.125 inch minimum.
      b. UV stabilized.

E. Linear Luminaires:
1. Fluorescent linear luminaires are shown in individual four foot sections on the drawings. Extruded luminaires may be provided in 12 foot sections (maximum) at the Contractor's option. Tandem or through wired ballasts are not allowed. Provide a separate ballast for each four foot luminaire section.

2. LED linear luminaires are shown actual length on the drawings based on increments offered by manufacturer. Driver quantity to be based on manufacturer's recommendation per fixture length.

2.3 GENERAL REQUIREMENTS FOR LEDS

A. Correlated color temperature (CCT) for phosphor-coated white LEDs must have one of the following designated CCT's and fall within the following binning standards:

1. 2700K defined as 2725 +/- 145K
2. 3000K defined as 3045 +/- 175K
3. 3500K defined as 3465 +/- 245K
4. 4000K defined as 3985 +/- 275K
5. 4500K defined as 4503 +/- 243K
6. 5000K defined as 5028 +/- 283K
7. 5700K defined as 5665 +/- 355K
8. 6500K defined as 6530 +/- 510K

B. Color spatial uniformity shall be limited to variations in chromaticity for different directions (i.e., changes in viewing angle).

C. Color maintenance shall be limited to a maximum change in chromaticity of 0.007 over the lifetime of the product.

D. Color Rendering Index:

1. Color rendering index to be determined using ANSI C78.377-2008 and applicable IESNA standards.
2. Laboratory tests must be produced using specific module(s)/array(s) and driver combination that will be used in production.
3. Manufacturers must provide a test report from a laboratory accredited by NVLAP or one of its MRA signatories.

E. Lumen Depreciation:

1. Lumen depreciation to be measured using IESNA LM-80-08 standard for IES approved method of measuring lumen maintenance of LED light sources.
2. Phosphor coated white LED module(s)/array(s) shall deliver at least 70 percent of initial lumens for a minimum of 35,000 hours when installed in position and operated at 100 percent output and the maximum specified operating temperature.
3. Colored LED module(s)/array(s) shall deliver at least 50 percent of initial lumens for a minimum of 35,000 hours when installed in position and operated at 100 percent output and the maximum specified operating temperature.
F. Luminaire Efficacy:
   1. Luminaire efficiency shall be measured using IESNA LM-79-08 standard for
      electrical and photometric measurements of solid-state lighting products.
   2. Manufacturer shall provide published luminaire efficacy, which is defined as
      luminaire light output divided by luminaire input power measured in a 25 degree
      Celsius environment. Efficacy shall include driver, thermal, optical, and luminaire
      losses.

G. Thermal Management:
   1. Solid-state luminaire shall not exceed LED manufacturer’s maximum junction
      temperature requirements when operated in position at luminaire manufacturer’s
      maximum ambient operating temperature and 100 percent light output.
   2. Solid-state luminaire shall be thermally protected using one or more of the
      following thermal management techniques:
      a. Metal Core Board
      b. Gap Pad
      c. Internal Monitoring Firmware
   3. Solid-state luminaire housing shall be designed to transfer heat from the LED
      board to the outside environment.

2.4 LED DRIVERS:
A. Driver shall have a power factor of 0.90 or greater for primary application.
B. Driver input current shall have Total Harmonic Distortion (THD) of less than 20 percent.
C. Driver shall have a minimum operating temperature of minus 4 degrees Fahrenheit
   (minus 20 degrees Celsius) or below when used in luminaires intended for outdoor
   applications.
D. Driver output operating frequency to be equal to or greater than 120 Hz.
E. Driver shall operate with sustained input variations of +/- 10 percent (voltage and
   frequency) with no damage to the driver.
F. Driver shall tolerate sustained open circuit and short circuit output conditions without
   damage and without need for external fuses or trip devices.
G. Driver output shall be regulated to +/- 5 percent across published load range.
H. Driver shall have a Class A sound rating.
I. Driver output shall have current limiting protection.
J. Driver shall operate LEDs at constant and regulated current levels. LEDs shall not be overdriven beyond the diode manufacturer’s specified nominal voltage and current.

2.5 LUMINAIRE SUPPORT COMPONENTS

A. Comply with Section 260529-Hangers and Supports for Electrical Systems for channel- and angle-iron supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire, unless noted otherwise in Luminaire Schedule.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single luminaire. Finish same as luminaire, unless noted otherwise in Luminaire Schedule.


E. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 12 gauge.

F. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

2.6 LED LUMINAIREs

A. All hardwired connections to solid-state luminaires shall be reverse polarity protected and provide high-voltage protection in the event connections are reversed.

B. Solid-state lighting installations shall be UL listed as a low-voltage lighting system, including, but not limited to; luminaire, driver, controller, keypad and wiring.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Luminaires:
   1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
   2. Install lamp(s) in each luminaire.
   3. Contractor shall not install luminaire lenses, diffusers, or parabolic louvers in luminaires until general construction work is complete, including painting. Dirty lenses, diffusers, or louvers shall be removed, washed and rinsed as recommended by luminaire manufacturer.

B. Temporary Lighting: Do not use permanent luminaires for temporary lighting unless approved by the Design Team. If approved to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When
construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.

C. Remote Mounting of Ballasts/Drivers: Distance between the ballast/driver and luminaire shall not exceed that recommended by ballast/driver manufacturer. Verify maximum distance between ballast/driver and luminaire with ballast/driver manufacturer.

D. Lay-in Ceiling Luminaire Supports:

1. Do not use ceiling grid as support for fixtures.
2. Install ceiling support system rods or wires independent of the ceiling suspension devices, for each luminaire. Locate not more than 6 inches from luminaire corners.
3. Support Clips: Fasten to luminaire and to ceiling grid members at or near each luminaire corner with clips that are UL listed for the application.
4. Luminaires of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support luminaire independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
5. Install at least one independent support rod or wire from structure to a tab on luminaire. Wire or rod shall have breaking strength of the weight of luminaire at a safety factor of 3.

E. Suspended Luminaire Support:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
3. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

F. All pendant-mounted luminaires shall contain horizontal restraints. Provide aircraft cable between luminaire housing and adjacent structure in four directions.

G. Mounting Heights:

1. Pendant-mounted luminaires shown on plans or in specifications shall be to the bottom of the luminaire.
2. Wall-mounted luminaires shall be to the center of the outlet box unless otherwise noted.

H. Contractor shall coordinate the location and mounting heights of the luminaires in mechanical rooms with the available space left between the various ducts and piping.

I. Contractor shall clean and re-lamp all existing luminaires being reused in remodeled areas and replace any broken or defective parts including noisy ballasts.

J. All existing luminaires not being reused and not to be retained by the Owner shall become the property of the Contractor and be removed from the site.
K. Contractor shall remove all ballasts that contain PCB’s and dispose in accordance with local, state and federal regulations. Provide receipt from governing agency indicating the quantity of ballasts disposed.

3.2 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in "Identification for Electrical Systems."

3.3 INSTALLED SPARE PARTS

A. Provide the following spare parts:

<table>
<thead>
<tr>
<th>DEVICE</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SL.C1</td>
<td>1</td>
</tr>
</tbody>
</table>

B. Spare devices shall include 75’ of conduit and wiring as required for a complete installation. Location of these units to be determined by the Owner’s Representative at the site. The Contractor shall assume that these devices will be installed after all other work is completed. Installation shall occur on an accelerated (night/weekend) schedule. Unused units are to be turned over to the Owner.

END OF SECTION
SECTION 27 05 00
COMMON WORK RESULTS FOR COMMUNICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS
   A. Comply with all requirements of Division 26.

1.2 DEFINITION
   A. Telecommunications Room: MDF (ER) or IDF (TR or TC).
   B. Pathway: Conduit, cable tray, sleeves, junction-hooks and D-rings.

1.3 SUMMARY
   A. Design-Build Pathway System:
      1. In general, only devices have been shown on the drawings. The Contractor shall provide a complete design-build pathway system.
      2. Minimum raceway size shall be 3/4”.
      3. Unless specified as "open cabling" all wire and cabling shall be installed in continuous metallic raceways according to Section 260533-Raceways and Boxes.
      4. Where specified as "open cabling" provide metallic raceways for cables in walls, above inaccessible ceilings, exposed or where subject to physical damage. Minimum raceway size shall be 3/4”.
      5. Raceway fill shall not exceed 40 percent.
   B. Wire and Cable:
      1. Comply with all requirements of Division 26 and other provisions of this section.
      2. Unless specified otherwise, all cabling shall be plenum rated.
      3. Provide wire and cable for each system according to the manufacturers requirements.
      4. Underground cabling shall be UL listed for direct build.

1.4 SUBMITTALS
   A. Product Data: Submit for each type of product provided.
B. Shop Drawings:

1. Raceway Riser Diagrams: Provide detailed raceway layout. Include designation of devices connected by raceway, raceway type and size, and type and size of wire and cable fill for each raceway run.
2. Site and Floor Plans: Indicate final outlet and device locations, routing of raceways, and cables inside and outside the building.
3. Device Identification: Identify each device by its address or identification number.
4. System Wiring Diagrams: Include system diagrams unique to project. Show connections for all devices, components, and auxiliary equipment. Include diagrams for equipment and for system with all terminals and interconnections identified.
5. Shop drawings shall utilize the final room numbers established by the Owner, not the room and building numbers shown on the architectural floor plans.

PART 2 - PRODUCTS

2.1 GENERAL

A. Comply with all requirements of Division 26.

2.2 BACKBOARDS

A. Plywood, fire-retardant treated, 3/4 by 48 by 96 inches.

PART 3 - EXECUTION

3.1 PATHWAY INSTALLATION

A. Comply with ANSI/TIA -569-D for pull-box sizing and length of conduit and number of bends between pull points.

B. Comply with the material and installation requirements specified in Section 260533-Raceways and Boxes."

C. Provide long-radius elbows for all underground raceways.

D. Pathway Installation in Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits four inches above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.2 WIRING INSTALLATION

A. Do not share raceways with other building wiring systems.
B. Wiring Within Enclosures: Bundle, lace and train conductors to terminal points. Use lacing bars and distribution spools. Separate power-limited and nonpower-limited conductors as recommended in writing by manufacturer. Install conductors parallel with or at right angles to sides and back of enclosure. Connect conductors that are terminated, spliced, or interrupted in any enclosure associated with intrusion system to terminal blocks. Mark each terminal according to system's wiring diagrams. Make all connections with approved crimp-on terminal spade lugs, pressure-type terminal blocks, or plug connectors.
C. Splices, Taps and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets, and equipment enclosures.
D. Identification of Conductors and Cables: Color code conductors and apply wire markers. Coordinate with shop drawings.

3.3 BACKBOARDS

A. Provide plywood backboards on all four walls of each telecommunications room.
B. Install backboards with 96-inch dimension vertical. Bottom of plywood is to be six inches above finished floor. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.
C. Paint backboards flat white.

3.4 SLEEVES

A. Interior Penetrations of Nonrated Walls, Floors and Ceilings: Provide EMT sleeves. Seal space between the raceway and the wall or floor using joint sealant appropriate for the size, depth and location of the joint. Comply with requirements in Section 079005-Joint Sealants.
B. Fire-Rated Assembly Penetrations:
   1. Provide STI "EZ-Path" assemblies for penetrations at walls, partitions and ceilings.
2. Provide EMT sleeves for penetrations and floors. Seal pathway and cable penetration with fire stop materials.

3.5 IDENTIFICATION DEVICES

A. Identify system components, wiring, cabling and terminals according to Section 260553-Identification.

3.6 FIRESTOPPING

A. Provide firestopping to penetrations of fire-rated assemblies to restore original fire-resistance rating of assembly.

3.7 AS-BUILT SHOP DRAWINGS

A. At the completion of the project, provide a complete set of as-built shop drawings (hard copy and CD) showing the following as-built:

1. Raceway layout
2. Device locations
3. Device identification numbers

END OF SECTION
SECTION 27 11 00
COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Refer to Division 27, Section 270500, "Common Work Results for Communications," for general requirements that apply to this section. Comply with all requirements of Section 270500.

1.2 DEFINITIONS


B. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

C. LAN: Local area network

D. RCDD: Registered Communications Distribution Designer

E. Trough or Ventilated Cable Tray: A fabricated structure consisting of integral or separate longitudinal rails and a bottom having openings sufficient for the passage of air and using 75 percent or less of the plan area of the surface to support cables.

1.3 SUBMITTALS

A. Product Data: Submit for each type of product provided.

B. Shop drawings for communications equipment room fittings. Include plans, elevations, sections, details, and attachments to other work.

1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

2. Equipment Racks and Cabinets: Include workspace requirements and access for cable connections.


09/30/19
1.4 QUALITY ASSURANCE

A. Installer Qualifications: Cabling Contractor must have personnel certified by BICSI on staff.
   1. Layout Responsibility: Preparation of shop drawings shall be under the direct supervision of a BICSI as RCDD.
   2. Installation Supervision: Installation shall be under the direct supervision of a BICSI who shall be present at all times when Work of this Section is performed at project site.
   3. Field Inspector: Currently registered by a BICSI as RCDD to perform the on-site inspection.

B. 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.

C. Telecommunications Pathways and Spaces: Comply with TIA/EIA-569-A.


PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled. Cable support brackets shall be designed to prevent degradation of cable performance and pinch points that could damage cable. Cable tie slots fasten cable ties to brackets.
   1. Comply with NFPA 70 and UL 2043 for fire-resistant and low-smoke-producing characteristics.
   2. Support brackets with cable tie slots for fastening cable ties to brackets.
   3. Lacing bars, spools, junction-hooks and D-rings.
   4. Straps and other devices.

C. Conduit and Boxes: Comply with requirements in Division 26, "Raceway and Boxes."

2.2 BACKBOARDS

A. Backboards: Plywood; fire-retardant treated, and 3/4 by 48 by 96 inches. Comply with requirements for plywood backing panels specified in Division 06, "Rough Carpentry."
2.3 EQUIPMENT FRAMES

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

B. General Frame Requirements:
   1. Distribution Frames: Wall-mounted modular-steel units designed for telecommunications terminal support and coordinated with dimensions of units to be supported.
   3. Finish: Manufacturer's standard, baked-polyester powder coat.

C. Cable Management for Equipment Frames:
   1. Metal with integral wire retaining fingers.
   2. Baked-polyester powder coat finish.
   3. Vertical cable management panels shall have front and rear channels with covers.
   4. Provide horizontal crossover cable manager at the top of each relay rack with a minimum height of two rack units each.

2.4 POWER STRIPS

A. Power Strips: Comply with UL 1363.

   1. Wall-mounted.
   2. Six, 20 A, 120 Volt ac, NEMA WD 6, Configuration 5-20R receptacles.
   3. LED indicator lights for power and protection status.
   4. LED indicator lights for reverse polarity and open outlet ground.
   5. Cord connected with 6-foot line cord.
   6. Rocker-type on-off switch illuminated when in on position.

2.5 GROUNDING

A. Comply with requirements in Division 26, "Grounding and Bonding" for grounding conductors and connectors.

B. Telecommunications Main Bus Bar:

   1. Connectors: Mechanical type, cast silicon bronze, solderless, compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.
   2. Ground Bus Bar: Copper, minimum 1/4-inch thick by four inches wide with 9/32-inch holes spaced 1-1/8 inches part.
3. Stand-Off Insulators: Comply with UL 891 for use in switchboards, 600 volt. Lexan or PVC, impulse tested at 5000 volt.

C. Comply with ANSI-J-STD-607-A.

2.6 LABELING

A. Comply with TIA/EIA-606-A and UL 969 for a system of labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Install pathways complying with recommendations in TIA/EIA-569-A, "Entrance Facilities". Install underground entrance pathway complying with Division 26, "Raceway and Boxes."

3.2 INSTALLATION

A. Comply with NECA 1.

B. Comply with BICSI TDMM for layout and installation of communications equipment rooms.


D. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

3.3 FIRESTOPPING

A. Comply with requirements in Division 07, "Penetration Firestopping."

3.4 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least two-inch clearance behind the grounding bus bar. Connect
grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical to building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor. Bond the shield of shielded cable to the grounding bus bar in communications rooms and spaces.

3.5 IDENTIFICATION

A. Identify system components, wiring and cabling complying with TIA/EIA-606-A. Comply with requirements in Division 26, "Identification."

B. Comply with requirements in Division 09, "Interior Painting" for painting backboards. Do not paint over manufacturer’s label for fire-resistant plywood.

C. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 3 level of administration.

D. Labels shall be preprinted or computer-printed type.

END OF SECTION
PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Refer to Section 270500-Common Work Results for Communications, for general requirements that apply to this section. Comply with all requirements of Section 270500.

1.2 DEFINITIONS

A. BICSI: Building Industry Consulting Service International

B. Consolidation Point: A location for interconnection between horizontal cables extending from building pathways and horizontal cables extending into furniture pathways.

C. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.

D. EMI: Electromagnetic interference

E. IDC: Insulation displacement connector

F. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).

G. LAN: Local area network

H. MUTOA: Multiuser telecommunications outlet assembly; a grouping in one location of several telecommunications outlet/connectors.

I. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.

J. RCDD: Registered Communications Distribution Designer

K. Trough or Ventilated Cable Tray: A fabricated structure consisting of longitudinal side rails and a bottom having openings for the passage of air.

L. UTP: Unshielded twisted pair
1.3 HORIZONTAL CABLE DESCRIPTION

A. Horizontal cable and its connecting hardware provide the means of transporting signals between the Telecommunications Room and the horizontal cross-connect located in the communications equipment room. This cabling and its connecting hardware are called "permanent link," a term that is used in the testing protocols.

1. TIA/EIA-568-B.1 requires that a minimum of two telecommunications outlet/connectors be installed for each work area.
2. Horizontal cabling shall contain no more that one transition point or consolidation point between the horizontal cross-connect and the telecommunications outlet/connector.
3. Bridged taps and splices shall not be installed in the horizontal cabling.
4. Splitters shall not be installed as part of the optical fiber cabling.

1.4 PERFORMANCE REQUIREMENTS

A. General Performance: Horizontal cabling system shall comply with transmission standards in TIA/EIA-568-B.1 when tested according to test procedures of this standard.

1.5 SUBMITTALS

A. It shall be understood that the Electrical and Telecommunications details and drawings provided with the specifications package are diagrammatic. They are included to show the intent of the specifications and to aid the telecommunications contractor in bidding the job.

B. The telecommunications contractor shall submit complete system shop drawings for approval. The shop drawings shall provide the following information as a minimum:

2. Riser diagram showing the fiber and copper connections between the Main Entrance Room (MER) and each Telecommunications Room (TR).
3. Elevation of all walls in the Main Entrance Room (MER) and each Telecommunications Room (TR) showing the location of all wall-mounted equipment, cable tray, etc.
4. Elevation of each equipment rack showing the patch panels and wire management. Provide a matrix for each patch panel showing the jack number of each port.
5. Floor plan showing the location of each telecommunications outlet with the associated jack numbers.
6. Sample faceplate with jack labels.
7. Shop drawings shall utilize the final room numbers established by the Owner, not the room and building numbers shown on the Architectural Floor Plans.

C. Submittal information shall include the name of each Leviton authorized installer who may be used in the conduct of the project, and evidence of certification.

09/30/19
1.6 COORDINATION

A. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.

B. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

PART 2 - PRODUCTS

2.1 PATHWAYS

A. General Requirements: Comply with TIA/EIA-569-A.

B. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.

1. Support brackets with cable tie slots for fastening cable ties to brackets.
2. Lacing bars, spools, junction hooks and D-rings.
3. Straps and other devices.

C. Cable Trays: Comply with the requirements of Division 26.

D. Conduit and Boxes: Comply with requirements in Section 260533-Raceways and Boxes.

2.2 UTP CABLE

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

1. Berk-Tek; a Nexans company
2. SYSTIMAX Solutions; a CommScope, Inc. brand
3. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. Description: 100-ohm, four-pair UTP, formed into 25-pair binder groups covered with a blue thermoplastic jacket.

1. Comply with ICEA S-90-661 for mechanical properties.
2. Comply with TIA/EIA-568-B.1 for performance specifications.
4. Listed and labeled by an NRTL acceptable to Authorities Having Jurisdiction as complying with UL 444 and NFPA 70 for the following types:

a. Communications, Plenum Rated: Type CMP, complying with NFPA 262.
b. Multipurpose, Plenum Rated: Type MPP, complying with NFPA 262.
2.3 UTP CABLE HARDWARE

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Panduit Corp.
   2. Tyco Electronics/AMP Netconnect; Tyco International Ltd.

B. General Requirements for Cable Connecting Hardware: Comply with TIA/EIA-568-B.2, IDC type with modules designed for punch-down caps or tools. Cables shall be terminated with connecting hardware of same category or higher.

C. Connecting Blocks: 110-style IDC for Category 6. Provide blocks for the number of cables terminated on the block, plus 25 percent spare. Integral with connector bodies, including plugs and jacks where indicated.

D. Cross-Connect: Modular array of connecting blocks arranged to terminate building cables and permit interconnection between cables. One terminal per field for each conductor in assigned cables.

E. Patch Panel: Modular panels housing multiple-numbered jack units with IDC-type connectors at each jack for permanent termination of pair groups of installed cables. One jack per field for each four-pair UTP cable indicated.

F. Jacks and Jack Assemblies: Modular, color-coded, eight-position modular receptacle units with integral IDC-type terminals.

G. Patch Cords: Factory-made, four-pair cables in 36-inch lengths; terminated with eight-position modular plug at each end.
   1. Patch cords shall have bend-relief-compliant boots and color-coded icons to ensure Category 6 performance. Patch cords shall have latch guards to protect against snagging.
   2. Patch cords shall have color-coded boots for circuit identification.

2.4 TELECOMMUNICATIONS OUTLET/CONNECTORS


B. Workstation Outlets: Four-port-connector assemblies mounted in single faceplate.
   2. Snap-in jacks accommodating any combination of UTP, optical fiber, and coaxial work area cords.
      a. Flush mounting jacks, positioning the cord at a 45-degree angle.
      b. Legend: Machine printed in the field using adhesive-tape label.

2.5 GROUNDING

A. Comply with requirements in Division 26, Section 260526, "Grounding and Bonding" for grounding conductors and connectors.

B. Comply with ANSI-J-STD-607-A.

2.6 IDENTIFICATION PRODUCTS

A. Comply with TIA/EIA-606-A and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.

B. Comply with requirements in Section 260553-Identification.

2.7 SOURCE QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate cables.

B. Factory test UTP and optical fiber cables on reels according to TIA/EIA-568-B.1.

C. Factory test UTP cables according to TIA/EIA-568-B.2.

D. Factory test multimode optical fiber cables according to TIA/EIA-526-14-A and TIA/EIA-568-B.3.

E. Factory-sweep test coaxial cables at frequencies from 5 MHz to 1 GHz. Sweep test shall test the frequency response or attenuation over frequency, of a cable by generating a voltage whose frequency is varied through the specified frequency range and graphing the results.

F. Cable will be considered defective if it does not pass tests and inspections.

G. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 ENTRANCE FACILITIES

A. Coordinate backbone cabling with the protectors and demarcation point provided by communications service provider.
3.2 WIRING METHODS

A. Wiring Method: Install cables in raceways and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables except in unfinished spaces.

1. Install plenum cable in environmental air spaces, including plenum ceilings.
2. Comply with requirements for raceways and boxes specified in Section 260533-Raceways and Boxes.

B. Wiring Method: Conceal conductors and cables in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.

3.3 INSTALLATION OF PATHWAYS

A. Cable Trays: Comply with NEMA VE 2 and TIA/EIA-569-A-7.

B. Comply with requirements for demarcation point, pathways, cabinets, and racks specified in Section 271100-Communications Equipment Room Fittings. Drawings indicate general arrangement of pathways and fittings.

C. Comply with TIA/EIA-569-A for pull-box sizing and length of conduit and number of bends between pull points.

D. Comply with requirements in Section 260533-Raceway and Boxes for installation of conduits and wireways.

E. Install manufactured conduit sweeps and long-radius elbows whenever possible.

F. Pathway Installation in Communications Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits three inches above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

G. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.
3.4 INSTALLATION OF CABLES

A. Comply with NECA 1.

B. General Requirements for Cabling:

2. Comply with BICSI ITSIM, Ch. 6, "Cable Termination Practices."
3. Install 110-style IDC termination hardware unless otherwise indicated.
4. MUTOA shall not be used as a cross-connect point.
5. Consolidation points may be used only for making a direct connection to telecommunications outlet/connectors:
   a. Do not use consolidation point as a cross-connect point, a patch connection, or for direct connection to workstation equipment.
   b. Locate consolidation points for UTP at least 49 feet from communications equipment room.
   c. Terminate conductors; no cable shall contain unterminated elements. Make terminations only at indicated outlets, terminals, cross-connects, and patch panels.
6. Cables may not be spliced. Secure and support cables at intervals not exceeding 30 inches and not more than six inches from cabinets, boxes, fittings, outlets, racks, frames and terminals.
7. Install lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to smaller radii than minimums recommended by manufacturer.
8. Bundle, lace and train conductors to terminal points without exceeding manufacturer's limitations on bending radii, but not less than radii specified in BICSI ITSIM, "Cabling Termination Practices" Chapter. Install lacing bars and distribution spools.
9. Do not install bruised, kinked, scored, deformed or abraded cable. Do not splice cable between termination, tap, or junction points. Remove and discard cable if damaged during installation and replace it with new cable.
10. Cold-Weather Installation: Bring cable to room temperature before dereeling. Heat lamps shall not be used for heating.
11. Install a 10-foot-long service loop on each end of cable in the communications equipment room.
12. Pulling Cable: Comply with BICSI ITSIM, Ch. 4, "Pulling Cable." Monitor cable pull tensions.

C. UTP Cable Installation:

2. Do not untwist UTP cables more than 1/2 inch from the point of termination to maintain cable geometry.
D. Open-Cable Installation:
   1. Install cabling with horizontal and vertical cable guides in telecommunications spaces with terminating hardware and interconnection equipment.
   2. 
   3. Suspend UTP cable not in a wireway or pathway a minimum of eight inches above ceilings by cable supports not more than 60 inches apart.
   4. Cable shall not be run through structural members or in contact with pipes, ducts, or other potentially damaging items.

E. Installation of Cable Routed Exposed under Raised Floors:
   1. Install plenum-rated cable only.
   2. Install cabling after the flooring system has been installed in raised floor areas.
   3. Coil cable six feet long, not less than 12 inches in diameter below each feed point.

F. Outdoor Coaxial Cable Installation:
   1. Install outdoor connections in enclosures complying with NEMA 250, Type 4X. Install corrosion-resistant connectors with properly designed O-rings to keep out moisture.
   2. Attach antenna lead-in cable to support structure at intervals not exceeding 36 inches.

G. Group connecting hardware for cables into separate logical fields.

H. Separation from EMI Sources:
   1. Comply with BICSI TDMM and TIA/EIA-569-A for separating unshielded copper voice and data communication cable from potential EMI sources, including electrical power lines and equipment.
   2. Separation between open communications cables or cables in nonmetallic raceways and unshielded power conductors and electrical equipment shall be as follows:
      a. Electrical Equipment Rating Less Than 2kVA: A minimum of five inches.
      b. Electrical Equipment Rating Between 2 and 5kVA: A minimum of 12 inches.
      d. Separation between communications cables in grounded metallic raceways and unshielded power lines or electrical equipment shall be as follows:
      e. Electrical Equipment Rating Less Than 2kVA: A minimum of 2-1/2 inches.
      f. Electrical Equipment Rating Between 2 and 5kVA: A minimum of six inches.
      g. Electrical Equipment Rating More Than 5kVA: A minimum of 12 inches.
      h. Separation between communications cables in grounded metallic raceways and power lines and electrical equipment located in grounded metallic conduits or enclosures shall be as follows:
      i. Electrical Equipment Rating Less Than 2kVA: No requirement.
j. Electrical Equipment Rating Between 2 and 5kVA: A minimum of three inches.

3. Separation between Communications Cables and Electrical Motors and Transformers, 5kVA or HP and Larger: A minimum of 48 inches.
4. Separation between Communications Cables and Fluorescent Fixtures: A minimum of five inches.

3.5 FIRESTOPPING

A. Comply with TIA/EIA-569-A, Annex A, "Firestopping."

B. Comply with BICSI TDMM, "Firestopping Systems" Article.

3.6 GROUNDING

A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.

B. Comply with ANSI-J-STD-607-A.

C. Locate grounding bus bar to minimize the length of bonding conductors. Fasten to wall allowing at least two-inch clearance behind the grounding bus bar. Connect grounding bus bar with a minimum No. 4 AWG grounding electrode conductor from grounding bus bar to suitable electrical building ground.

D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.7 IDENTIFICATION

A. Identify system components, wiring, and cabling complying with TIA/EIA-606-A. Comply with requirements for identification specified in Section 260553-Identification.

1. Administration Class: 1.

2. Color-code cross-connect fields. Apply colors to voice and data service backboards, connections, covers and labels.

B. Using cable management system software specified in Part 2, develop Cabling Administration Drawings for system identification, testing and management. Use unique alphanumeric designation for each cable and label cable, jacks, connectors and terminals to which it connects with same designation. Cable and asset management software shall reflect final as-built conditions.

C. Paint and label colors for equipment identification shall comply with TIA/EIA-606-A for Class 2 level of administration.
D. Cable Schedule: Post in prominent location in each equipment room and wiring closet. List incoming and outgoing cables and their designations, origins and destinations. Protect with rigid frame and clear plastic cover. Furnish an electronic copy of final comprehensive schedules for project.

E. Cabling Administration Drawings: Show building floor plans with cabling administration-point labeling. Identify labeling convention and show labels for telecommunications closets; backbone pathways and cables; entrance pathways and cables; terminal hardware and positions, horizontal cables, work areas and workstation terminal positions; grounding buses and pathways; and equipment grounding conductors. Follow convention of TIA/EIA-606-A. Furnish electronic record of all drawings in software and format selected by Owner.

F. Cable and Wire Identification:

1. Label each cable within four inches of each termination and tap where it is accessible in a cabinet, junction or outlet box, and elsewhere as indicated.
2. Each wire connected to building-mounted devices is not required to be numbered at device if color of wire is consistent with associated wire connected and numbered within panel or cabinet.
3. Exposed Cables and Cables in Cable Trays and Wire Troughs: Label each cable at intervals not exceeding 15 feet.
4. Label each terminal strip and screw terminal in each cabinet, rack or panel.
   a. Individually number wiring conductors connected to terminal strips, and identify each cable or wiring group being extended from a panel or cabinet to a building-mounted device with name and number of particular device shown.
   b. Label each unit and field within distribution racks and frames.
   c. Identification within Connector Fields in Equipment Rooms and Wiring Closets: Label each connector and each discrete unit of cable-terminating and connecting hardware. Use a different color for jacks and plugs of each service where similar jacks and plugs are used for both voice and data communication cabling.
5. Uniquely identify and label work area cables extending from the MUTOA to the work area. These cables may not exceed the length stated on the MUTOA label.

G. Labels shall be preprinted or computer-printed type with printing area and font color that contrasts with cable jacket color, but still complies with requirements in TIA/EIA-606-A. Cables use flexible vinyl or polyester that flex as cables are bent.
3.8 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner’s maintenance personnel in cable-plant management operations, including changing signal pathways for different workstations, rerouting signals in failed cables, and keeping records of cabling assignments and revisions when extending wiring to establish new workstation outlets.

END OF SECTION
SECTION 31 00 00

EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, but is not limited to:
   1. Site grading, excavation, trenching, embankment, fill and backfill material and placement, and stabilization of areas.
   2. Importing required materials.
   3. Removing and disposing materials from the site that are either:
      a. Not approved for use, or;
      b. Are in excess of that required.
   4. Moisture conditioning
   5. Stockpiling and protection of materials.
   6. Rockery.
   7. Coordination of utility Earthwork operations with the site Earthwork operation and other Work of the Project.
   8. Geotechnical information for the project site.

1.2 REFERENCES

A. Reference the following standards:
   AHJ Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited to City of Kirkland, Ecology.
   COK City of Kirkland Standard Plans
   WSDOT Washington Department of Transportation 2018 Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction
   WISHA Washington Industrial Safety and Health Act. Revised Code of Washington (RCW) Chapter 49.17
   WAC 296-155 Washington Administrative Code (WAC) 296-155 Standards for Construction Work
   RCW Chapter 39.04.180 Public Works/Trench Excavations – Safety Systems Required

9/30/19
1.3 SUBMITTALS

A. Submit the following documents in accordance with submittal procedures noted in Division 01:

1. Gradation and moisture-density relation test results for each type of fill and backfill material at least 10 working days prior to their delivery at the site. Test results shall demonstrate that materials meet the criteria defined in Part 2 of this Section.
2. Samples of materials proposed for use as fill or backfill and the source location of each material.
3. Field compaction test results to the Owner’s Representative at the end of each day.
4. Manufacturer certification that the organic compost material meets the Specifications in Part 2 of this Section, including certified laboratory test results dated within 90 days of submittal.
5. Organic content test results demonstrating the organic soil mixture meets the requirements specified.

1.4 NOTIFICATIONS

A. Notify the Owner’s Geotechnical Engineer Representative five working days in advance of delivering fill and/or backfill materials to the site.

1.5 QUALITY ASSURANCE

A. Testing:

1. Contractor shall provide their own testing service to confirm compliance with Specifications and provide measures for confirming Quality Control.
2. Owner’s Geotechnical Engineer Representative will take samples and perform moisture content, gradation, compaction and density tests during placement of backfill materials to check compliance with these Specifications. Contractor shall coordinate with Owner’s Geotechnical Engineer Representative on schedule of Work and timing of testing.
3. The Contractor shall remove surface material at locations designated by the Owner’s Geotechnical Engineer Representative and provide such assistance as necessary for sampling and testing. The Owner’s Geotechnical Engineer Representative may direct the Contractor to construct inspection trenches in compacted or consolidated backfill to determine that the Contractor has complied with these Specifications.
4. Testing by the Owner’s Geotechnical Engineer Representative does not relieve the Contractor of responsibility to determine, to Contractor’s own satisfaction, when and if Contractor's Work meets the Specification.
5. Test will be made by the Owner’s Geotechnical Engineer Representative for the following items:

   a. Moisture content: ASTM D 2216
   b. Gradation: ASTM D422 and ASTM C136

9/30/19
c. Density in-place and moisture content: ASTM D2922 and ASTM D3017

d. Moisture-density relationships: ASTM D1557, every 2,000 cy, or when material changes, whichever occurs first.

6. The minimum amount of testing to be performed and submitted by the Contractor, unless determined otherwise by Owner’s Geotechnical Engineer, shall be as follows:

   Item & Frequency of Tests
   Utility Trenches
   One density test per 200 cubic yards of backfill, OR one test for each lift of backfill for each 200 hundred lineal feet of utility trench, whichever results in the greater number of tests.

   Backfilling and Paved Areas
   One density test in every three hundred cubic yards of fill or backfill, OR one test for each lift of compacted fill over 1,000 square feet of compacted fill or backfill surface, whichever results in the greater number of tests.

   Compaction tests are required to be performed the same day that the compaction effort is performed regardless of the volume or area of material.

   This minimum amount of testing does not relieve the Contractor of responsibility to determine, to Contractor’s own satisfaction, when and if Contractor’s Work meets the Specifications.

7. The frequency of tests shown above shall govern the actual quantity of tests. Any re-testing that is required due to failure of initial test to show compliance with these Contract Documents shall be provided and paid for at the Contractor's sole expense.

8. Contractor shall submit reports (three copies) conducted by an independent firm to the Owner’s Representative indicating observations and results of the tests, and indicating compliance or non-compliance with Contract Documents.

9. Coordinate testing requirements and scheduling with the Owner’s Geotechnical Engineer Representative, and assist independent testing firm during field testing and sampling at no additional cost to Owner.

1.6 DIMENSIONS AND LAYOUTS

A. Contractor shall provide all layout required for construction.

B. Furnish, set and mark line and location stakes, including offsets and general construction staking. There shall be onsite at all times when Work requiring control is being performed, necessary equipment, supplies and instruments related thereto. A qualified layout engineer, professional Washington State Licensed Land 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 the site.

C. Preserve benchmarks and stakes, and replace any that are displaced or missing.

D. Review all utility purveyor, Owner and State records relative to the existing underground utilities. Avoid damage to these facilities and restore utilities at no cost to Owner.

E. Notify Owner’s Representative immediately if underground utilities not shown on Plans or Record Documents are encountered.

F. Verify existing location and elevation at connection points of existing utility structures (including pipes) prior to construction of new system. If discrepancies are found, notify Owner’s Representative.

1.7 GEOTECHNICAL REPORT

A. Contractor is responsible for reviewing available data for the site. Reports available for review without warranty, expressed or implied, as to its accuracy include the following:


PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Fill: Conform to WSDOT Section 9-03.14(1) - Gravel Borrow.

B. Drain Rock: Conform to ¾-inch to ½-inch washed gravel with less than three-percent passing the U.S. No. 200 sieve; AASHTO 57; or Owner’s Geotechnical Engineer’s approved equivalent product.

C. Crushed Surfacing:

1. Crushed Surfacing Base Course shall conform to WSDOT Section 9-03.9(3).
2. Crushed Surfacing Top Course shall conform to WSDOT Section 9-03.9(3).

D. Common Fill: Consist of granular and nongranular soil and/or aggregate that is free of deleterious material and does not contain wood, plastic, organic waste, clay, frozen lumps concrete, asphalt or any other deleterious, extraneous or objectionable material. Material shall have a maximum particle size of two inches. Material shall not contain more than 3 percent organic material by weight. On site soils may be suitable for use as Common Fill depending upon weather conditions and moisture conditioning (either drying or wetting) may be required to achieve proper moisture content of compaction. The Owner does not warrant that any of the on-site material can be used as Common Fill. The material shall be capable of being compacted as specified under the weather conditions.
conditions prevailing at the time of construction. The material shall be within +/- two percent of the optimum moisture as determined by ASTM D1557 test method (modified proctor) prior to compaction. If common fill material is imported then it shall be meet the requirements for borrow in accordance with WSDOT Section 9-03.14(3).

E. Fill in Critical Root Zones (CRZ) shall be topsoil.

F. Pipe Bedding: Conform to City of Kirkland Standard Plans.

G. Pipe Backfill: Conform to City of Kirkland Standard Plans

H. Gravel Backfill for walls: Conform to WSDOT Section 9-03.12(2).

I. Conductive Warning Tape: Shall be manufacturer’s standard, permanent, brightly colored, continuous printed plastic tape with aluminum backing; intended for burial in pipe backfill; and not less than six inches wide and four mils thick. Tape schedule shall be:

<table>
<thead>
<tr>
<th>Pipe Type</th>
<th>Color</th>
<th>Wording</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic Water</td>
<td>Blue</td>
<td>Caution Domestic Water</td>
</tr>
<tr>
<td>Irrigation Water</td>
<td>Blue</td>
<td>Caution Irrigation Water</td>
</tr>
<tr>
<td>Storm Drain</td>
<td>Green</td>
<td>Caution Storm Drain</td>
</tr>
<tr>
<td>Sanitary Sewer</td>
<td>Green</td>
<td>Caution Sanitary Sewer</td>
</tr>
</tbody>
</table>

J. Filter Fabric or Geotextile fabric shall conform to Mirafi 140N or an approved equivalent product.

K. Clean Sand: For filler use natural deposit angular grain per WSDOT.

L. Backfill for demolished utilities excavation and demolished structures and buildings shall be Structural Fill.

M. Cobbles: Cobbles shall conform to WSDOT Section 9-03.11(2). Use well-graded washed cobblestone rock or an approved equivalent product in the sizes indicated in the Contract Documents. Cobbles shall not be procured from natural stream bed channels.

PART 3 - EXECUTION

3.1 GENERAL

A. Protect existing trees to be saved from damage during construction in accordance with Section 01 56 39 - Tree Protection and this Section.

B. Protect existing structures, areas, utilities and other facilities from damage during construction in accordance with Section 31 10 00 - Site Preparation, including, but not limited to:
   1. Verify the presence and locations of existing underground utilities.
2. Notify the Owner’s Representative immediately if underground utilities not shown on the Contract Documents are encountered.
3. Repair structures, areas, utilities and other facilities damaged by construction activities to restore them to the condition existing prior to construction as directed by the Owner’s Representative and at no additional cost to the Owner.
4. Provide (including AHJ permitting, if required, and design) interior and exterior shoring, bracing or support to prevent movement, settlement or collapse of adjacent facilities to remain including but not limited to utility poles, pavement, trees, retaining walls, utility structures, building foundations, etc. Contact facility owner to determine existing loads on the facility and any additional constraints the shoring, bracing or support design must incorporate. Comply with WISHA, WAC 296-155, and local codes and ordinances having jurisdiction.

C. Furnish, set and mark all alignments, line and location stakes, including offsets and other construction staking.

1. Assign a licensed surveyor to complete this work and certify the accuracy of work.
2. Have necessary equipment, supplies and instruments onsite always when work requiring control is being performed.

D. Sprinkle water as necessary to control dust during dry weather conditions. Do not use water to extent that could cause flooding, contaminated runoff, excessive moisture content of soil to be reused, or have other adverse effects.

3.2 EXCAVATION

A. Excavate to the lines and grades and at the locations shown on the drawings, including trenches for piping.

1. Conform to elevations and dimensions shown within a tolerance of 0.10-foot.
2. Properly prepare subgrade by removing unstable, soft, weak, or loose debris, clods, and other deleterious materials from excavations to expose firm soil. Replace with compacted Structural Fill unless otherwise specified by the Owner’s Representative.
3. Slope and/or shore the sides of excavations and trenches to comply with WISHA, WAC 296-155 and local codes and ordinances having jurisdiction. Maintain sides and slopes of excavations in a safe manner until backfilling is complete.

B. Trench Subgrade Preparation:

1. Grade and smooth bottoms of trenches to provide uniform bearing and support of pipe.
2. Remove rocks and other materials that could cause point loads on the pipes.
3. Form bell holes and depressions sized only as needed to fit the particular type of pipe joint.

C. Catch basins, maintenance holes/manholes, and similar embedded structures:
1. Excavate a minimum 12 inches between excavation walls and sides of structures and, if prefabricated, four inches below the base of structures to allow for leveling.
2. Remove unsuitable material as described in this Section.
3. Backfill over excavations in the subgrade with compacted Structural Fill.

D. Dewater as necessary to keep excavations and construction areas in a dry condition. Promptly remove water to prevent softening or disturbance of subgrade surfaces.

E. Where final excavation grades are disturbed by construction activities, over excavate disturbed material and backfill to grade using compacted Structural Fill at no additional cost to the Owner.

F. Remove and properly dispose of excess excavated material and debris offsite at no additional cost to Owner.

G. Backfill excavations as promptly as construction work allows and after the Owner’s Geotechnical Engineer Representative has viewed the prepared subgrade surfaces.

3.3 FILL AND BACKFILL PLACEMENT

A. General:

1. Lightly scarify properly prepared subgrade surfaces that will receive backfill or fill, except for trenches. Moisture-condition the scarified soil to obtain soil moisture near optimum moisture content.
2. Do not place backfill or fill material on surfaces that are soft, muddy, frozen, or containing frost, ice or loose debris or soil.
3. Place backfill and fill in controlled layers of the thickness that is compatible with the type of compaction equipment used.
   a. The loose thickness of each fill or backfill layer shall not exceed 12 inches.
   b. Compact each layer to the minimum relative compaction as listed in this Section.
   c. When placing fill on sloped surfaces, notch fill lifts into subgrade and work thoroughly to destroy interfaces that may otherwise develop.

B. Pipe Bedding:

1. Place and compact pipe bedding in accordance with COK to provide uniform support along the entire pipe barrel, without load concentrations at joint collars or bells. Do not use blocking to adjust the pipe to grade except when the pipe is embedded in concrete.
2. Form bell holes and depressions in the bedding only as needed to provide uniform support along the pipe barrel.
3. Take special care to provide uniform and adequate bedding support at pipe connections and adjacent to manholes or other structures to avoid inducing stresses that could damage the pipe or adjacent manhole or other structure.
4. Recompact, or replace and recompact if necessary, bedding that is disturbed or contaminated by removal of temporary shoring, trench boxes or other construction activity at no additional cost to the Owner.

C. Pipe Backfill:

1. Backfill pipe trenches as soon as possible after pipe installation.
   a. Place and compact pipe backfill in accordance with WSDOT Section 7 for the specific type of pipe and conditions.

2. Protect the pipe from damage or shifting alignment during backfill placement.
   a. Do not backfill near catch basins, manholes or similar structures until mortar has thoroughly hardened.
   b. Carefully place backfill over the pipe to a depth of two feet above the pipe crown before beginning compaction.
   c. Subsequent lifts shall not exceed 12 inches loose thickness. Each lift shall be compacted with mechanical equipment.
   d. Do not walk on the pipe until the backfill has reached a uniform depth of one-foot above the crown of the pipe.
   e. Pipe damaged during backfill placement shall be replaced at no additional cost to the Owner.

3. Place backfill to achieve the minimum cover thicknesses specified for the type of pipe and conditions in accordance with COK.

4. Place conductive warning tape continuously along the alignment of the pipe crown at a depth no less than two feet above the pipe and embedded in backfill at least one-foot below finished grade.

D. Fill in Tree Critical Root Zones:

1. Do not use heavy equipment in critical root zones of trees. Hand compact where feasible. See Section 01 56 39 for additional information.

2. Material shall be per this Section.

3. Place material from equipment that is staged outside of the critical root zone (CRZ).

4. Rake to grade fill zones in lifts.

E. Moisture Conditioning

1. Shall be performed for fill and backfill materials as needed to meet the compaction requirements specified in this Section. Moisture conditioning includes drying and wetting of fill and backfill materials as needed, and it shall be performed at no additional cost to the Owner.

2. Chemical soil amending such as soil cements, fly ash, lime, etc. shall not be used to moisture condition.

3. Apply water uniformly to soil where subgrade or fill material is moisture conditioned before compaction. Prevent free water from appearing on surface during or subsequent to compaction operations.
4. Remove, replace, scarify or air dry soil material too wet to permit compaction to specified density.
5. Removed soil material that is too wet for compaction may be temporarily stockpiled until removed from site, or spread to allow for drying. However, if material cannot be adequately moisture conditioned, the Contractor shall be responsible for removing material from site at no additional cost to Owner.

F. Compaction:

1. Compact fill and backfill using compaction equipment that can achieve the specified compaction criteria and that is appropriate to the soil type being compacted.
   a. Water settling or jetting is not permitted as a means of compaction.
   b. Around foundation and subgrade drains, compact backfill to a non-yielding condition without damaging the filter fabric or pipe. Repair damaged filter fabric or pipe at no additional cost to the Owner.
   c. Hand compact in CRZ of trees or as approved by the Owner’s Arborist.
   d. Within five feet of retaining walls or foundations, use hand-operated equipment to avoid overstressing the walls. Repair or replace walls damaged by improper compaction or other construction activities at no cost to the Owner and as directed by the Owner’s Geotechnical Engineer Representative.

2. Compact fill and backfill to a dense and unyielding condition and to the following minimum relative compaction based on the percentage of maximum dry density as determined in accordance with ASTM D 1557, unless otherwise specified.

<table>
<thead>
<tr>
<th>Locations</th>
<th>Relative Compaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipe bedding</td>
<td>95%</td>
</tr>
<tr>
<td>Pipe backfill (non-vehicle areas)</td>
<td>90%</td>
</tr>
<tr>
<td>Pipe backfill (in vehicle and/or paved areas)</td>
<td>95%</td>
</tr>
<tr>
<td>Under slabs-on-grade</td>
<td>95%</td>
</tr>
<tr>
<td>Under foundations</td>
<td>95%</td>
</tr>
<tr>
<td>Retaining Walls and foundations (beyond 5 feet of wall face)</td>
<td>95%</td>
</tr>
<tr>
<td>Under driveways, aprons and vehicle areas</td>
<td>95%</td>
</tr>
<tr>
<td>Under walks</td>
<td>92%</td>
</tr>
<tr>
<td>Under stairs</td>
<td>95%</td>
</tr>
<tr>
<td>Landscape areas</td>
<td>80-85%*</td>
</tr>
<tr>
<td>Other non-structural-bearing areas</td>
<td>90%</td>
</tr>
<tr>
<td>Other structural-bearing areas</td>
<td>95%</td>
</tr>
</tbody>
</table>

* For landscape areas the relative compaction shall be within the range noted above and not exceed the maximum.

3.4 SOIL STOCKPILES

A. Maintain separate stockpiles for various soil materials. Label each stockpile with weatherproof sign as to material type.
B. Shape and arrange soil stockpiles to promote drainage.

C. Use TESC measures to filter sediment from stormwater runoff from stockpiles and implement flow diversion and energy dissipation measures to safely direct water downstream to TESC treatment system. Runoff from stockpiles shall under no circumstances sheet-flow or direct-flow to existing trees to remain, to adjacent offsite properties, and to new and existing facilities to remain.

D. Cover temporary stockpiles in accordance with Section 01 57 13 – Temporary Erosion and Sediment Control. Material that becomes unsuitable due to lack of protection measures being installed by Contractor shall be hauled and legally disposed of offsite and replaced with suitable material at no additional expense to the Owner.

E. Unsuitable material stockpiles shall be removed, hauled and properly disposed of offsite.

3.5 GRADING

A. Shape surface of site to match contours, grades, spot elevations, profiles and slopes shown on the Contract Documents to a tolerance of 0.05-foot plus or minus over a 10-foot horizontal distance and to maintain positive drainage.

1. Should indicated figures conflict with actual conditions, notify Owner's Representative and obtain direction before proceeding with grading of affected area.
2. In landscaped areas, leave final surfaces rough or scarified to a depth of at least four inches to prepare for topsoil placement. Coordinate with landscape planting soil preparation requirements.
3. Remove all concrete, rocks, rubble and debris larger than four inches from finished surfaces.
4. Finish grades flush with adjacent surfaces unless otherwise specified.
   a. Adjust finished grades as necessary to provide depth for soil amendments and other components of landscaping
   b. Construct finish grades adjacent to sidewalks to be ½-inch below elevation of sidewalk unless otherwise specified.
   c. Grade transition areas to provide a smooth surface free of discontinuities.
5. Do not allow grades to exceed maximum slopes in ADA accessible routes and areas.

B. Protect finished surfaces.

1. Where finished surfaces are disturbed (e.g. loosened soil, ruts, holes, etc.) by construction activities, over-excavate disturbed material and backfill to final grade at no additional cost to the Owner.
   a. Overexcavate to the depth and extent as directed by the Owner's Geotechnical Engineer's Representative.
b. Backfill with Structural Fill or other material as directed by the Owner’s Representative, and in lift thickness and to the compaction criteria established by the Owner’s Geotechnical Engineer’s Representative.

2. Repair areas showing settlement at no cost to Owner.
3. Repair areas with any obstructions to positive drainage.

3.6 WET WEATHER PROVISIONS

A. Schedule earthwork operations to minimize the potential for erosion, siltation, and disturbance of site soils.

B. Perform earthwork operations in discrete areas to minimize the exposure of disturbed soils to wet weather.

C. Protect exposed subgrade for utility trenches, structures and paving.
   1. Compact exposed soil to reduce the infiltration of rainwater.
   2. Implement measures to protect suitable exposed road, paving and structure subgrade from wet and/or rainy weather. If exposed subgrade is left unprotected to wet and/or rainy weather and becomes unsuitable as determined by Owner’s Geotechnical Engineer’s Representative, unsuitable material shall be over-excavated and properly hauled and disposed of offsite and replaced with Structural Fill at no additional expense to the Owner.

D. Direct surface water away from fill areas, protected trees, structure, trench excavations, buildings, excavations, adjacent properties and public right-of-way.

E. Protect and cover soil stockpiles with plastic or other measures to prevent infiltration and erosion.

F. Dewater as needed to keep excavations and construction areas free of water.

G. Replace or rework soil that has not been protected in accordance with the requirements of these Contract Documents; and remove and replace, as specified in this Section, soil that becomes too wet for compaction, as directed by the Owner’s Geotechnical Engineer’s Representative and at no additional cost to the Owner.

3.7 DISPOSAL OF EARTH MATERIALS

A. Remove all excavated material not acceptable for use as fill onsite. Legally dispose of excess material offsite at Contractor’s expense.

END OF SECTION

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SECTION 31 10 39
SITE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, but is not limited to:
   - Location of utilities
B. Clearing, grubbing, stripping and removing and disposing of debris.
C. Protection of existing features and structures, related activities, and other preparatory work.
D. Remove and dispose of materials from site.
E. Identify, disconnect, cap and remove utilities as required.
F. Remove vegetation, trees and other unwanted materials.
G. Verification of project limits
H. Coordination with Section 01 57 13 - Temporary Erosion and Sedimentation Control.
I. Coordination with Section 01 56 39 – Tree, Plant and Soil Protection

1.2 REFERENCES

A. Reference the following standards:
   - AHJ Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited City of Kirkland, Ecology.
   - COK City of Kirkland Standard Plans.
   - WSDOT Washington Department of Transportation 2018 Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction
1.3 SUBMITTALS

A. Submit the following documents in accordance with submittal procedures noted in Division 01:

1. Copies of permits for transport and disposal of debris as required.
2. Copies of permits associated with earthwork and construction.
3. Copies of a recycling program for land clearing debris that identifies types of materials to be recycled, and handling, storage, and shipping procedures.
4. Dated checklist showing utility service stubs and points of connections have been located and elevations verified.
5. In accordance with Division 01, submit Record Drawings indicating locations of demolished utilities, and remaining active utility lines and related appurtenances.
6. Dated photographs or videotape, sufficiently detailed, of existing conditions of trees and plantings, adjoining construction, and site improvements that might be misconstrued as damage caused by site clearing, demolition and construction.

1.4 ACCESS

A. Maintain vehicular and pedestrian traffic routes.

1. Minimize interference with public use of roads, streets, alleys, sidewalks, and adjacent facilities.
2. If required by governing authorities, provide alternate routes around closed or obstructed traffic ways including for ADA.
3. Do not close or obstruct streets, fire lanes, sidewalks, alleys or passageways without permission from Owner, City and Authorities Having Jurisdiction.

1.5 COORDINATION

A. Protection of existing conditions: Provide, erect, and maintain barricades, coverings and other types of protection measures necessary to prevent damage to existing trees, structures, utilities, landscaping, and other features to remain in place. Restore any improvements damaged by this Work to their original condition or better, as acceptable to the Owner.

B. Contact and coordinate with utility companies and request meter readings, utility cutoffs and meter and line removals. Verify that all appropriate services have been disconnected. Contractor shall pay for all fees and costs associated with utility disconnects, capping, and line and meter removals.

C. Verify existing utility locations and elevations at least 10 working days in advance of construction and demolition.

1. Contact the underground location center to locate and mark utilities not less than four business days, and not more than ten business days before beginning demolition or Earthwork.
2. Compare existing utility locations and elevations with drawings and new utilities.
3. Immediately notify Owner’s Representative of potential conflicts to allow for mitigation without down time.

D. Public and private utilities shall remain in service unless otherwise noted on the Contract Documents.

1. Notify underground utility owners at least three working days in advance of excavation and in accordance with RCW Chapter 19.122 and WSDOT Section 1-07.17.
2. Coordinate with utility companies to shut off or cap services that are to be disconnected.
3. Provide schedule of excavation to underground utility owners in accordance with RCW 19.122.
4. Do not shut off or cap utilities without prior notice to Owner’s representative.
5. Pay fees and costs associated with utility disconnects, capping, line and meter removals. Provide temporary bypass and/or temporary services as necessary to minimize interruptions. Do not shut off or cap utilities without prior notice. Keep site utilities in service unless otherwise indicated. Notify property owners of properties affected, Owner and utility providers in writing a minimum of five working days in advance of utility service interruptions. Coordinate with Owner, property owners of properties affected and utility providers.
6. Verify that temporarily shut off utilities are restored.
7. Provide written notification five days in advance of utility service interruptions.

E. Construct temporary erosion and sediment control (TESC) plan in accordance with Section 01 57 13 – Temporary Erosion and Sedimentation Control. Maintain street drains and sewers clear and free of debris to allow stormwater to be collected and conveyed.

F. Preserve and maintain benchmarks, control points and stakes, and other reference points, unless otherwise approved by the Owner’s Representative.

G. Repair and/or restore utilities, benchmarks, stakes and control points and other site structures and features designated as protected or outside construction limits, if damaged by construction activities, at no cost to the Owner and as directed by the Owner’s Representative.

H. Objectionable Noises: Limit use of air hammers and other noisy equipment as much as possible. Conform to local governing requirements regarding noise control.

I. Provide (including AHJ permitting, if required, and design) interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of adjacent facilities and structures to remain including but not limited to utility poles, trees, retaining walls, rockeries, utility structures, building foundations, etc. Contact facility owner to determine existing loads on the facility and any additional constraints the shoring, bracing or support design must incorporate. Comply with WISHA, WAC 296-155, and local codes and ordinances having jurisdiction.

9/30/19
PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 GENERAL

A. Obtain required permits and permission from local governing authorities and Owner prior to commencing Work.

B. Arrange a preconstruction meeting with COK and notify Owner of date, time and meeting place location.

C. Before construction and mobilizing to the site, meet with the Owner’s Representative and review Contract Documents on site.
   1. Identify existing trees, utilities, and other site improvements that may be affected by construction.
   2. Identify trees, structures and other features to be left undisturbed.

D. Provide, erect and maintain barricades, coverings, flagging or other types of protection necessary to prevent damage to existing structures, areas, utilities, vegetation, and other facilities or features.
   1. Restore existing facilities or features damaged by construction activity to their original condition as acceptable to the Owner, including, but not limited to, landscaping, rockeries, walls, pavement, walks, structures, utilities, fences and planters, and at no additional cost to the Owner.

E. Install temporary erosion and sediment control in accordance with Section 01 57 13 - Temporary Erosion and Sediment Control and the Contract Documents.

F. Verify that clearing, grubbing, stripping and demolition and site improvements may safely and appropriately begin.

G. Locate existing utilities within the project limits.

H. Maintain hauling routes clean and free of debris resulting from Work on this Project.

I. Sprinkle water as necessary to limit dust to the lowest practicable level. Do not use water to such an extent to cause flooding or icing.

J. Properly recycle and dispose of refuse, debris and excess materials resulting from work in accordance with applicable federal, state, and local regulations and requirements. Do not leave these materials on the project site, unless authorized in writing by Owner’s Representative.
3.2 TREE PROTECTION
A. Preserve and protect existing trees and vegetation in accordance with other Sections of the Project Manual and as shown on the Contract Documents.

3.3 EROSION CONTROL
A. Construct and maintain the TESC system in accordance with Section 01 57 13 Temporary Erosion and Sedimentation Control, local governing authorities and as conditions dictate.

3.4 CLEARING
A. Remove surface debris, vegetation, underbrush and other deleterious material within areas to be graded, as required for new construction and as indicated. Removal operations shall be performed in a manner to protect property.

1. All trees larger than two-inch caliper designated for removal shall be flagged for approval of Owner prior to demolition or removal. Notify Owner’s Representative at least five business days in advance of scheduled tree removal.
2. Cut stumps and other growth flush with or below original grade surface.
3. Completely remove all growth.

B. Protect all offsite trees along adjacent roadways and on surrounding properties.

C. Clear around trees designated to remain in accordance with tree protection requirements specified in Division 01.

3.5 STRIPPING AND GRUBBING
A. In areas to be graded, as required for new construction and as indicated, strip and grub areas to the depth necessary to remove stumps, roots, organic material, topsoil, and other deleterious material.

B. Do not strip and grub within tree protection areas or areas to remain undisturbed. Coordinate Work with Owner’s Representative within the Critical Root Zone of trees to remain.

C. Cut any abandoned utility pipes, encountered during construction, back to a minimum of two feet below finished grade and plug with grout.

3.6 SITE IMPROVEMENT REMOVALS
A. Care shall be taken that damage to the existing structures and features, such as but not limited to, utilities, pavement, fences or irrigation lines, which are to remain in place does not occur during the removal of pavement, structure, and other items and
features to be removed. All removals are accomplished by making a neat vertical saw cut at the boundaries of the area to be removed. Adjacent materials designated to remain that are damaged by the Contractor due to his or her operations shall be replaced at no additional cost to the Owner.

B. Sprinkle with water excavated material and access roads as necessary to limit dust to lowest practicable level. Do not use water to extent causing flooding, contaminated runoff or icing.

C. Utilities: Cap and remove all piping designated for removal, including underground piping and exposed piping.
   1. Piping:
      a. Some utility piping and structures are to remain until new services are in operation, and shall be protected during construction. Damage to existing utilities that are to remain shall be repaired at the Contractor’s expense.
      b. In the event the Contractor encounters utility lines not shown on the drawings, 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.

3.7 DRAINAGE

A. Keep street and site drains open for drainage at all times. Mud/sediment build-up shall be removed.

B. Open pits and holes caused as a result of demolition Work shall be kept free of standing water.

3.8 FILLING DEPRESSIONS

A. Fill depressions caused by clearing, grubbing, and utility removal operations with Structural Fill material unless further excavation or Earthwork is indicated. Structural Fill shall be in accordance with Section 31 00 00 - Earthwork.

3.9 DISPOSAL OF MATERIALS

A. The Contractor, in a manner consistent with all government regulations, shall dispose of the refuse resulting from clearing, stripping and grubbing. In no case shall refuse material be left on the Project Site, shoved onto abutting private properties, or be buried in embankments or trenches on the Project Site. Debris shall not be deposited 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. Maintain hauling routes clean and free of any debris resulting from Work of this Section.

END OF SECTION

9/30/19
PART 1 - GENERAL

1.1 DESCRIPTION:

A. This work is for concrete curbs, pavements, and sidewalks shown on the Drawings. Furnish all material, labor, services and related items required to complete concrete paving work indicated on drawings and/or specifications. The items of work to be performed shall include but are not necessarily limited to:

B. Concrete flatwork, slabs, sidewalks, curbs, sleeving under pavement, and associated work.

1.2 REFERENCES:

A. This section references the latest revisions of the following documents. They are a part of this section as specified and modified. In case of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail. Other references are as follows:

- AASHTO American Association of State Highway and Transportation Officials “Standard Specifications for Highway Materials and Methods of Sampling and Testing”.
- COK City of Kirkland Standard Plans

1.3 SUBMITTALS:

A. The Contractor shall submit to the Engineer materials containing the following information:

B. Procedures to be used in the construction under this Section with regard to the division of labor and the responsibilities of the Contractor and all sub-contractors involved.

C. Furnish samples, manufacturer's product data, test reports, and materials certifications for Portland cement products, expansion joint materials, fillers, sealants, etc.

D. Construction, Control and Scoring Joint Layout Plan for paving areas. Include final as-built location of all protrusions through proposed pavement such as utility access lids and covers and other structures in submitted joint layout plan. Show scoring layout with joints on a site plan with a scale of one-inch = 20 feet or one-inch=10 feet.
1.4 QUALITY ASSURANCE:

A. The Contractor shall provide, at the request of the Engineer, original supplier invoices for concrete. Concrete found not to be consistent with these specifications shall be removed from the project site(s) unless otherwise approved by the Engineer. The Engineer may copy the original invoices and then return them to the Contractor in a timely manner.

B. Prior to commencing the work of this Section, the Contractor shall verify the accuracy of layout and grading. Verify that all sub-grade and base course aggregate conditions are as specified. Notify the Engineer of any discrepancies and coordinate the correction of those discrepancies with other trades as necessary.

C. Protect all finished work. Vandalized work will be rejected by the Engineer and repaired/replaced by the Contractor at their expense, as directed by the Engineer.

PART 2 - PRODUCTS

1.01 CEMENT CONCRETE PAVEMENT:

A. Materials for concrete paving shall confirm to WSDOT Section 5-05.2.

2.2 FORMS:

A. Forms shall be made of steel, wood, or other suitable materials and shall be of size and strength to resist movement during concrete placement. Use straight forms, free of defects. Use flexible spring steel forms or laminated boards to form curved edges if specified.

2.3 CURING MATERIALS:

A. Curing shall be per WSDOT Section 5-05.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Prepare subgrade in conformance with Section 31 00 00 - Earthwork of this Project Manual.

B. Install cement concrete curb in accordance with WSDOT Section 8-04.3, and as shown on the Contract Documents.

1. Provide expansion joints at 15-foot maximum spacing.
2. Remove and replace curbs found with unsightly bulges, ridges or other defects at no additional cost to the Owner and as directed by the Owner's Representative. When checked with a 10-foot straight edge, do not deviate grade more than 1/8-inch, and do not vary alignment more than ¼-inch;
3. The finished slope and cross slope in ADA/Barrier Free routes and areas shall not exceed the maximum allowed by ADA.
4. Maximum variations in finished grade of all paving except ADA/Barrier Free routes of travel and areas shall be in accordance with WSDOT 5-04.3(13).

C. Install concrete driveways in accordance with WSDOT Section 8-06.3 and the Drawings.
   1. Provide expansion joints at 15-foot maximum spacing.
   2. Finish cement concrete pavement in driveway in accordance with WSDOT Section 8-06.3.

D. Finish cement concrete pavement in the roadway in accordance with WSDOT Section 5-05.3(11).

E. Construct walkways and sidewalks in accordance with WSDOT Section 8-14 and shown on the Contract Documents.
   1. Score and surface finish walkways outside right of way as shown on the Contract Documents.
   2. Score and surface finish public sidewalks in the right of way per City of Kirkland Standards.
   3. Provide expansion joints at 15-foot maximum spacing.
   4. Install detectable warnings in accordance with WSDOT Section 8-14, except placement shall be in fresh concrete.

3.2 FIELD QUALITY CONTROL

A. Proportion cement concrete to meet the requirement of WSDOT Section 5-05.

3.3 CURING:

A. Protect and cure finished concrete paving, complying with applicable requirements of the References specified in this Section. Use only pre-approved curing and sealing compound or moisture curing method.

3.4 CLEAN-UP:

A. Repair and replace broken or defective concrete as directed by the Engineer.

B. Protect concrete from damage until acceptance of work. Exclude traffic from pavement for at least fourteen (14) days after placement. When construction traffic is permitted by Engineer, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.

C. Sweep concrete pavement and wash free of stains, discoloration, dirt and other foreign material just prior to final inspection.
END OF SECTION
SECTION 32 18 16

SYNTHETIC GRASS SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. The Contractor shall provide all labor, materials, equipment and tools necessary for the complete installation of an infilled synthetic grass surface for the play area safety surfacing with a stable draining base and padding to meet all relevant ASTM and CPSC guidelines. The complete synthetic grass field system shall consist of, but not necessarily be limited to, the following:

1. Synthetic Grass Surfacing construction with the extent of synthetic grass system work as shown on the Contract Drawings.
2. Subgrade, safety foam pad, base, and drainage construction as specified in Part 2 and Part 3 of this document.
3. Quality synthetic grass product manufactured in the USA according to specifications in Part 2 of this document. Product shall meet or exceed all guidelines as established herein, or for characteristics not specifically stated, shall meet or exceed all guidelines published by the Synthetic Turf Council.
4. The synthetic grass surface shall be specifically designed, manufactured and installed for the intended use as a playground safety surface.
5. A resilient infill system consisting of a rounded and highly uniform quartz sand pigmented and sealed.
6. Safety foam pad will be used to provide an ASTM rated 10-foot fall height safety surface.

1.2 SYSTEM PERFORMANCE

A. Contractor shall ensure that all components and their installation method shall be designed and manufactured for use on playgrounds. The materials as hereinafter specified shall withstand full climatic exposure in the location of the playground, be resistant to insect infestation, rot, fungus, mold and mildew; it shall also withstand ultra-violet rays and extreme heat; the free flow of water vertically through the playing surface and into the drainage system below the surface:

1. The seams of all system components shall provide a permanent, tight, secure, and hazard free playing surface.
2. The installed synthetic grass and drainage system shall allow for drainage and water flow through the system at a rate of not less than 30 inches per hour.
3. At the time of substantial completion, the system’s ASTM F1292 rated surface shall have a fall height rating based on playground design up to 10’. Testing shall be based on ASTM F1292-04. At no time throughout the life of the warranty shall the fall height rating be less than the original design.

B. Based on independent laboratory tests, the synthetic grass product must be shown to meet or exceed ASTM testing standards as specified by architect or owner.

1.3 SERVICE AND QUALITY ASSURANCE
A. “Synthetic grass vendor” and/or “synthetic grass installer” shall provide ongoing service, quality assurance, and warranty consisting of, but not necessarily be limited to, the following:

1. The synthetic grass vendor must provide competent workmen skilled in this type of synthetic grass surfacing installation for use as play area safety surfacing. The synthetic grass vendor and/or synthetic grass installer shall provide a qualified installation foreman to coordinate and review the component parts of the synthetic grass system. Foreman shall be introduced to Owner or Owner’s representative prior to start of construction.

2. The synthetic grass vendor and/or synthetic grass installer must be IPEMA Certified with no less than six completed playground installations. Installer must be competent in the installation of this material, including attachment of seams and proper installation of infill material prior to the start of grass installation.

3. Accessibility of Surface Systems: ASTM F1951 ADA Compliant. Synthetic grass shall provide accessibility for mobility devices under and around all playground equipment as required by the American Disabilities Act.

4. Flammability: Synthetic Grass shall pass all required ASTM D2859 with a flash point of greater than 600 degrees F. It shall be resistant to damage and spreading of ignition in typical exposures such as lighted cigarette dropped on this surface.

5. Synthetic grass and safety pad system shall have a drain rate of 30 inches or more per hour.

6. The synthetic grass vendor shall submit its manufacturer’s warranty, which warrants the usability and playability of the synthetic grass system for its intended uses with the following minimum characteristics:
   • Provide full coverage of materials for a minimum of ten (10) years for the date of substantial completion.
   • Warrant that the materials installed meet or exceed the product specifications.
   • Be from a single source covering workmanship and all materials.
   • Assure the availability of exact or substantially the same replacement materials for the synthetic grass system for the full warranty period.
   • Include general wear and damage caused by UV degradation. The warranty may specifically exclude vandalism and Acts of God beyond the control of the manufacturer or installer.

1.4 SUBMITTALS

A. Synthetic Grass Vendor must submit the following to Owner or Owner’s Representative with the official bid package:

1. One (1) copy of the most recent installation reference list for projects of similar scope to this project completed in last three years.

2. One (1) 12”x12” loose sample of proposed synthetic grass product and one (1) 12”x12” boxed sample including infill and resilient base course representative of finished synthetic grass system.

3. One (1) copy of independent test report from a certified independent laboratory certifying the proposed playground surface system is fully compliant with ASTM 1292-04 up to 10’ fall height.

4. One (1) copy of independent test report from a certified independent laboratory certifying the proposed playground surface system is fully compliant with ASTM 1951 Standardized test for ADA Compliance.
5. One (1) of the product warranty for proposed synthetic grass product.
6. One (1) copy of their maintenance instructions. These instructions will include all necessary instructions for the proper care and maintenance of the newly installed synthetic grass system.
7. One (1) copy of edge details of proposed installation and terminations of synthetic grass system.
8. One (1) copy (if requested) of independent laboratory test reports on system or components.
9. One (1) copy of independent test report from a certified independent laboratory certifying the installed playground surface system is fully compliant with ASTM 1292-04 up to 10' fall height. This submittal shall be provided prior to substantial completion.

PART 2 - PRODUCTS

2.1 GENERAL

A. Equivalent Products – Requests for substitution of specific products shall conform strictly to Section 01 25 00 – Substitution & Product Option

2.2 SYNTHETIC GRASS SYSTEM

   - Pile Weight: 48 oz/sy
   - Face Yarn Type: Polyethylene XP slit film. Secondary: Heat set textured nylon monofilament
   - Yarn Count: Primary 8040/1; Secondary 4200/8
   - Blade height: 1-5/8 inch (finish height may be slightly lower)
   - Color: Primary: Field Green; Secondary: Grass green/tan blend
   - Construction: Broadloom tufted, Dual yarn, same row
   - Tufting Gauge: 3/8”
   - Primary Backing: 3-layer backing with geotex laminate
   - Total Product Weight: 113 oz s/y (+/- 2 oz)
   - Finished Roll Width: 15 feet (4.6 m)
   - Finished Roll Length: Up to 240 feet (73 m)
   - Infill: .75 pounds of rubber
   - Or approved equal.

1. The synthetic grass shall be delivered in 15’ foot wide rolls. The rolls will be laid out and installed as specified in the site layout and equipment placement drawings.
2. All seams shall be installed and secured with micromechanical bonding. Seams secured with adhesive or stitching alone shall not be acceptable.

B. Safety Foam Surface

1. Rated according to ASTM F1292-04 for a minimum height of 10 feet; all performance statements must be accompanied by independent test data from a nationally certified testing agency outlining all materials of system construction.

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2. Rated according to ASTM F 1951 Standardized Test for ADA Compliance

C. Synthetic Grass Infill Material
   1. Envirofill, USGreentech LLC, 1-888-320-8274, or approved equal.

D. Base Drainage Aggregate
   1. Base drainage aggregate shall be 5/8” minus crushed rock.

E. Bender Board
   1. Bend a Board by Epic Plastic, not less than ¾” x 2” or approved equal.

F. Subgrade Material
   1. Subgrade Material shall consist of granular and nongranular soil and/or aggregate that is free of deleterious material and does not contain wood, plastic, organic waste, clay, frozen lumps concrete, asphalt or any other deleterious, extraneous or objectionable material. Material shall have a maximum particle size of two inches. Material shall not contain more than 3 percent organic material by weight.

PART 3 - EXECUTION

3.1 GENERAL

A. Inspect prepared concrete curb and existing subgrade to ensure site is ready for synthetic grass construction. Check drainage of existing subgrade to ensure that it is free draining. Scarify existing subgrade to 8 inch depth as needed to allow drainage.

B. The synthetic grass installer shall strictly adhere to the installation procedures outlined under this section and by the Construction Documents. Any variance from these requirements must be accepted in writing, by the synthetic grass vendor, and submitted to the Owner or Owner’s Representative, verifying that the changes do not adversely affect the performance or warranty.

3.2 BASE AND DRAINAGE CONSTRUCTION:

A. Excavation and subgrade: Establish subgrade

B. Synthetic or plastic wood nailer board: The synthetic grass perimeter fastening structure shall be installed before the drainage aggregate.
   1. Install bender board. Bender board (“nailer board”) will be fastened to the adjacent concrete surfacing with ¼” x 1-1/2” Tapcon masonry screws. Nailer board shall be flush to grade or as specified in site detail drawings. See synthetic surfacing mound detail in Contract Documents.

C. Base Drainage Aggregate: Install free draining Base Drainage Aggregate following procedures that protect the base grade soils. Install per Contract Documents.
   1. The stone shall be left firm, but not over-compacted as to protect the porosity and drainage capabilities of the aggregate profile.
3.3 RESILIENT BASE INSTALLATION:

A. A free draining aggregate base of a minimum of 2” shall be installed then a 3.125 inch thick closed cell playground pad (ASTM 1292-04) is installed and leveled on the gravel base for an 11 foot fall system.

3.4 SYNTHETIC GRASS SYSTEM INSTALLATION

A. After a final inspection of the base drainage aggregate and closed cell playground pad by the synthetic grass contractor and the Owner’s Representative, the synthetic grass installation shall begin.

1. Synthetic grass rolls shall be joined via micro-mechanical bond seaming and reinforced with specialty grass adhesive where necessary.
2. Seams shall be flat, tight and permanent with no separation or fraying.
3. Seams shall be rolled with weighted roller to ensure adhesion.
4. Synthetic grass yarn fabric that is trapped or glued between seams shall be freed from the seams by hand or other approved method to an upright position prior to the commencement of brushing and top-dressing synthetic grass rolls by the manufacturer wherever possible.

B. Synthetic Grass Perimeter Attachment:

1. After final layout and seaming of the synthetic grass product, the synthetic grass material shall be wrapped over the edge of the curb nailer board and secured the full depth of the nailer board.
2. The grass shall be attached to the synthetic wood or plastic nailer board by stainless steel staples, screws, and/or nails, with minimum 7/16” x 1-1/4” stainless steel staples at 1” minimum on center.
3. Soil or surfacing material outside of the defined playground area shall be backfilled against grass wrapped perimeter edge and have zero transition edge to synthetic grass unless otherwise specified.

C. Infill Application: After all seaming is completed; the infill materials shall be applied evenly.

3.5 CLOSEOUT

A. The synthetic grass vendor must verify that a qualified representative has inspected the installation and that the finished playground surface conforms to the manufacturer’s requirements.

B. Extra materials: Owner shall be given option to retain and store excess materials such as excess grass and infill ordered for project, but not installed.

3.6 CLEAN UP

A. Contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surfaces and installed items.

B. During the contract and at intervals as directed by the Owner or Owner’s Representative and as synthetic grass system installation is completed, clear the site of all extraneous materials, rubbish, or debris and leave the site in a clean, safe, well-draining, neat condition.

C. Surfaces, recesses, enclosures, etc. shall be cleaned as necessary to leave the work area in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

END OF SECTION
SECTION 32 91 13

SOIL PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section includes furnishing labor, materials, equipment, and supplies and performing operations required and as defined herein and as shown on the Plans, including without limitation:

1. Coordination with tree, shrub, and ground cover planting and seeding, sod lawn and irrigation schedules.
2. Preparing subgrade soils;
3. Furnishing and tilling specified topsoil mix and soil amendments into prepared subgrade soils; and
4. Protection of completed soil preparation areas.

1.2 QUALITY ASSURANCE

A. Products supplied are to comply with applicable State and Local codes.

B. Contract the services of a qualified Agricultural Chemist, experienced in public or private soils testing and capable of providing specified soil tests required under this Section.

1.3 SUBMITTALS

A. Submit the following information in conformance with submittal procedures noted in Division 01.

1. Product data, including supplier name and phone number, and 1 gallon samples of specified Topsoil and Organic Soil Amendment.
2. Current (2 months prior to installation) test reports from an accredited soils testing laboratory for supplied Topsoil and Organic Soil Amendment describing composition and nutrient levels. Test reports to include recommendations, as necessary, for incorporation of additional soil amendments to achieve appropriate soil nutrient levels to sustain healthy plant growth.
3. Test reports for prepared site soils (topsoil and soil amendments placed and tilled into subgrade) from 4 locations selected by Owner’s Representative. The test reports are to include a recommended program of incorporation of additional amendments from the testing laboratory that will enable the prepared soil to provide soil nutrient levels that will sustain healthy plant growth.
4. Recommendations for amendments, if required, shall consist of slow release organic fertilizers to be incorporated into planting beds.
5. If additional amendments of the prepared soils are required, retest the prepared soils after they have been amended. Prepared soils are to be amended and retested at no additional expense to the Owner until such time as the test reports indicate that the prepared soils meet the criteria established by the testing laboratory for growth of healthy plantings.

6. Description of equipment, methods and procedures for tilling areas specified for soil preparation.

1.4 REVIEW BY OWNER’S REPRESENTATIVE

A. Owner’s Representative will review soil preparation for conformance with the requirements of this Section. Promptly correct areas of soil preparation that do not conform to the requirements of this Section at no additional expense to the Owner.

B. Owner’s Representative will review soil testing reports and soil preparation work specified in this Section prior to commencement of fine grading and planting operations. Secure Owner’s Representative’s written approval to commence the planting of trees, shrubs or ground covers or application of fine lawn seeding or sod lawn.

C. Provide Owner’s Representative with a minimum 3-working-day notice as to when subgrade and topsoil preparation will be ready for review by Owner’s Representative. Do not schedule review by Owner’s Representative until Contractor has confirmed that the relevant soil preparation (subgrade or topsoil) meets the requirements of this Section.

D. Failure to comply with the review and approval procedures described in this Section may require full re-preparation of subgrade and reincorporation of topsoil to specified depths.

PART 2 - PRODUCTS

2.1 ORGANIC SOIL AMENDMENT (COMPOST)

A. Organic Soil Amendment to consist of composted yard debris or organic waste material of 100% recycled content. In addition, it shall have the following characteristics:

1. Be screened to 7/16-inch.
2. Have a pH from 5.5 to 7.5.
3. Have a maximum electrical conductivity of 3.0 ohms/cm.
4. Have a maximum carbon to nitrogen ratio of 40:1.
5. Be certified by the Process to Further Reduce Pathogens (PFRP) guideline for hot composting as established by the United States Environmental Protection Agency.
6. Be fully composted, mature and stable before being acceptable.

B. Substitutions for the Organic Soil Amendment may be accepted. Provide complete chemical and physical laboratory analysis of proposed substitutes. Substitutes will be accepted at the discretion of Owner’s Representative upon proof of their equivalent or superior performance to Organic Soil Amendments.
PART 3 - EXECUTION

3.1 GENERAL

A. In general, proceed as rapidly as the site becomes available, consistent with normal seasonal limitations for soil preparation work.

B. Soil preparation within a tree’s Critical Root Zone (CRZ) must comply with the requirements of Specification 01 56 39 Tree Preservation, including without limitation, the requirement to obtain advance written approval of work within the (CRZ).

C. Remove debris, including without limitation, concrete spills or other spills and materials from other trades such as thinner, paint, plaster, concrete or other debris, prior to beginning Work under this Section. Notify Owner’s Representative immediately if contaminants are present.

D. Subgrade to consist of acceptable native soils that, when amended with specified Topsoil and Soil Amendments, will provide plants with nutrients, positive drainage and appropriate particle sizes that promote long-term plant health and stability. Immediately notify Owner’s Representative of poorly draining or unacceptable drainage conditions within landscape areas that will affect the health and maturation of new plantings.

E. Soil Moisture Content: Do not work soil when moisture content is so great that excessive compaction will occur, when it is so dry that dust will form in the air, or when clods will not break readily.

F. Keep streets, sidewalks and site clean and free from debris.

G. Keep affected drains open and free flowing at all times. Protect drains with filter fabric covers during construction and throughout plant establishment periods. Implement, maintain and keep functional the specified and required erosion control measures at all times.

H. Protect prepared soils from disruption by other Work and construction activities.

3.2 PRE-INSTALLATION CONFERENCE

A. At least 14 days prior to commencement of Work of this Section, schedule an onsite meeting with the Owner’s Representative, Contractor and Landscape Subcontractor to review the following:

1. Existing condition of subgrades to be tilled and receive topsoil. Subcontractor to accept, in writing, the condition of subgrades prior to subgrade preparation, topsoil placement, tilling and planting operations.
2. Planting schedule and potential conflicts with work by other trades.
3. Quality control and maintenance.
3.3 SUBGRADE ESTABLISHMENT AND PREPARATION

A. Inspect established subgrades to verify consistency with the Plans. If subgrades are different than shown on the Plans, notify the Owner’s Representative immediately.

B. Coordinate with other project work and the grading plans to achieve specified subgrade depths allowing for common fill (if any), specified amendments, Topsoil and Mulch as specified in this Section.

C. Prepare established subgrades as follows:
   1. Till areas to minus 4-inch depth and remove cobbles, rocks and debris, including any large organic debris and fill material such as glass, pipe or metal, over 2 inches in diameter.

D. Subgrade depths:
   1. New Planting Beds - Minus 7 inches from finish grade to allow for 4 inches of compost tilled into 8” of subgrade, 3 inches of mulch, and approximately 1-inch of settlement.
   2. Fine Lawn Areas – Minus 3 inches from finish grade to allow 4 inches of topsoil and approximately 1-inch of settlement

E. Secure approval of subgrade preparation by Owner’s Representative prior to implementation of soil preparation procedures.

3.4 SOIL PREPARATION

A. New Planting Beds:
   1. Prepare subgrade and till.
   2. Place compost in 1 lift of 4 inches each, tilling to a depth of 8” after the lift is placed.
   3. Bring planting bed grade to 2-inches below finish grade as shown on plans.
   4. Rake soil smooth to finish grades and remove cobbles, rocks and debris, including any fill material such as glass, pipe or metal, over 1-inch in diameter.
   5. Lightly compact with hand equipment and provide a consistent smooth planting bed. Heavily compact the 1-foot edge adjacent to pavement to minimize settlement.

B. Fine Lawn Areas:
   1. Prepare subgrade.
   2. Place 4” of compost in accordance with the soil amendment requirements of the King County Surface Water Design Manual and City of Kirkland Amendment.
   3. Rake soil smooth to finish grades and remove cobbles, rocks and debris, including any fill material such as glass, pipe or metal, over 1-inch in diameter.
   4. Lightly compact and immediately before seed installation lightly rake. Heavily compact the 1-foot edge adjacent to pavement to minimize settlement.

C. Erosion Control Lawn Areas:
1. Rake existing soil smooth to finish grades and remove cobbles, rocks and debris, including any fill material such as glass, pipe or metal, over 1-inch in diameter.
2. Lightly compact and immediately before seed installation lightly rake.

D. Finish Grading:

1. Fine grade beds to lines and grades shown on the Plans, provide tamped ‘V’ along the level of adjacent walks, pavements and 1/4-inch below curbs unless otherwise noted.
2. Fine finish Topsoil by raking smooth and even and removing extraneous matter. Work as necessary, until the surface is smooth, friable, and uniformly textured, ready for planting.
3. Install mulch as indicated on plans and specifications.

END OF SECTION
SECTION 32 92 19

SEEDING

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section includes furnishing labor, materials, equipment, and supplies and performing operations required and as defined herein and as shown on the Plans, including without limitation,

1. Seed bed preparation, application of hyrdoseeding, and protection of seeded areas designated on the Plans.
2. Sweeping paved surfaces and removing debris following seeding operations and prior to leaving site.
3. Maintenance of seeded areas until Substantial Completion.

1.2 QUALITY ASSURANCE

A. Seed that has become wet, moldy or otherwise damaged will not be accepted.

B. Seed to conform to the requirements of the Washington State seed law, and when applicable, the Federal Seed Act, "certified" grade or better.

1.3 SUBMITTALS

A. Submit the following information in conformance with submittal procedures noted in Division 01.

1. Seed vendor(s) names, addresses and phone numbers;
2. Certification from each seed vendor for required grass seed mixture, indicating percentage by weight and percentages of purity, germination, inert material and weed seed for each grass species.
3. Other Materials: Product literature, tear sheets and a complete list of product names and suppliers with addresses and contact information for materials proposed, including but not limited to fertilizer, wood fiber mulch, soil binding agent, and other miscellaneous materials, to be furnished and installed. Submittals are to demonstrate product conformance with the relevant requirements in this Section.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver seed and fertilizer materials in original unopened containers showing weight, analysis and name of Manufacturer. Store seed and fertilizer in such a manner that will prevent wetting and deterioration.
1.5 REVIEW BY OWNER’S REPRESENTATIVE

A. Prior to Hydroseeding: request review and approval of soil preparation, soil placement and fine grading of seeded lawn areas by the Owner’s Representative. Correct any soil preparation, soil placement or fine grading that does not conform to the requirements of this Section as determined by Owner’s Representative.

B. During the Maintenance Period: Owner’s Representative will periodically review seed germination, lawn establishment and lawn maintenance practices until Substantial Completion. Deficiencies will be noted and reported to the Contractor. Contractor is required to correct deficiencies, including reapplication of hydroseeded materials to the satisfaction of the Owner’s Representative within 2 weeks notice of deficiencies.

C. Provide Owner’s Representative with a minimum 3 working days notice to perform applicable reviews as described in this Section. Do not schedule review by Owner’s Representative until Contractor has confirmed that the relevant requirements of the Plans and this Section have been met. Do not implement hydroseeding operations prior to Owner’s Representative’s approval of soil preparation, soil placement or fine grading.

D. Failure to comply with the review and approval procedures described in this Section may require replacement and/or reinstallation of plant materials at no additional expense to the Owner.

PART 2 - PRODUCTS

2.1 HYDROSEEDING MATERIALS

A. Fine Lawn Seed Mix: Conform to the following:

1. 70% Turf type, Perennial Ryegrass
   a. Ryegrass shall be a blend of approximately equal fractions of three of the following: Fiesta 4, Exacta 2, Secretariat, or comparable perennial ryegrass.

2. 30% Kentucky Bluegrass.
   a. 100% Wildhorse Kentucky Bluegrass or comparable Ky. Bluegrass.

B. Steel Landscape Edging shall conform to the following:

1. Steel Landscape Edging shall be an all-steel interlocking system, 3/16” to 1/4” thick, and 4” to 6” min. depth, in 16’ to 20’ long sections with 6 steel stakes per section, having either an aluminum or a powder coated or exterior-grade black painted finish. Supply adequate stakes for each section to be installed. Stakes shall be 15” long steel construction. Steel Landscape Edging as manufactured by Sure-loc Edging Corporation, Holland, MI, Ph. 800 787-3562 or www.sureloceding.com, or Border Concepts, Charlotte, NC, Ph: 704 541-5509 or www.borderconcepts.com, Collier Metal Specialties, Inc., Dallas Texas, Ph: 1 800 829-8225 or www.colmet.com, or approved equal.
2.2 FERTILIZER
   A. A natural or bridge-type combination fertilizer (part natural, part synthetic slow release), 8-2-4.

2.3 WOOD FIBER MULCH
   A. 100-percent fiber, manufactured by the defibrating process, from Fir, Hemlock or Alder; containing no growth or germination inhibiting substances.
   B. Mulch to be uniform in weight and dyed a suitable color to facilitate visual measurement of placement.

2.4 SOIL BINDING AGENT
   A. A Soil Binding Agent is required. Soil binding agent shall consist of non-toxic, biodegradable materials that are environmentally safe such as MG 250F, Guar Gum Powder, or approved equal.

PART 3 - EXECUTION

3.1 GENERAL
   A. Seeding operations to occur between March 15th and October 15th. If Contractor's Owner-approved schedule and sequencing does not allow for seeding within seasonal requirements, provide and install sod lawn pursuant to an approved Change Order.
   B. Proceed as rapidly as the site becomes available, consistent with normal seasonal limitations for fine lawn hydroseeding.
   C. Install Steel Landscape Edging per manufacturer’s instructions.
   D. Remove debris from other trades prior to beginning Work.
   E. Review existing soil conditions for contaminants that may have been discarded by other trades, such as thinner, paint, plaster, concrete or debris and notify the Owner's Representative immediately if contaminants are present.
   F. Unless when otherwise approved in writing by Owner’s Representative, hydroseeding operations are not to be undertaken:
      1. During windy weather;
      2. When the ground is frozen; or
      3. When the temperature is below 40 degrees Fahrenheit.
3.2 SUBGRADE AND SOIL PREPARATION

A. Complete specified subgrade and soil preparation operations, compaction and clean up of debris prior to seeding. Secure Owner’s Representative’s review and approval prior to commencement of hydroseeding operations.

3.3 HYDROSEEDING

A. Coordinate scheduling of hydroseeding operations with Owner’s Representative. Provide Owner’s Representative with a minimum 3 working days notice of seeding operations.

B. Apply wood fiber mulch, seed, fertilizer and soil binding agent in one operation with approved hydraulic equipment. Apply materials at the following rates:

1. Wood Fiber Mulch – fifty pounds per 1,000 square feet.
2. Seed –7 pounds per 1,000 square feet.
3. Fertilizer –10 pounds per 1,000 square feet.
4. Soil-binding Agent –1 pound per 1,000 square feet.

C. Equipment to utilize water as carrying agent and a continuous built-in agitation system. Equipment with a gear pump is not acceptable.

D. Pump a continuous, non-fluctuating supply of homogenous slurry to provide a uniform distribution of material over designated areas.

E. Two-weeks after initial seeding apply seed, fertilizer and soil binding agent in one operation with approved hydraulic equipment. Apply materials at the following rate:

1. Seed –7 pounds per 1,000 square feet.
2. Fertilizer –10 pounds per 1,000 square feet.
3. Soil-binding Agent –1 pound per 1,000 square feet.

3.4 CLEANING

A. Immediately clean/wash off hydroseed slurry over-sprayed onto pavements, trees, monuments, site furnishings, and the like before it dries. Immediately remove hydroseed slurry over sprayed onto planting bed areas.

B. Perform daily sweeping and cleaning of adjacent pavements and landscape areas during installation of the Work and upon completion of the Work.

C. Remove from the site excess materials, soil, litter, debris and equipment.

D. Restore areas damaged due to hydroseeding operations per these Specifications.
3.5 MAINTENANCE

A. Ensure that seeded areas have germinated to provide a uniform dense cover with minimum 1.5 inches in height and in a healthy growing condition. Reseed bare spots and areas that have less than 75 percent coverage 30 days after hydroseeding.

B. Provide maintenance of seeded lawn areas until Substantial Completion by the Owner. Maintenance to include: watering, weed removal and control, applying organic fertilizing (if necessary), and re-seeding,

C. Correct defective work, as soon as possible, after deficiencies become apparent and weather and seasonal limitations permit. Water newly seeded lawn areas to keep seed moist without oversaturation. Adjust irrigation controller to provide establishment watering. Confirm coverage and adjust as needed.

D. Maintenance schedule: Lawns to be mowed twice monthly during the growing season, fertilized in the spring and fall and weeded monthly. Provide written notice of the timing of each weeding and mowing operation to the Owner’s Representative.

E. Owner’s Representative will periodically review lawn maintenance practices until Substantial Completion. Deficiencies will be noted and reported to the Contractor. Contractor is required to correct deficiencies to the satisfaction of the Owner’s Representative within 2 weeks notice of deficiencies.

3.6 ONE-YEAR WARRANTY

A. Warrant the Work of this Section for a period of 1 year from the date of Substantial Completion against defects of materials and workmanship (the Warranty Period).

B. One-Year Warranty Review: A final review may be held if requested by the Owner in presence of Contractor and Owner or Owner’s Representative at the end of the Warranty Period. The Owner will notify parties of the Warranty review a minimum of 14 days prior to the anticipated meeting date.

END OF SECTION
SECTION 32 93 00
LANDSCAPE PLANTING

PART 1 - GENERAL

1.1 DESCRIPTION:

A. Furnish all materials, equipment and labor necessary for planting trees, shrubs and ground covers as shown and specified. The work includes but is not limited to:

1. Soil Preparation and/or Installing Specified Planting Soils.
2. Procurement of Plant Materials and Installation.
3. Tree Staking
4. Mulch
5. Maintenance and Establishment Procedures.
6. Sweeping paved surfaces and removing debris prior to leaving the site.

1.2 REFERENCES:

A. All construction shall be in accordance with the City of Kirkland (COK) Standard Plans and/or Specifications (most recent editions).

1.3 QUALITY ASSURANCE:

C. All plants shall be nursery grown or collected materials that has been held in a nursery for at least one year. Nursery climatic conditions must be similar to those in the locality of the project. All plants shall be weed free at the time of planting.
D. Stock furnished shall be at least the minimum size indicated.
1.4 **SUBSTITUTIONS:**

A. Substitutions of plant materials will not be permitted unless authorized in advance in writing by the Consultant and Engineer. If proof is submitted that any plant specified is not obtainable due to lack of availability in the nursery trade, a proposal will be considered for use of the nearest equivalent size or variety with corresponding adjustment of Contract price and Engineer's approval. Such proof shall be substantiated and submitted in writing to the Engineer a minimum of forty-five (45) days prior to start of Work under this section. Contractor to provide a minimum of two (2) options for each substitution. Notwithstanding the foregoing, these provisions do not relieve the Contractor of the responsibility of obtaining specified plant materials in advance, even if special growing conditions or other arrangements must be made in order to supply specified materials.

1.5 **SUBMITTALS:**

A. Submit the following to the Engineer for approval a maximum of ten (10) days after Notice to Proceed:

1. Plant materials: A complete list of plant materials proposed to be furnished and installed, demonstrating conformance with the requirements in this Section. The list is to include:
   a. Names, addresses and phone numbers of nurseries and suppliers;
   b. Verification of plant quantities as shown on the plans;
   c. Proof of deposit or written assurance from each nursery that the plants have been secured and reserved for the project.

2. Other Materials: Product literature, tear sheets and a complete list of product names and suppliers with addresses and contact information for materials proposed, including but not limited to mulch, tree-staking materials, fertilizer certificates, and other miscellaneous materials, to be furnished and installed. Submittals are to demonstrate product conformance with the relevant requirements in this Section.

3. Source name and ½-pound samples of specified Mulch.

4. Landscape Contractor and Lead Foreman qualifications.

1.6 **REVIEW BY ENGINEER:**

A. Provide Engineer with a minimum five (5) working days’ notice as to when plant materials, or plant layout, as applicable, will be ready for review. Do not schedule review by Engineer until Contractor has confirmed that the relevant requirements of the Plans and this Section have been met. Do not install plant materials prior to Engineer’s approval of plant materials and proposed layouts.

B. Plant Materials:

1. At the Growing Site: Engineer may inspect and/or tag plant material scheduled for the Project at the growing site identified by the Contractor.

2. Upon Delivery: Engineer will review plant materials onsite upon delivery for conformance with the requirements of this Section, including plant specifications, storage and handling requirements. Immediately remove from the site plants which are not true to name or
which do not comply with the specified requirements. Replace rejected plant materials with conforming plant material.

3. During Construction: Engineer reserve the right to reject plant materials for nonconformance at any time from the delivery of such plant material to the site through the end of the warranty period.

C. Layout: Engineer will review the layout of trees and other plant materials. Failure to comply with the review and approval procedures described in this Section may require replacement and/or reinstallation of plant materials at no additional expense to the Owner.

1.7 DELIVERY, STORAGE AND HANDLING:

A. Dig, pack, transport, and handle plants with care to ensure protection against injury. Inspection certificates required by law shall accompany each shipment invoice or order to stock. On arrival, the certificate shall be filed with the Engineer. Protect all plants from desiccation. “Wiltproof” or another antidesicant shall be applied only with approval of the Engineer. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Engineer. Water heeled-in plantings daily. No plant shall be bound with rope or wire in a manner that could damage or break the branches.

B. Cover plants during transportation on open vehicles with a protective covering to prevent wind-burn. Plants arriving to the site uncovered will be rejected.

C. Provide dry, loose soils for planting. Frozen or muddy soil is not acceptable.

D. Nursery stock shall be handled by root ball only, not the trunks, stems or tops.

1.8 PROJECT CONDITIONS:

A. Work Notification: Notify the Engineer at least 5 working days prior to the installation of plant materials.

B. Protect existing utilities, paving, and other facilities from damage caused by planting operations.

C. Do not install plant material when ambient temperatures may drop below 35°F or above 80°F.

D. Do not install plants when wind velocity exceeds 30 MPH.

E. Confine work to designated areas. Do not disturb existing vegetation outside project limits and protect all trees, shrubs and ground covers within project limits not designated to be removed per Section 01 56 39 Temporary Tree, Vegetation & Soil Protection. Do not permit vehicular traffic or materials storage under or around new or existing trees.
PART 2 - PRODUCTS

2.1 PLANT MATERIALS:

A. Plants: Provide plants typical of their species or variety; with normal, densely developed branches and vigorous, fibrous root systems. Provide only sound, healthy, vigorous plants free from weeds, defects, disfiguring knots, sunscald injuries, and abrasions of the bark, plant diseases, insect eggs, borers, and all forms of infestation. All plants shall have a fully developed form without voids, open spaces, broken branches, flush cuts or stubs.

1. Dig balled and burlapped plants with firm, natural balls of earth of sufficient diameter and depth to encompass the fibrous and absorbing root system necessary for full recovery of the plant. Provide ball sizes complying with the latest edition of the "American Standard for Nursery Stock." Cracked or mushroomed balls are not acceptable.

2. Container-grown stock: Grown in a container for sufficient length of time for the root system to have developed to hold its soil together, firm and whole.
   a. No plants shall be loose in the container.
   b. Container stock shall not be pot bound.

3. No pruning wounds shall be present with a diameter of more than one (1) inch and such wounds must show vigorous callous on all edges. Trees shall not be pruned within six (6) months prior to delivery.

4. Tag native plantings by source.

2.2 SOILS:

A. Per Section 32 91 13 - Soil Preparation

2.3 ROOR BARRIER

A. Root barrier shall be per COS 9-14.17

2.4 MULCHES AND DRAIN ROCK:

A. Wood Mulches shall be according to the following:

1. Arborist Wood Chip Mulch shall be coarse ground wood chips (approximately 1/2" to 3" along the longest dimension) derived from the mechanical grinding or shredding of whole trees or portions of trees. It may contain wood, wood fiber, roots, bark, branches, and leaves, but may not contain visible amounts of soil or lumber. It shall be free of weeds and weed seeds, and manufactured inert material (plastic, concrete, ceramics, metal, etc.). Arborist wood chip mulch, when tested, shall meet the following loose volume gradation:
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2. Acceptable substitutes, subject to the engineer’s approval, include chipped or shredded woody material, meeting the above size and inert material requirements, derived from composting operation screening (“overs”).

PART 3 - EXECUTION

3.1 GENERAL

A. Schedule and attend a preconstruction meeting with the Kirkland Parks and Community Services Department. Notify Engineer of the meeting time and location a minimum of five (5) days prior to the meeting.

3.2 INSPECTIONS:

A. Finish grading shall be inspected and approved by the Engineer prior to any planting.

B. Plant material shall be inspected and approved by the Engineer at the nursery or site prior to installation. The Contractor shall remove all unsatisfactory material from the site immediately and his/her own expense.

3.3 PREPARATION

A. Contractor shall locate plants by staking with stakes and flags as indicated on the Drawings or as approved in the field. If obstructions are encountered that are not shown on the drawings, do not proceed until the Engineer has approved the locations or selected alternate plant locations.

3.4 INSTALLATION PROCEDURES:

A. Plants brought to the planting site shall be bare root, balled and burlapped, or in containers, depending on how specified in the planting schedule in the Contract for the particular type of planting Material. Plants shall not be planted during freezing weather or when the ground is frozen. Plants shall not be planted during excessively wet conditions. Plants shall not be placed on any day in which temperatures are forecast to exceed 80 degrees unless the
Engineer approves otherwise. Plants shall not be placed in areas that are below finished grade.

B. Plants shall be removed from containers in a manner that prevents damage to the root system. Containers may require vertical cuts down the full depth of the container to accommodate removal. All circling roots shall be loosened to ensure natural directional growth after planting.

C. Excavate circular plant pits with scarified vertical sides, except for plants specifically indicated to be planted in beds. Provide planting pits at least twice the diameter of the root system or container. Depth of pit shall accommodate the entire root system. Scarify the bottom and sides of the pit to a depth of four inches. If groundwater is encountered upon excavation of planting holes, the Contractor shall promptly notify the Engineer.

D. Place specified planting soil for use around the balls and roots of the plants.

E. Set plant material in the planting pit to proper grade and alignment. Set plants upright, plumb, and faced to give the best appearance or relationship to each other or adjacent structure. Set crown of plant material at/or one inch above the finish grade. No filling will be permitted around trunks or stems or above grafts on grafted trees. Backfill the planting pits with specified soil or amendment. Do not use frozen or muddy mixtures for backfilling. After balled and burlapped plants are set, water in soil mixture around bases of balls and fill all voids.

1. Completely remove all of the burlap. If burlap has been chemically treated (green color), remove from the planting pit.
2. Remove completely all plastic wrapping materials, twine, and wires, and wire baskets from root balls.

F. Mulch:

1. Mulch tree and shrub planting pits and shrub beds with required mulching material 3" deep (settled) immediately after planting or as indicated on Plan. Thoroughly water mulched areas. After watering, rake mulch to provide a uniform finished surface.
2. Mulch ground cover beds with at least 2" deep (settled) immediately after planting is completed.
3. At existing trees, verify that mulch is not thicker than three (3) inches deep and no closer than twelve (12) inches to the trunk of the tree.

G. Staking: Stake all deciduous and coniferous trees immediately after planting.

H. Pruning: Prune all trees only to remove broken or damaged branches, or for aesthetic purposes as directed by the Engineer. Branches shall be pruned at the branch collar. Neither stubs nor flush cuts will be acceptable.
3.5 **MAINTENANCE AND ESTABLISHMENT:**

A. Maintain plantings for a period of 30 days after substantial completion of planting operations.

B. Maintenance shall include watering a minimum of three times a week and regular (at least twice weekly) cultivating, weeding, pruning (only as directed), and application of appropriate insecticides and fungicides necessary to maintain plants free of insects and disease.

1. Re-set settled plants to proper grade and position. Restore planting saucer and adjacent material and remove dead material.
2. Straighten, repair and adjust guy wires and stakes as required.
3. Correct defective work, as soon as possible, after deficiencies become apparent and weather and season permit.
4. Water trees, plants, and ground cover beds within the first 24 hours of initial planting, and not less than twice per week (including rain) until Physical Completion.

3.6 **SUBSTANTIAL/PHYSICAL COMPLETION:**

A. Inspection to determine Substantial Completion of planted areas will be made by the Engineer, upon the Contractor's request. Provide notification at least 5 working days before requested inspection date.

1. Planted areas will be accepted provided all requirements, including the maintenance period have been complied with and plant materials are alive and in a healthy, vigorous condition.

B. Upon Physical Completion, the Owner shall assume all plant maintenance.

3.7 **CLEAN UP:**

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, soil, debris, and equipment. Repair damage resulting from planting operations.

3.8 **WARRANTY AND REPLACEMENT:**

A. Warranty plant material to remain alive and be in healthy, vigorous condition for a period of 1 year after the date of Substantial Completion. Inspection of plants will be made by the Engineer at the end of warranty.

B. Replace, in accordance with the drawings and specifications, all plants that are dead or, as determined by the Engineer, are in an unhealthy or unsightly condition, and have lost their natural shape due to dead branches, or other causes due to the Contractor's negligence. The cost of such replacement(s) is at the Contractor's expense. Warrant all replacement plants for 1 year after Physical Completion, unless otherwise specified.

C. Warranty shall not include damage or loss of trees, plants, or ground covers caused by fires, floods, freezing rains, lightning storms, or winds over 75 MPH, winter kill caused by extreme weather conditions.
cold and severe winter conditions not typical of planting area; acts of vandalism or negligence on the part of the Owner.

D. Remove and immediately replace all plants, as determined by the Engineer, to be unsatisfactory during the initial planting installation.

END OF SECTION
SECTION 33 10 00

WATER DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, but is not limited to the following:

1. Verification of location (depth and horizontal) of existing service stubs in advance
2. Water service lines (Domestic and Fire), valves and back flow devices.
3. Coordination and installation of new services with the Northshore Utility District.
4. Coordination of building plumbing connection point with Mechanical.
5. Construction records.

1.2 REFERENCES

A. Reference the following standards:
   AHJ Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited COK and the Northshore Utility District
   COK City of Kirkland Standard Plans
   NUD Northshore Utility District Standard Specifications and Details, February 2019
   UPC The Uniform Plumbing Code
   IAMPO The International Association of Plumbing and Mechanical Officials Standards
   AWWA American Water Works Association Standards
   WAC 296-155 Washington Administrative Code (WAC) 296-155, Safety Standards for Construction Work
   WSDOT Washington Department of Transportation 2018 Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction
1.3 REGULATORY REQUIREMENTS

A. Comply with all applicable Federal, State and Local codes and safety regulations. If there are any conflicts among referenced standards, the more stringent requirements shall govern.

1.4 PERMITS

A. Obtain all permits; pay permit, new water service, street use, and inspection fees; and schedule inspections by COK and NUD and other agencies as needed and at no additional cost to the Owner.

B. Notify the Owner immediately if underground utilities not shown on the Contract Documents are encountered.

1.5 SUBMITTALS

A. Submit the following information in conformance with submittal procedures noted in Division 01.

1. Product data sheets or shop drawings for all materials, such as pipe, gate valves and valve boxes, and vaults.
2. Record drawings.

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Pipe smaller than four inches in diameter shall be copper tubing Type K, ASTM B88, annealed. The tubing shall be coupled using flare-type compression fittings, conforming to the requirements of AWWA C800, minimum 150-psi working pressure.

B. Pipe shall be marked with the National Sanitation Foundation (NSF) seal and in accordance with ASTM and AWWA marking requirements, which include, but are not limited to, the manufacturer's name and class of pipe. Pipe shall bear no evidence of interior or exterior extrusion marks. Pipe walls shall be uniform, smooth, and glossy.

C. Conductive warning tape shall be as defined per Section 31 00 00 - Earthwork.

D. Water Service Sleeve shall be 4-inch smooth-walled high density polyethylene (HDPE) pipe.

E. Water Service Pipe within the sleeve shall be restrained joint.
2.2 WATER SERVICE

A. Water service pipe, fittings, including stops, clamps, valves and couplings, shall conform to the Northshore Utility District Standards.

B. Water meters and associated appurtenances shall conform to the Northshore Utility District Standards.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify trenches are ready to receive work, and are excavated to the dimensions and elevations indicated on the Contract Documents.

B. Beginning installation means acceptance of existing conditions.

C. Verify locations of existing utilities and at points of connections to existing systems.

3.2 INSTALLATION

A. Conform trench excavation, bedding, and backfill for water mains with Section 31 00 00 - Earthwork, unless otherwise specified.

   1. Provide a minimum of 24-inches of cover for all water and fire service lines.

B. Install pipe, fittings and appurtenances in accordance with applicable sections of the Northshore Utility District Standards. and in accordance with manufacturer's instructions. Pipe deflection at joints shall be no more than one half the manufacturer's allowable amount.

C. Install conductive warning tape in accordance with Section 31 00 00 - Earthwork.

D. Connect to building water system. Refer to Mechanical and Plumbing Specifications.

3.3 WATER SERVICE

A. Coordinate with City of Kirkland and Northshore Utility District.

3.4 TESTING AND DISINFECTION

A. Coordinate testing with City of Kirkland and Northshore Utility District.

END OF SECTION
SECTION 33 33 00

SANITARY SEWER SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, but is not limited to:
   Verification of location (invert elevation and horizontal location) of existing service stubs, utilities and points of connection in advance.

1. Sanitary sewer pipe, maintenance holes (MH), cleanouts and fittings.
2. Coordination of work with COK and the Northshore Utility District
3. Connections to existing public and private system.
4. Coordination of connection with building.
5. Construction records.

1.2 REFERENCES

A. Reference the following standards:
   AHJ  Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited COK and the Northshore Utility District
   COK  City of Kirkland Standard Plans
   NUD  Northshore Utility District Standard Specifications and Details
   UPC  Uniform Plumbing Code
   IAMPO International Association of Plumbing and Mechanical Officials Standards
   WSDOT Washington Department of Transportation 2018 Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction

1.3 SUBMITTALS

A. Submit the following information in accordance with submittal procedures noted in Division 01.

1. Product data sheets or shop drawings for materials such as pipes, maintenance holes, fittings and cleanouts.
2. Written documentation verifying current side sewer contractor registration with Northshore Utility District.
3. Record drawings.

1.4 REGULATORY REQUIREMENTS

A. Comply with all applicable Federal, State and Local Codes and safety regulations. If there are any conflicts among referenced standards, the more stringent requirements shall govern.

1.5 PERMITS

A. Obtain and pay for Side Sewer permit, Street Use permit, and other permits as required.
B. Pay permit fees, new service fees, and schedule inspections at no additional cost to the Owner.

1.6 QUALIFICATIONS

A. All side sewers and sanitary sewer shall be installed by a licensed Side Sewer Contractor registered with the Northshore Utility District.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) PIPE

A. PVC pipe shall be integral wall bell and spigot, rubber gasket joint conforming to COK and Northshore Utility District Engineering Specifications.

2.2 DUCTILE IRON (DI) PIPE

A. DI pipe shall be Class 52 concrete lined ductile iron pipe conforming to Northshore Utility District Engineering Specifications.

2.3 FITTINGS, COUPLINGS AND JOINTS

A. Fittings shall be the same material as the pipe.
B. Tees to existing pipe shall be connected by core drilling and flexible connections, where applicable.
C. Jointing new pipe to existing pipe for sanitary sewer mains shall be in accordance with Northshore Utility District Engineering Specifications
D. Pipe-to-pipe connections between pipes of differing material shall be in accordance with Northshore Utility District Engineering Specifications.

2.4 BEDDING AND BACKFILL MATERIAL

A. Bedding and backfill material shall be in accordance with Section 31 00 00 - Earthwork.

2.5 CLEANOUTS

A. Cleanouts shall be in accordance with Northshore Utility District Engineering Specifications and as shown on the Contract Documents.

2.6 MAINTENANCE HOLES (MH)

A. Sanitary sewer maintenance holes (also referred to as “manholes”) shall be in accordance with Northshore Utility District Engineering Specifications, unless noted otherwise on plans.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify a minimum of 72 hours in advance of installation the invert elevation and location of services stubs. Verify that trenches are ready to receive work, and are excavated to the dimensions and elevations indicated on the Contract Documents.

B. Beginning installation means acceptance of existing conditions.

C. Verify locations of existing utilities as noted in other Sections.

3.2 INSTALLATION

A. Excavate and prepare trench in accordance with Section 31 00 00 - Earthwork.

B. Install pipe to the alignment, elevation, grade and slope as shown on the Contract Documents.

C. Construct sanitary sewer public mains in conformance with Northshore Utility District Side Sewer Specifications

D. Construct side sewers in conformance with Northshore Utility District Side Sewer Specifications

E. Install conductive warning tape in accordance with Section 31 00 00 - Earthwork.
F. Install cleanouts in accordance with WSDOT Section 7-19

G. Install maintenance holes in accordance with Northshore Utility District Side Sewer Specifications

3.3 BEDDING AND BACKFILLING

A. Place bedding and backfill in conformance with Section 31 00 00 - Earthwork and the Contract Documents.

3.4 CLEANING AND TESTING

A. Clean and test sanitary sewers in conformance with Northshore Utility District.

1. The new side sewer shall pass all tests required by the Northshore Utility District.
2. Replace side sewers that do not pass tests as directed by the Owner’s Representative and at no additional cost to the Owner.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section includes, but is not limited to:

1. Catch basins, culverts, cleanouts, storm drain pipes, downspout connections, fittings, and other appurtenances/storm drainage systems as shown on the Plans.
2. Verification of location (invert elevation and horizontal location) of existing service stubs and points of connection in advance of improvement installation.
3. Connections to existing public and private system.
4. Coordination of connection with building footing drains; downspout collection, wall drains, and water vault drains.
5. Construction records.

1.2 REFERENCES

A. Reference the following standards:
   AHJ Public Authority Having Jurisdiction AHJ is an abbreviation for public Authorities Having Jurisdiction. For this project the AHJ includes permitting agencies including but not limited COK and the Northshore Utility District
   COK City of Kirkland Standard Plans
   WSDOT Washington Department of Transportation 2018 Standard Specifications and Standard Plans for Road, Bridge, and Municipal Construction

1.3 REGULATORY REQUIREMENTS

A. Comply with all applicable Federal, State and Local codes and safety requirements. If there are any conflicts among reference standards, the more stringent requirements shall govern.

1.4 PERMITS

A. Pay permit fees, new service fees and schedule inspections at no additional cost to Owner.
1.5 QUALIFICATIONS

A. All public storm drains and service drains shall be installed by a licensed contractor that is registered with the district. See http://www.nud.net/about-us/departments/engineering/side-sewer-permit-requirements for additional requirements of Contractors installing utilities within the Project Site.

1.6 SUBMITTALS

A. Submit the following in accordance with submittal procedures noted in Division 01.

1. Product data sheets and shop drawings for materials, such as pipe, catch basins, storm structures, maintenance holes, fittings and cleanouts.
2. Documentation verifying Contractor registration for utility installation.
3. Documentation of permits and fees paid for the Work described in this Section.

PART 2 - PRODUCTS

2.1 POLYVINYL CHLORIDE (PVC) DRAIN PIPE


2.2 DUCTILE IRON PIPE (DIP)


2.3 SLOTTED STORM DRAIN PIPE (SSD)

A. Slotted Storm Drain Pipe (SSD)

1. Perforated polyvinyl chloride sub-surface drain (SSD) pipe and fittings must be either ASTM D2241 SDR 21 (Class 200) or ASTM D1785 Schedule 40. ASTM D2241 pipe must have rubber gasket joints, and ASTM D1785 pipe must have solvent welded joints. The slotted perforations must be 0.0064” wide x 1.00” long and spaced 0.3 inch apart on center. The slotted perforations on the pipe must be oriented as specified in the Contract.
2. The storm drain pipe that connects SSD to maintenance holes and storm drain structures shall be the same as SSD except that the pipe shall have solid walls.

2.4 TRENCH DRAIN

A. 4-inch Polydrain Shallow Channel or approved equivalent
2.5 FITTINGS, COUPLINGS AND JOINTS

A. Fittings, tees and jointing shall conform to COK Storm Drain Design Criteria.
B. PVC Pipe shall have rubber gasket slide jointing.
C. Ductile Iron Pipe fittings shall be per WSDOT 9-05.13.

2.6 CONDUCTIVE WARNING TAPE

A. Conductive warning tape shall conform to Section 31 00 00 - Earthwork.

2.7 BEDDING AND BACKFILL MATERIAL

A. Bedding and backfill material shall be in accordance with Section 31 00 00 - Earthwork and as noted on the Plans.

2.8 CATCH BASINS

A. Catch basins shall be COK Type 1.

2.9 CLEANOUTS

A. Cleanouts shall be in accordance with COK Standard Plan D.05A and per project drawings.

2.10 FILTER FABRIC

A. Filter fabric for storm drain systems specified in the section shall be non-woven geotextile and conform to Mirafi 140N or approved equivalent product.

2.11 DOWNSPOUT CONNECTION

A. Per Plan.

1. Drain Rock: Per Section 31 00 00 - Earthwork
PART 3 - EXECUTION

3.1 EXAMINATION AND COORDINATION WITH OTHER WORK

A. Verify a minimum of 72 hours in advance of installation the invert elevation and location of services at crossings and points of connections.

B. Verify location of existing utilities in accordance in other Sections.

C. Prior to the construction, make proper provisions to avoid interferences with installation of other work and/or other Contractors. Make any changes caused by neglect to coordinate work as directed by the Owner’s Representative and at no additional cost to the Owner.

D. Compare Storm Drainage Drawings and Specifications with Drawings and Specifications of other trades and report any discrepancies between the documents to the Owner’s Representative prior to beginning work.

E. Verify installation conditions as satisfactory to receive work of this Section. Do not install until unsatisfactory conditions are corrected. Beginning work constitutes acceptance of conditions as satisfactory.

3.2 TRENCHING AND PIPE INSTALLATION

A. Install storm drain pipe in accordance with COK.

B. Pipe material shall be the same from storm drain structure to storm drain structure within a run.

C. Excavate trench and install pipe to alignments, elevations, grades and slopes indicated on the drawings.

D. Excavate and prepare trench in accordance with Section 31 00 00 - Earthwork.

E. Install pipe in conformance with COK.

F. Install conductive warning tape in accordance with Section 31 00 00 - Earthwork.

3.3 CATCH BASIN AND INLET INSTALLATION

A. Install catch basins in accordance with COK.

3.4 CLEANOUT INSTALLATION

A. Install cleanout in accordance with COK and as indicated on the drawings.
3.5 **TRENCH DRAIN INSTALLATION**
   A. Install trench drain in accordance with manufacturer’s instructions.
   B. Slope trench drain to point of connection to the storm drainage system.
   C. Locate manufacturer’s catch basin at point of connection.

3.6 **BEDDING AND BACKFILLING**
   A. Place bedding and backfill in conformance with Section 31 00 00 - Earthwork.

3.7 **CLEANING AND TESTING**
   A. Clean and test pipe in conformance with COK and Northshore Utility District.
      1. The new storm drain system shall be required to pass any tests required COK and Northshore Utility District
      2. Replace section that fails testing as directed by Owner’s Representative and at no additional cost to Owner.

3.8 **CLEANING AND TESTING**
   A. Remove debris and leave premises clean and free of residue in accordance with the requirements of this Project Manual.

**END OF SECTION**