SECTION 000103 - PROJECT DIRECTORY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification of project team members and their contact information.

1.02 OWNER:

A. Name: State of Idaho - Idaho Transportation Department.
   1. Address Line 1: 8150 W. Chinden Boulevard.
   2. City: Garden City.
   3. State: ID.

B. Primary Contact: All correspondence from the Contractor to the Architect will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Title: Construction Manager.

1.03 CONSULTANTS:

A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Company Name: CSHQA.
      a. Address Line 1: 200 Broad St.
      b. City: Boise.
      c. State: ID.
      e. Telephone: (208) 343-4635.
   2. Primary Contact:
      a. Title: Project Manager.
      b. Name: Loren Broyles.
      c. Email: loren.broyles@cshqa.com.

B. Mechanical Engineering Consultant - Plumbing:
   1. Company Name: CSHQA.
      a. Address Line 1: 200 Broad St.
      b. City: Boise.
      c. State: ID.
      e. Telephone: (208) 3443-4635.

C. Mechanical Engineering Consultant - HVAC:
   1. Company Name: CSHQA.
      a. Address Line 1: 200 Broad St.
      b. City: Boise.
      c. State: ID.
      e. Telephone: (208) 343-4635.

D. Electrical Engineering Consultant:
   1. Company Name: CSHQA.
      a. Address Line 1: 200 Broad St.
      b. City: Boise.
      c. State: ID.
      e. Telephone: (208) 343-4635.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION 000103
SECTIONS 000107
SEALS PAGE

ARCHITECT: Craig A. Slocum, AIA
CSHQA, Inc.
200 Broad Street
Boise, Idaho 83702
(208) 343-4635, phone
(208) 343-1858, fax
craig.slocum@cshqa.com
www.cshqa.com

PLUMBING ENGINEER: Russell C. Pratt, P.E.
CSHQA, Inc.
200 Broad Street
Boise, Idaho 83702
(208) 343-4635, phone
(208) 343-1858, fax
russell.pratt@cshqa.com
www.cshqa.com

MECHANICAL ENGINEER: Russell C. Pratt, P.E.
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(208) 343-4635, phone
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russell.pratt@cshqa.com
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ELECTRICAL ENGINEER:

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(208) 343-4635, phone
(208) 343-1858, fax
jason.brunson@cshqa.com
www.cshqa.com

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Invitation to Bid (ITB) FM32004

Materials Training Lab Renovation

IDAHO TRANSPORTATION DEPARTMENT

District 3
8150 Chinden Blvd
Boise, Idaho 83714

Date of Issuance: September 9, 2019
### Administrative Information

<table>
<thead>
<tr>
<th>ITB Title:</th>
<th>Materials Training Lab Renovation</th>
</tr>
</thead>
<tbody>
<tr>
<td>ITB Project Description:</td>
<td>Materials Training Lab Renovation</td>
</tr>
<tr>
<td>ITB Lead:</td>
<td>Ruth Munoz, Facilities Management Contracting Officer Idaho Transportation Department 3311 W State St Boise, Idaho 83703 E-mail: <a href="mailto:ruth.munoz@itd.idaho.gov">ruth.munoz@itd.idaho.gov</a> Phone: (208) 334-8606</td>
</tr>
<tr>
<td>Submit sealed bid:</td>
<td>Address for Couriers/Physical Address 3311 W. State St Boise, Idaho 83703 Mailing Address PO Box 7129 Boise, Idaho 83707</td>
</tr>
<tr>
<td>Pre-Bid Conference:</td>
<td>2:00 p.m. (MT) on September 23, 2019 Pre-Bid Conference Location: Idaho Transportation Department 8150 Chinden Blvd Boise, Idaho 83714</td>
</tr>
<tr>
<td>Deadline To Receive Questions:</td>
<td>4:00 p.m. (MT) on September 27, 2019</td>
</tr>
<tr>
<td>ITB Closing Date:</td>
<td>2:29:59 p.m. (MT) on September 30, 2019</td>
</tr>
<tr>
<td>ITB Opening Date:</td>
<td>2:40 p.m. (MT) on September 30, 2019</td>
</tr>
<tr>
<td>Initial Term of Contract and Renewals (service completion):</td>
<td>The service performed under the contract will begin upon ITD’s written notice to proceed must be completed within 90 days.</td>
</tr>
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DIVISION 1 - GENERAL REQUIREMENTS
LEGAL NOTICE - ADVERTISEMENT FOR BIDS

In accordance with Idaho Code 67-5711, The Idaho Transportation Department will accept sealed bids for **FM32004 AND Materials Training Lab Renovation**. Bids packets will be accepted at the Idaho Transportation Department at 3311 W State St, Boise, Idaho, 83703, until 2:29:59 p.m. (MT) on **September 30, 2019** according to the Bid Package Schedule deadline. The Invitation to Bid package can be found at the following address: [http://itd.idaho.gov](http://itd.idaho.gov) “Other Solicitations” tab. A public bid opening will be held at the Idaho Transportation Department following the closing time for receipt of bids. Bidders and other properly interested parties are invited to be present at bid opening.

A pre-bid site tour will be held on September 23, 2019 2:00 p.m. (MT) at 8150 Chinden Blvd. Attendance by bidders is **STRONGLY RECOMMENDED**. Failure to account for all subjects observed and discussed at the Pre-Bid Meeting will not be a cause for a change order.

Each bid must be accompanied by a bid bond with a surety company licensed to do business in Idaho or a certified or cashier’s check drawn on an Idaho bank in an amount not less than 5% of the total bid made payable to Idaho Transportation Department. The bidder, in the event of failure to sign the contract or furnish the necessary 100% performance bond and the necessary 100% payment bond, will forfeit this surety.

Bidders shall be properly registered in the State of Idaho, in accordance with the Department of Self Governing Agencies as a “Contractor” licensed in the State of Idaho, in accordance with provisions of an act known as “Public Works Contractor’s State License Law, Title 54, Chapter 19, Idaho Code Amended”. Bidders shall be registered with the Idaho Secretary of State’s office to do business in the State of Idaho.

Before any contract is awarded for the work contemplated herein, Idaho Transportation Department shall conduct such investigation, as it deems necessary to determine the performance record and ability of the apparent low bidder to perform the type and size of project specified under this contract. Upon request, the bidder shall submit such information as deemed necessary for such evaluation.
INSTRUCTIONS TO BIDDERS

GENERAL PROVISIONS

DEFINITIONS: Capitalized terms used in these Instructions to Bidders (“Instructions”) shall have the meaning given to them in the Division of Public Works’ Fixed Price Construction Contract Between Owner and Contractor.

HEADINGS: Headings used in these Instructions are for convenience only.

REJECTION OF BIDS, WAIVER OF INFORMALITIES OR CANCELLATION: Prior to the effective date of a contract, the Administrator of the Division of Public Works shall have the right to accept or reject all bids, to waive any minor deviations/informalities or to cancel the bid.

ORAL INFORMATION: Questions concerning a bid must be directed in writing to the designated Design Professional (architect or engineer) no less than ten (10) calendar days before bids are due unless provided otherwise via an addendum. Oral information is not binding and any reliance by a bidder on any oral information or representation is at the bidder’s sole risk. Any information given a prospective bidder in response to a written question will be provided to all prospective bidders by an addendum, if such information is necessary for purposes of submitting a bid or if failure to give such information would be prejudicial to uninformed bidders.

PUBLIC RECORDS: The Idaho Public Records Law, Title 74, Chapter 1, Idaho Code, allows the open inspection and copying of public records. Public records include any writing containing information relating to the conduct or administration of the public’s business prepared, owned, used or retained by a State or local agency regardless of the physical form or character. Unless exempted by the Public Records Law, your bid will be a public record subject to disclosure under the Public Records Law. Any questions regarding the applicability of the Public Records Law should be addressed to your legal counsel prior to submission.

FORM OF AGREEMENT: Unless otherwise specified in the bid documents, the agreement between the successful bidder and the Owner (“State of Idaho”) shall be the Division of Public Works’ Fixed Price Construction Contract Between Owner and Contractor.

PERFORMANCE AND PAYMENT BONDS: A performance bond and payment bond are required for this Project, each in an amount of not less than one hundred percent (100%) of the Contract Price. The performance and payment bonds shall be AIA Document A312, 1984 or the most recent Edition, or a standard surety form certified approved to be the same as the AIA A312 form and shall be executed by a surety or sureties reasonably acceptable to the Owner and authorized to do business in the State of Idaho. Bonds must be provided within ten (10) calendar days following receipt of a Notice of Intent to Award.

BID SUBMISSION PROCESS

BID DOCUMENTS: The bid documents are available from the Design Professional or as provided in the Invitation to Bid or advertisement for bids. The responsibility is on the bidder to use a complete set of bid documents to prepare its bid and neither the Owner nor the Design Professional shall incur any liability for the bidder’s failure to do so. Bidders obtain no ownership interest or any use rights, except to use in preparation of their bid, by issuance of the bid documents.
Bidders and Sub-bidders shall field verify all dimensions pertaining to the Work and shall be responsible for the determination of all quantities of materials required for the completion of the Work. The bidder shall not rely on the scale drawings of the Bidding Documents in his determination of required materials quantities. No allowance shall be made for Bidder’s failure to field-verify dimensions.

If a deposit is required, the deposit will be returned to a bidder returning the complete bid documents in good condition no more than twenty (20) days after a Notice of Intent is issued and the amount of any deposit returned may be reduced if the bid documents returned are not complete or are damaged. A bidder awarded a Contract may also keep the bid documents and any deposit will be returned.

**ADDENDA:** In the event it becomes necessary to revise any part of the bid documents, addenda will be issued. Information given to one bidder will be available to all other bidders if such information is necessary for purposes of submitting a bid or if failure to give such information would be prejudicial to uninformed bidders. It is the bidder’s responsibility to check for addenda prior to submitting a bid. A bidder is required to acknowledge receipt of all addenda by identifying the addenda numbers in the space provided on the bid proposal form. Failure to do so may result in the bid being declared non-responsive. No addenda will be issued less than four (4) calendar days before the closing date unless the bid closing date is extended.

**REVIEW:** It is the bidder’s responsibility to review the bid documents and compare them as needed, including with regard to any other work that is or may be under construction that might affect the bidder or its work, to examine the site and local conditions and to report, in writing, any questions, errors, inconsistencies or ambiguities to the Design Professional.

**BID FORM:** Bids must be submitted on the bid proposal forms, or copies of forms, furnished by the Owner or the design professional. Bids submitted must contain all original signatures in ink on the following forms:

- Bid Proposal Form
- Contractor’s Affidavit Concerning Alcohol and Drug-Free Workplace
- Bidder’s Acknowledgment Statement
- Bid Bond (bid security)

The person signing the Bid Proposal Form must initial any and all changes appearing on any of the bid forms. If the bidder is a corporation or other legal entity, the bid forms must be signed by an authorized designee. Oral, telephonic, telegraphic, facsimile or other electronically transmitted bid forms and/or signatures will not be considered.

**BID PRICES:** The bid form may require bidders to submit bid prices for one (1) or more items on various bases, including lump sum base bid, lump sum bid alternate prices, unit prices or any combination thereof. Bid amounts shall be expressed in words and numbers. The amount in words shall prevail if there is a discrepancy.

**ALTERNATES:** If the solicitation includes alternate bid items or unit prices, failure to bid on the alternates or unit prices may disqualify the bid. If bidding on an alternate does not change the base bid, indicate by “No Change.” If bidding on all items is not required by the Contract Documents, bidders must affirmatively indicate that they are not bidding on those items.
TIME FOR SUBMISSION: Bids must be submitted on or before the time specified in the advertisement for bids. Any bid submitted late will be rejected.

SEALED ENVELOPE: Bids shall be submitted in a sealed envelope with the following clearly printed on the outside of the envelope: the Project number and Project name; the name and address of the bidder; and a statement, such as “BID ENCLOSED” to indicate that it is a bid.

MAILED BIDS: When bids are mailed or shipped, the sealed envelope containing the bid shall be enclosed in a separate mailing envelope with the notation “SEALED BID ENCLOSED” on the face thereof. If mailed, the mailing envelope shall be addressed as follows:

Idaho Transportation Department
Ruth Munoz/BSM
3311 W State St
Boise, Idaho, 83703

It is the bidder’s responsibility to ensure that its bid is delivered to the place designated for receipt on or before the specified closing time. The Owner assumes no responsibility for delays in the delivery of mail by the U.S. Post Office or private couriers. Bidders should be advised the intra-state mail system may increase delivery time from arrival at Central Postal to the place designated for receipt and should plan accordingly. LATE SUBMISSIONS WILL BE REJECTED, WILL NOT BE OPENED AND WILL BE RETURNED TO THE BIDDER. NO DEVIATIONS WILL BE ALLOWED.

BID CLOSING DECLARED: Immediately prior to the bid opening, the Owner’s representative will declare the official bid closing. Any part of a bid not received prior to the bid closing declared by the designated representative will not be considered and will be returned to the bidder unopened. All bids shall be taken under advisement.

DRUG-FREE WORKPLACE: Along with its bid, the bidder shall submit an affidavit certifying compliance with Title 72, Chapter 17, Idaho Code, requiring the Contractor and its subcontractors at the time of bid to provide a drug-free workplace program and to maintain such program throughout the duration of the Contract. The form of affidavit is attached.

ILLEGAL ALIENS: Bidder shall warrant that the bidder does not knowingly hire or engage any illegal aliens or persons not authorized to work in the United States; bidder shall take steps to verify that it does not hire or engage any illegal aliens or persons not authorized to work in the United States; and that any misrepresentation in this regard or any employment of persons not authorized to work in the United States constitutes a material breach and shall be cause for the imposition of monetary penalties and/or termination of any Contract resulting from this bid.

LEGAL RESIDENCY REQUIREMENT: By submitting a bid, the bidder attests, under penalty of perjury, that he (the bidder) is a United States citizen or legal permanent resident or that it is otherwise lawfully present in the United States pursuant to federal law. Prior to being issued a contract, the bidder will be required to submit proof of lawful presence in the United States in accordance with §67-7903, Idaho Code.

BIDDER’S ACKNOWLEDGEMENT STATEMENT: The attached Bidder’s Acknowledgement Statement must be completed and included or the bid may be found non-responsive.
PUBLIC WORKS CONTRACTOR’S LICENSE: This Project is not financed in whole or in part by federal funds. Bids will be accepted from those Contractors only (prime contractors, subcontractors and/or specialty contractors) who, prior to the bid opening, hold current licenses as public works contractors in the State of Idaho.

IDAHO PREFERENCE LAW: Section 67-2348, Idaho Code, requires the Division of Public Works to apply a preference in determining which Contractor submitted the lowest responsible bid. If the Contractor who submitted the lowest dollar bid is domiciled in a state with a preference law that penalizes Idaho domiciled contractors, the Division of Public Works must apply the preference law (percentage amount) of that domiciliary state to that Contractor’s bid.

NAMING OF SUBCONTRACTORS: Section 67-2310, Idaho Code, requires general (prime) Contractors to include in their bid the name of the subcontractors who shall, in the event the Contractor secures the Contract, subcontract the plumbing, HVAC, and electrical work under the general (prime) Contract. Failure to name subcontractors as required by this section shall render any bid submitted by a general (prime) Contractor nonresponsive and void. Subcontractors named in accordance with the provisions of this section must possess an appropriate license or certificate of competency issued by the State of Idaho covering the Contractor work classification in which the subcontractor is named.

The Division of Public Works interprets Section 67-2310, Idaho Code, to mean three (3) separate areas of work: plumbing work, HVAC, and electrical work. The Division of Public Works also requires that the general (prime) Contractor name the entity that will perform the Work, including if the entity is a subcontractor, a sub-subcontractor or the general (prime) Contractor submitting the bid. Failure to complete the Bid Proposal in full shall render a bid nonresponsive and void.

With regard to possessing an appropriate license or certificate of competency, all subcontractors listed by the general (prime) Contractor must have at the time of the bid opening a current license in the appropriate category (class, type and specialty category) as issued by the Public Works Contractors State License Board. In addition, plumbing, HVAC and electrical subcontractors shall have at the time of the bid opening a valid plumbing contractor’s license, HVAC contractor’s license or electrical contractor’s license, respectively, as issued by the Idaho Division of Building Safety.

In determining if the above listed subcontractors are required on the Project, the Division of Public Works will refer to the plans and specifications. If doubt exists prior to bid closing, potential bidders should contact the Division of Public Works and the Design Professional who prepared the plans and specifications will be requested to make the determination. If plumbing, HVAC or electrical work are not shown on the plans and specifications, but are discovered by the bidder prior to the date of bid opening, then the bidder must request clarification from the Design Professional. Absent such clarification, Work will be considered incidental and naming of a subcontractor will not be required.

BID SECURITY

AMOUNT AND FORM OF SECURITY: To be considered, bids must be accompanied by an acceptable bid security in an amount not less than five percent (5%) of the total amount of the bid, including additive alternates. The security may be in the form of a bond or a certified or cashier’s check. A standard surety bond form meeting all the conditions of AIA Document A310 is acceptable and, if used, must include a certified and current copy of the power of attorney if the bond is executed by the attorney-in-fact on behalf of the surety.
FORFEITURE: A successful bidder who fails to sign the Contract for the Work or furnish the required bonds within ten (10) calendar days following the receipt of notice of intent to award a Contract is subject to forfeiture in accordance with Section 54-1904E, Idaho Code.

RETENTION OF SECURITY: Bid security shall be retained for no more than forty-five (45) calendar days after the opening of bids, so long as the bidder has not been notified of the acceptance of the bid.

BID WITHDRAWAL

PRIOR TO BID CLOSING: If a bid has been submitted, it may be withdrawn in person by a bidder’s authorized representative before the opening of the bids. A bidder’s representative will be required to show identification and sign on a bid summary sheet before it will be released. After bid closing, no bid may be withdrawn except in strict accordance with these Instructions or applicable law.

BID MODIFICATION

PRIOR TO BID CLOSING: If a bid has been submitted, it may be modified by the submission of a written document contained in a separate sealed envelope marked “Bid Modification from [Name of Bidder] for ITD Project No: FM32004; Material Training Lab Renovation.” THE DOCUMENT MODIFYING THE BID MUST BE SIGNED IN INK BY AN AUTHORIZED REPRESENTATIVE OF THE SUBMITTING BIDDER. THE DIVISION OF PUBLIC WORKS RESERVES THE RIGHT TO REQUIRE PRESENTATION OF EVIDENCE SATISFACTORY TO IT TO ESTABLISH THE AUTHORITY TO ACT ON BEHALF OF THE SUBMITTING BIDDER. NO OTHER FORM OF MODIFICATION (INCLUDING TELEPHONE, FACSIMILE OR ELECTRONIC MAIL) WILL BE ACCEPTED. AFTER BID CLOSING, NO BID MAY BE MODIFIED EXCEPT IN STRICT ACCORDANCE WITH THESE INSTRUCTIONS OR APPLICABLE LAW.

RELIEF FROM BIDS

CONDITIONS FOR RELIEF: Relief from bids is subject to Sections 54-1904B through 54-1904E, Idaho Code. In the event a bidder discovers a mistake in its bid following the bid opening and wishes to withdraw its bid, the bidder shall establish to the satisfaction of the Owner, pursuant to Section 54-1904C, Idaho Code, that a clerical or mathematical mistake was made; the bidder gave the public entity (Owner) written notice within five (5) calendar days after the opening of the bid of the mistake, specifying in the notice in detail how the mistake occurred; and the mistake was material.

DETERMINATION: If the Owner determines that the bidder has satisfied the requirements of Section 54-1904C, Idaho Code, to entitle it to relief from a bid because of a mistake, it shall prepare a report in writing to document the facts establishing the existence of each required element. The report shall be available for inspection as a public record and shall be filed with the public entity soliciting bids. A bidder claiming a mistake and satisfying all the required conditions of Section 54-1904C, Idaho Code, shall be entitled to relief from the bid and have any bid security returned by the Owner. Bidders not satisfying the conditions of Section 54-1904C, Idaho Code shall be subject to forfeiture in accordance with Section 54-1904B, Idaho Code. A bidder who claims a mistake or who forfeits its bid security shall be prohibited from participating in any re-bidding of that project on which the mistake was claimed or security forfeited and the Owner may award the Contract to the next lowest responsive and responsible bidder.
BIDDER’S REPRESENTATIONS

REPRESENTATIONS UPON SUBMITTING A BID: By submitting its bid, a bidder represents and warrants the following:

1. The person signing the bid is authorized to bind the bidder;
2. It has all required licenses, permits or other authorizations necessary to submit its bid;
3. It has taken steps necessary to ascertain the nature and location of the Work and has investigated and satisfied itself as to the general and local conditions which can affect the Work or its cost, including but not limited to: (i) conditions bearing upon transportation, disposal, handling and storage of materials; (ii) the availability of labor, water, natural gas, electric power and roads; (iii) uncertainties of weather, river stages or similar physical conditions at the site; (iv) the conformation and conditions of the ground; and (v) the character of equipment and facilities needed preliminary to and during the Work;
4. It has satisfied itself as to character, quality and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is reasonably ascertainable from an inspection of the site, including exploratory work done by the Owner as well as from the drawings and specifications provided as part of the bid package, and that any failure of the bidder to take such actions will not relieve the bidder from responsibility for estimating properly the difficulty and cost of successfully performing the Work;
5. It has received, read and reviewed the Contract, has submitted any questions in writing regarding the same and has received an answer to such questions;
6. Its bid is based upon the requirements of the Contract without exception;
7. It is in compliance with Title 72, Chapter 17, Idaho Code, regarding a drug-free workplace and has included the required affidavit regarding the same;
8. Its bid is in compliance with employment of persons authorized to work in the United States;
9. It will retain bid security and hold and honor all base bid prices for forty-five (45) calendar days from the date of bid opening, and cannot be withdrawn after the bid opening;
10. Its bid prices shown for each item on the bid proposal form include all labor, material, equipment, overhead and compensation to complete all of the Work for that item; and
11. It has included in its bid amount Idaho sales and/or use taxes on all materials and equipment and all other taxes imposed by law.

BID AWARD

AWARD METHOD: Public works construction contracts for the State of Idaho are awarded to the "lowest responsible and responsive bidder." The low bidder, for purposes of award, shall be the responsible and responsive bidder offering the low aggregate amount for the base bid item, plus any additive or deductive bid alternates selected by the Owner, and within funds available as determined by the Owner. Award is also subject to the requirements of Idaho Code, including without limitation: Title 67, Chapter 57; Title 67, Chapter 23; Title 54, Chapter 19; and Title 44, Chapter 10. It is the bidder’s responsibility to conform to ALL applicable federal, state and local statutes or other applicable legal requirements. The information provided herein is intended to assist bidders in meeting applicable requirements but is not exhaustive and the Owner will not be responsible for any failure by any bidder to meet applicable requirements.

DETERMINATION OF RESPONSIBILITY: The Owner reserves the right to make reasonable inquiry about or from the submitting bidder or from third parties to determine the responsibility of a submitting bidder. Such inquiry may include, but not be limited to, inquiry regarding experience and expertise.
related to the Project, manpower and other resources, financial stability, credit ratings, references, potential subcontractors and past performance. The unreasonable failure of a submitting bidder to promptly supply any requested information may result in a finding of non-responsibility.

NOTICE OF EFFECTIVENESS: No Contract is effective until the authorized Owner’s official has signed the Contract and the Notice to Proceed has been issued. The bidder shall not provide any goods or render services until the Contract has been signed by the Administrator of the Division of Public Works and the Contract has become effective. Furthermore, the Owner is in no way responsible for reimbursing the bidder for goods provided or services rendered prior to the signature of the authorized Division of Public Work’s official and the arrival of the Notice to Proceed.

INCURRING COSTS: The Owner is not liable for any cost incurred by bidders prior to the Notice to Proceed.

PRIOR ACCEPTANCE OF DEFECTIVE BIDS OR PROPOSALS: The Owner generally will not completely review or analyze bids that appear to fail to comply with the requirements of the bid documents, nor will the Owner generally investigate the references or qualifications of those who submit such bids. Therefore, any acknowledgment that the selection is complete shall not operate as a representation by the Owner that an unsuccessful bid was responsive, complete, sufficient or lawful in any respect.

POST-AWARD SUBMITTALS: Upon receipt of a Notice of Intent to Award, the apparent low responsive and responsible bidder shall provide documentation required in such Notice. Such Notice of Intent to Award shall generally require the bidder to return to the Owner, within ten (10) days of receipt, a signed Contract, all required bonds, proof of insurance and documentation required by the Idaho State Tax Commission (report and affidavit).

OWNER’S RIGHT TO REJECT: Prior to execution of the Contract, the Owner or Design Professional shall provide written notice of any reasonable objection to any person or entity proposed by the bidder. Upon receipt of such notice, the bidder may withdraw its bid, without forfeiture, or propose a substitute and identify any change in any bid amount caused by such substitution. The Owner may accept or reject the substitution or the adjusted price. If the Owner rejects the substitution or the adjusted price, it will return the bidder’s bid guarantee.

END OF INSTRUCTION
BID PROPOSAL

TO: STATE OF IDAHO
    IDAHO TRANSPORTATION DEPARTMENT

Gentlemen:

The Bidder, in compliance with your Invitation for Bids for the construction of FM32004 Material Training Lab Renovation, having examined the bidding and Contract Documents and the site of the proposed Work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to furnish all labor, materials and supplies and to provide the service and insurance in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents.

Bidder hereby agrees to commence Work under this Contract on a date to be specified in the written "Notice to Proceed" of the Owner and to substantially complete the Project within 90 consecutive calendar days thereafter, as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of $500.00 for each consecutive calendar day after the established substantial completion date or adjusted date as established by change order.

Bidder acknowledges receipt of Addenda No. __________________. (List all Addenda)

BASE PROPOSAL: Bidder agrees to perform all of the base proposal Work described in the specifications and shown on the plans for the sum of:

___________________________________________________________ Dollars ($____________)

(Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.)

Alternate No. 1: _________________________________
Add the sum of _________________________________________________ Dollars ($____________)

Alternate No. 2: _________________________________
Add the sum of _________________________________________________ Dollars ($____________)

Alternate No. 3: _________________________________
Add the sum of _________________________________________________ Dollars ($____________)

Alternate No. 4: _________________________________
Add the sum of _________________________________________________ Dollars ($____________)
Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informality in the bidding.

The bidder agrees that this bid shall be good for a period of forty-five (45) calendar days after the scheduled opening time for receiving bids.

Upon receipt of written Notice of Intent to Award of this bid, Bidder will execute the formal Contract within ten (10) calendar days and deliver a Surety Bond or Bonds as required by paragraph “Performance and Payment Bonds” first page (ITB-1) of the Instructions to Bidders.

The bid security in the amount of five percent (5%) of the bid amount is to become the property of the Owner, in the event the Contract and bond are not executed within the time set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

The names and addresses of the entities who will perform the Work identified below, subject to approval of Owner and Architect, if Undersigned is awarded the Contract, are as follows:

**Plumbing (PWCL Category 15400)**
(Name) 
(Address)
Idaho Public Works Contractors License No. 
Idaho Plumbing Contractors License No. 

**Heating, Ventilating & Air Conditioning (PWCL Category 15700-HVAC)**
(Name) 
(Address)
Idaho Public Works Contractors License No. 
Idaho HVAC Contractors License No. 

**Electrical (PWCL Category 16000)**
(Name) 
(Address)
Idaho Public Works Contractors License No. 
Idaho Electrical Contractors License No. 

**FAILURE TO NAME A PROPERLY LICENSED SUBCONTRACTOR IN EACH OF THE ABOVE CATEGORIES WILL RENDER THE BID UNRESPONSIVE AND VOID.**
Should the listing of subcontractors change due to selection of alternates or other similar circumstances, attach explanation.

Bidder warrants that bid has been prepared and that any contract resulting from acceptance of this bid is subject to the Fixed Price Construction Contract.

The undersigned notifies that it is of this date duly licensed as an Idaho Public Works Contractor and further that it possesses Idaho Public Works Contractor’s License No. __________________________, or that it and its subcontractors shall have secured a Public Works Contractor’s License at or prior to award and execution of the Contract for construction and is domiciled in the State of __________________________.

Dated this ________ day of __________________, ________.

(date) (month) (year)

Respectfully submitted by:

______________________________
(Contractor’s Name - Typed)

______________________________
(Street or PO Address)

______________________________
(City, State and zip code)

______________________________
(Authorized Signature)

______________________________
(Title)

______________________________
(Telephone Number)

______________________________
(FAX Number)

______________________________
(Email Address)

Have you remembered to include bid security (bid bond or a certified or cashier’s check), Contractor’s Affidavit Concerning Alcohol and Drug-Free Workplace and a signed copy of the Bidder’s Acknowledgment Statement with your bid?
CONTRACTOR’S AFFIDAVIT
CONCERNING ALCOHOL AND DRUG-FREE WORKPLACE

STATE OF ________________________

COUNTY OF ______________________

Pursuant to the Section 72-1717, Idaho Code, I, the undersigned, being duly sworn, depose and certify that _________________________________ is in compliance with the provisions of Section 72-1717, Idaho Code; that _________________________________ provides a drug-free workplace program that complies with the provisions of Title 72, Chapter 17, Idaho Code, and will maintain such program throughout the life of a state construction contract; and that _________________________________ shall subcontract Work only to subcontractors meeting the requirements of Section 72-1717(1)(a), Idaho Code.

Name of Contractor

________________________________________
Address

________________________________________
City and State

By: ________________________________
   (Signature)

Subscribed and sworn to before me this ________________ day of ________________, ______.

________________________________________
NOTARY PUBLIC
Residing at: ________________________________
Commission expires: ________________________________

FAILURE TO EXECUTE THIS AFFIDAVIT AND SUBMIT IT ALONG WITH YOUR BID SHALL MAKE YOUR BID NON-RESPONSIVE.
BIDDER’S ACKNOWLEDGMENT STATEMENT

NOTE: THE INFORMATION CONTAINED HEREIN IS A SUMMARY OF VITAL CONTRACT PROVISIONS AND DOES NOT CHANGE THE CONTRACT DOCUMENTS THAT WILL GOVERN THIS PROJECT.

Project number. FM32004, Materials Training Lab Renovation

By submitting a bid for this Project, the undersigned bidder agrees that, if awarded the Contract for construction, Contractor will conform to all conditions and requirements of the Contract, including but not limited to:

- Contractor agrees to comply with conditions pertaining to Sections 44-1001 and 44-1002, Idaho Code, requiring the employment of ninety-five percent (95%) bona fide Idaho residents and providing for a preference in the employment of bona fide Idaho residents and regarding the employment of persons not authorized to work in the United States.

- Contractor will substantially complete the Work within the time stated in the Contract Documents, or as modified by Change Order(s).

- If the Contractor fails to substantially complete the Project within the time stated in the Contract Documents, or as modified by Change Order, the Contractor agrees that the Owner may deduct from the Contract amount liquidated damages in the amount per calendar day, indicated in the Contract Documents, times the number of calendar days until the Project is Substantially Complete, as defined in the Contract Documents and as determined by the Design Professional.

- The Contractor agrees that the amount allowed for overhead and profit on any Change Order is limited to the amounts indicated in subparagraph 16.3.11 of the Fixed Price Construction Contract Between Owner and Contractor.

  1. For total changes the amount allowed for overhead, profit, bonds and insurance for the Contractor and all subcontractors of any tier combined shall not exceed fifteen percent (15%) of direct costs; or
  2. The Contractor will determine the amount of overhead and profit to be apportioned between the Contractor and its subcontractor of allowable amounts of overhead, profit, bonds and insurance.

- The Contractor agrees that Change Orders are governed by the Fixed Price Construction Contract Between Owner and Contractor General Conditions of the Contract for Construction including as follows:
  1. By the execution of a Change Order, the Contractor agrees and acknowledges that it has had sufficient time and opportunity to examine the change in Work which is the subject of the Change Order and that it has undertaken all reasonable efforts to discover and disclose any concealed or unknown conditions which may, to any extent, affect the Contractor’s ability to perform in accordance with the Change Order. Aside from those matters specifically set forth in the Change Order, the Owner shall not be obligated to make any adjustments to either the Contract Sum or Contract Time by reason of any conditions affecting the change in Work addressed by the
Change Order that could have reasonably been discovered or disclosed by the Contractor’s examination.

2. Any Change Order fully executed by the Owner, Contractor and Design Professional, including but not limited to, a Change Order arising by reason of the parties’ mutual agreement or by mediation, shall constitute a final and full settlement of all matters relating to or affected by the change in the Work, including but not limited to, all direct and consequential costs associated with such change and any and all adjustments to the Contract Price and Contract Time. In the event a Change Order increases the Contract Price, the Contractor shall include the Work covered by such Change Order in the Application for Payment as if such Work was originally part of the Project and Contract Documents.

FAILURE TO EXECUTE THIS ACKNOWLEDGMENT MAY MAKE YOUR BID NON-RESPONSIVE.

I, _________________________________________________, being duly authorized to bind the (type or print name of individual) bidder, _________________________________________________, does hereby certify that I have fully read (type or print name of company) and understand this document and that it highlights certain parts of the Contract that will be entered between the parties and that will govern this Project.

Authorized Signature: _________________________________

Title: _______________________________________________

Date: _______________________________________________
IDAHO TRANSPORTATION DEPARTMENT
FIXED PRICE CONSTRUCTION CONTRACT
BETWEEN OWNER AND CONTRACTOR

ITD PROJECT NO. FM32004
Materials Training Lab Renovation
Idaho Transportation Department
8150 Chinden Blvd
Boise, Idaho 83714
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BETWEEN OWNER AND CONTRACTOR

THIS FIXED PRICE CONSTRUCTION CONTRACT BETWEEN OWNER AND CONTRACTOR (the “Contract”) is by and between the State of Idaho, Idaho Transportation Department (“ITD” or the "Owner") and (insert name of contractor)(the “Contractor”) and is for the construction of the project (the “Project”) identified as ITD Project No. FM32004, as more fully described in Exhibit A, and incorporated herein by reference. This Contract shall be effective on _______ (day) of __________ (month), 2019 (year), when executed by both parties.

In consideration of the mutual promises, covenants, and agreements stated herein, and for other good and valuable consideration, the sufficiency of which is hereby acknowledged, the Owner and the Contractor agree:

ARTICLE 1
CONTRACT DOCUMENTS

1.1 The Contract Documents consist of this Contract, the drawings and specifications for the Project (the “Drawings and Specifications”) identified in Exhibit C and any Addenda thereto issued prior to execution of this Contract, written amendments signed by both the Owner and the Contractor, Change Orders signed by both the Owner and the Contractor, Construction Change Directives and any written orders by the Design Professional for minor changes in the Work (the “Contract Documents”). Documents not included or expressly contemplated in this Article 1 do not, and shall not, form any part of the Contract Documents.

1.2 The term “Work” means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor’s obligations.

ARTICLE 2
REPRESENTATIONS AND WARRANTIES OF THE CONTRACTOR

In order to induce the Owner to execute this Contract and recognizing that the Owner is relying thereon, the Contractor, by executing this Contract, makes the following express representations to the Owner:

2.1 The Contractor is fully qualified to act as the Contractor for the Project and has, and shall maintain, any and all licenses, permits or other authorizations necessary to act as the Contractor for, and to construct, the Project.

2.2 The Contractor has become familiar with the Project site and the local conditions under which the Project is to be constructed and operated particularly in correlation to the requirements of the Contract.
2.3 The Contractor has received, reviewed, compared, studied and carefully examined all of the documents which make up the Contract Documents, including the Drawings and Specifications, and any Addenda, and has found them in all respects to be complete, accurate, adequate, consistent, coordinated and sufficient for construction. Such review, comparison, study and examination shall be a warranty that the contractor believes that the documents are complete and the Project is buildable as described except as reported.

2.4 The Contractor warrants that the Contract Time is a reasonable period for performing the Work.

2.5 The Contractor warrants to the Owner and Design Professional that all labor furnished on this Project shall be competent to perform the tasks undertaken; materials and equipment furnished under the Contract will be new and of high quality unless otherwise required or permitted by the Contract Documents; that the Work will be complete, of high quality and free from defects not inherent in the quality required or permitted; and that the Work will strictly conform to the requirements of the Contract Documents. Any Work not strictly conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse by Owner or its representatives, modifications not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Owner, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. This warranty shall survive the completion of the Contract and final payment to the Contractor.

ARTICLE 3
INTENT AND INTERPRETATION

With respect to the intent and interpretation of this Contract, the Owner and the Contractor agree as follows:

3.1 This Contract constitutes the entire and exclusive agreement between the parties with reference to the Project, and supersedes any and all prior discussions, communications, representations, understandings, negotiations or agreements. This Contract also supersedes any bid documents.

3.2 The intent of the Contract is to include all items necessary for the proper execution and completion of the Project and anything that may be required, implied or inferred by the documents which make up this Contract, or any one or more of them, shall be provided by the Contractor for the Fixed Price Contract Amount. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all.

3.3 Nothing contained in this Contract shall create, nor be interpreted to create, privity or any other relationship whatsoever between the Owner and any person or entity except the Contractor; provided, however, that the Design Professional is entitled to performance and enforcement of obligations under the Contract intended or necessary to facilitate its duties. Any reference to the Owner, the Contractor or the Design Professional shall be deemed to include authorized representatives.
3.4 When a word, term or phrase is used in this Contract, it shall be interpreted or construed first as defined herein; second, if not defined, according to its generally accepted meaning in the construction industry; and third, if there is no generally accepted meaning in the construction industry, according to its common and customary usage.

3.5 The words "include," "includes," or "including," as used in this Contract, shall be deemed to be followed by the phrase "without limitation."

3.6 The specification herein of any act, failure, refusal, omission, event, occurrence or condition as constituting a material breach of this Contract shall not imply that any other, non-specified act, failure, refusal, omission, event, occurrence or condition shall be deemed not to constitute a material breach of this Contract.

3.7 The Contractor shall have a continuing duty to read, examine, review, compare and contrast each of the documents which make up this Contract, shop drawings and other submittals, and shall give timely written notice to the Owner and the Design Professional of any conflict, ambiguity, error or omission which the Contractor may find with respect to these documents before proceeding with the affected Work.

3.8 The express or implied approval by the Owner or the Design Professional of any shop drawings or other submittals shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this Contract. The Owner has requested that the Design Professional prepare documents for the Project, including the Drawings and Specifications for the Project, which are accurate, adequate, consistent, coordinated and sufficient for construction. HOWEVER, THE OWNER MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO THE CONTRACTOR CONCERNING SUCH DOCUMENTS. The Contractor again hereby acknowledges and represents that it has received, reviewed and carefully examined such documents; has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction; and that the Contractor has not, does not and will not rely upon any representations or warranties by the Owner concerning such documents, as no such representations or warranties have been or are hereby made.

3.9 In the event of any conflict among any of the documents which make up this Contract, the Design Professional shall interpret the documents, and the interpretation shall be binding on both the Owner and Contractor; provided, however, that this does not change the Owner’s right to make decisions regarding Claims in accordance with Article 13 and Article 14. If no interpretation is provided by the Design Professional, the most stringent requirement in the Contract Documents will apply.

ARTICLE 4
OWNERSHIP OF DOCUMENTS

4.1 Unless otherwise agreed by the Design Professional and its consultants, the party that prepared the drawings, specifications and other documents is the author of such with all copyright, common law, statutory and other reserved rights. The Contractor may retain one (1) record set of the Drawings and Specifications and other documents but shall not own or claim any copyright in them.
The Drawings and Specifications and other documents, and any copies, are to be used solely for this Project, and not on any other project, or additions to this Project outside this Contract, without written consent of the Owner, the Design Professional and the Design Professional’s consultants; provided, however, that copies may be made of applicable portions as necessary for completion of the Work. Such copies shall include any copyright notice on the Drawings and Specifications and other documents.

Submission to or use by a regulatory body related to this Project is an acceptable use.

ARTICLE 5
CONTRACTOR’S PERFORMANCE

The Contractor shall perform all of the Work required, implied or reasonably inferable from this Contract, including the following:

5.1 Construction of the Project.

5.2 The furnishing of any required surety bonds and insurance.

5.3 The provision or furnishing, and prompt payment therefore, of labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, fuel, heat, light, cooling or other utilities required for construction and all necessary permits, including any required elevator permits, required for the construction of the Project. Construction projects for the State of Idaho require a building permit issued by the Division of Building Safety.

5.4 The creation and submission of a detailed and comprehensive set of marked up blue or black-lined record drawings. Said record drawings shall be submitted to and approved by the Design Professional as a condition precedent to final payment to the Contractor.

ARTICLE 6
TIME FOR CONTRACTOR’S PERFORMANCE

6.1 The Contractor shall commence the performance of this Contract in accordance with the "Notice to Proceed" (Exhibit F) issued by the Owner and shall diligently continue its performance to and until final completion of the Project. The Contractor shall accomplish Substantial Completion of the Project on or before the time indicated in Exhibit A. The period of time, including any adjustments made under this Contract, for the Contractor to reach Substantial Completion is the "Contract Time."

6.2 The Contractor may be assessed by and be responsible to the Owner for the amount indicated in Exhibit A per day for each and every calendar day of unexcused delay in achieving Substantial Completion beyond the date set forth for Substantial Completion. Any sums owed hereunder by the Contractor shall be payable not as a penalty but as liquidated damages, representing an estimate of delay damages likely to be sustained by the Owner estimated at the time of this Contract. When the Owner reasonably believes that Substantial Completion will be inexcusably delayed, the Owner shall be entitled, but not required, to withhold from any amounts otherwise due the Contractor an amount then believed by the Owner to be adequate to recover liquidated damages applicable to such delays. If and when the Contractor overcomes
the delay in achieving Substantial Completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages. The Owner’s right to liquidated damages is not, and shall not be deemed to be, an exclusive remedy for delay and the Owner shall retain all remedies at law or in equity for delay or other breach.

6.3 The term “Substantial Completion,” as used herein, shall mean that point at which, as certified in writing by the Design Professional, or if there is no Design Professional, as certified by the Owner, the entire Project is at a level of completion in strict compliance with the Contract Documents, such that the Owner or its designee can enjoy beneficial use or occupancy and can use or operate it in all respects for its intended purpose. If, in the reasonable determination of the Owner, receipt of operation and maintenance manuals or completion of training is necessary for such beneficial use or occupancy, then there shall be no Substantial Completion until such manuals are provided or such training is completed. Partial use or occupancy of the Project shall not result in the Project being deemed substantially complete, or accepted as substantially complete, and such partial use or occupancy shall not be evidence of Substantial Completion. The Project shall not be deemed accepted until it is finally complete.

6.4 Any request by the Contractor for an extension of the Contract Time must be made in accordance with, and is subject to, Article 13 and Article 14 related to Claims.

6.5 The Owner shall have no liability of any kind to the Contractor if a schedule or other document submitted by the Contractor shows an intention to complete the Work prior to the scheduled completion date and for any reason other than Owner caused delay, the Contractor is not able to achieve such early completion.

ARTICLE 7
FIXED PRICE AND CONTRACT PAYMENTS

7.1 The Owner shall pay, and the Contractor shall accept, as full and complete payment for the Contractor’s timely performance of its obligations hereunder, the Fixed Price Contract Amount indicated in Exhibit A. The Fixed Price Contract Amount shall not be modified except as provided in this Contract.

7.2 Prior to approval of the contract, the Contractor shall prepare and present to the Owner and the Design Professional the Contractor’s Schedule of Values apportioning the Fixed Price Contract Amount among the different elements of the Project for purposes of periodic and final payment. The Contractor’s Schedule of Values shall be presented in the Owner’s web-based construction management software. The Contractor shall not imbalance it’s Schedule of Values nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of this Contract. The Contractor’s Schedule of Values will be utilized for the Contractor’s requests for payment but shall only be so utilized after it has been approved in writing by the Design Professional.

7.3 The Owner shall pay the Fixed Price Contract Amount to the Contractor in accordance with the procedures set forth in this Article. The Contractor shall submit a Contractor’s Request for Payment, on or before the day of each month indicated in Exhibit A or otherwise agreed to, after commencement of performance, but no more frequently than once monthly. Said payment request shall be made in the Owner’s web-based construction management software, and
shall include whatever supporting information as may be required by the Design Professional, the Owner or both. Therein, the Contractor may request payment for one hundred percent (100%) of the Work satisfactorily completed to the date of the Contractor’s Request for Payment, less five percent (5%) retainage, based on the Fixed Price Contract Amount allocated on the Schedule of Values. The Contractor’s Request for Payment may include only: properly provided labor, materials or equipment properly incorporated into the Project, and time and materials or equipment necessary for the Project or that will be incorporated into the Project and are properly stored at the Project site (or elsewhere if off-site storage is approved in writing by the Owner). The Contractor’s Request for Payment must exclude the total amount of previous payments received from the Owner. Any payment on account of stored materials or equipment will be subject to the Contractor providing written proof that the Owner has title to such materials or equipment and that they are fully insured against loss or damage. Each such Contractor’s Request for Payment shall be signed by the Contractor and its submission shall constitute the Contractor’s affirmative representation that the quantity of Work has reached the level for which payment is requested; that the Work has been properly installed or performed in strict compliance with the Contract; that all Work for which the Owner has previously paid is free and clear of any lien, claim or other encumbrance of any person whatsoever; and that the Contractor knows of no reason why payment should not be made as requested. As a condition precedent to payment, the Contractor shall, if required by the Owner, furnish to the Owner properly executed waivers or releases, in a form acceptable to the Owner, from all subcontractors, materialmen, suppliers or others having any claims or alleged claims, wherein said subcontractors, materialmen, suppliers or others shall acknowledge receipt of all sums due pursuant to all prior Contractor’s Requests for Payment, and waive and relinquish any rights or other claims relating to the Project or Project site. The submission by the Contractor of the Contractor’s Request for Payment also constitutes the Contractor’s affirmative representation that, upon payment of the Contractor’s Request for Payment submitted, title to all Work included in such payment shall be vested in the Owner.

Thereafter, the Design Professional shall review the Contractor’s Request for Payment and may also review the Work at the Project site or elsewhere to determine whether the quantity and quality of the Work are as represented in the Contractor’s Request for Payment and as required by this Contract. The Design Professional shall approve in writing the amount which, in the opinion of the Design Professional, is properly owing to the Contractor and such approval is required before the Owner shall have any payment obligation. The Design Professional may withhold such approval, in whole or in part, as necessary to protect the Owner if it reasonably believes that the quantity or quality of the Work is not as represented in the Contractor’s Request for Payment or is not in strict conformance to the Contract Documents.

7.4 The Owner shall make payment to the Contractor no more than twenty-one (21) days following receipt by the Owner of the Design Professional’s written approval of each Contractor’s Request for Payment. The amount of each such payment shall be the amount approved for payment by the Design Professional less such amounts, if any, otherwise owing by the Contractor to the Owner or which the Owner shall have the right to withhold as authorized by this Contract. The Design Professional’s approval of the Contractor’s Request for Payment shall not preclude the Owner from the exercise of any of its rights it may have in this Contract, at law or in equity, as set forth in Paragraph 7.8 hereinafter.
7.5 Off-site storage will not be approved at locations more than thirty (30) miles from the Project site or outside the State of Idaho and any payment for any off-site storage is subject to the following:

.1 The Contractor must provide at least thirty (30) days’ advance written notice of its request to store off-site. Such notice must include a description of the type, quantities, locations and values of materials involved for the next billing cycle. All invoices must indicate the type, quantities and value of materials or equipment for which payment is requested;

.2 All materials stored off-site must be segregated and clearly marked with the DPW Project number and as being the “Property of the State of Idaho;”

.3 The Design Professional and/or the Owner’s Field Representative must have unrestricted access to the stored materials during all business hours and may physically inventory all invoiced materials and equipment and may physically inspect the storage conditions;

.4 The Contractor must provide written Consent of Surety to off-site storage of materials and equipment and to payment for such materials and equipment prior to incorporation in the Work. Consent must be from the Surety. Consent of local broker or agent is not acceptable;

.5 The Contractor must maintain and must provide to the Design Professional, upon request, a current log of stored materials and equipment, which reflects when materials and equipment are used or added; and

.6 The Contractor must obtain and maintain all risk property insurance at replacement cost, with the State of Idaho listed as loss payee on all materials and equipment stored off-site and in transit.

7.6 When payment is received from the Owner, the Contractor shall immediately pay all subcontractors, materialmen, laborer and suppliers the amounts they are due for the Work covered by such payment. The Contractor shall not withhold from a subcontractor or supplier more than the percentage withheld from a payment certificate for the subcontractor’s or supplier’s portion of the Work. In the event the Owner becomes informed that the Contractor has not paid a subcontractor, materialmen, laborer or supplier as provided herein, the Owner shall have the right, but not the duty, to issue future checks and payment to the Contractor of amounts otherwise due hereunder naming the Contractor and any such subcontractor, materialmen, laborer or supplier as joint payees. Such joint check procedure, if employed by the Owner, shall create no rights in favor of any person or entity beyond the right of the named payees to payment of the check and shall not be deemed to commit the Owner to repeat the procedure in the future.

7.7 Payment to the Contractor, utilization of the Project for any purpose by the Owner, or any other act or omission by the Owner shall not be interpreted or construed as an acceptance of any Work of the Contractor not strictly in compliance with this Contract.

7.8 The Owner shall have and be entitled to the right to refuse to make any payment, including by reducing payment under any Contractor’s Request for Payment, and, if necessary,
may demand the return of a portion or all of an amount previously paid to the Contractor for reasons that include the following:

.1 The quality of the Contractor's work, in whole or part, is not in strict accordance with the requirements of this Contract or identified defective work, including punch list work, is not remedied as required by the Contract Documents;

.2 The quantity of the Contractor's work, in whole or in part, is not as represented in the Contractor's Request for Payment or otherwise;

.3 The Contractor's rate of progress is such that, in the Owner's opinion, Substantial Completion or final completion, or both, may be inexcusably delayed or that the Owner will incur additional costs or expense related to repeated Substantial Completion or final completion inspections through no fault of the Owner;

.4 The Owner reasonably believes that the Contractor has failed to use Contract funds, previously paid the Contractor by the Owner, to pay Contractor's project-related obligations, including subcontractors, laborers and material and equipment suppliers;

.5 There are claims made or it seems reasonably likely that claims will be made, against the Owner;

.6 The Contractor has caused a loss or damage to the Owner, the Design Professional or another contractor;

.7 The Owner reasonably believes that the Project cannot be completed for the unpaid balance of the Fixed Price Contract Amount or the Owner reasonably believes that the Project cannot be completed within the Contract Time and that the unpaid balance of the Fixed Price Contract Amount would be inadequate to cover the cost of actual or liquidated damages for the anticipated delay;

.8 The Contractor fails or refuses to perform any of its obligations to the Owner; or

.9 The Contractor fails to pay taxes as required by Title 63, Chapter 15, Idaho Code.

In the event that the Owner makes written demand upon the Contractor for amounts previously paid by the Owner as contemplated in Paragraph 7.8, the Contractor shall promptly comply with such demand.

7.9 If the Owner, without cause, fails to pay the Contractor any amounts due and payable thirty (30) days after those amounts are due pursuant to Paragraph 7.4, the Contractor shall have the right to cease the Work until receipt of proper payment. Contractor must first provide written notice to the Owner of the Contractor's intent to cease the Work ten (10) days prior to stopping the Work under this Paragraph. If any amounts remain unpaid after fifty-one (51) days after the Design Professional approves the Contractor's Request for Payment under Paragraph 7.4, interest at the rate of four percent (4%) per annum shall accrue on those unpaid amounts.

7.10 When Contractor considers Substantial Completion has been achieved, the Contractor shall notify the Owner and the Design Professional in writing and shall furnish to the Design Professional a listing of those matters yet to be finished. The Design Professional will thereupon conduct an inspection to confirm that the Work is, in fact, substantially complete. Upon its
confirmation that the Contractor’s work is substantially complete, the Design Professional will so notify the Owner and Contractor in writing and will therein set forth the date of Substantial Completion. The Owner and the Contractor must accept the date of Substantial Completion in writing. Guarantees and warranties required by this Contract shall commence on the date of Substantial Completion. At the Contractor’s Request for Payment following Substantial Completion, the Owner shall pay the Contractor an amount sufficient to increase total payments to the Contractor to ninety-five percent (95%) of the Fixed Price Contract Amount, less any liquidated damages, less the reasonable costs as determined by the Design Professional for completing all incomplete work, correcting and bringing into conformance all defective and nonconforming work, and handling any outstanding or potential claims. If the Design Professional determines that the Contractor has made or is making satisfactory progress on any uncompleted portions of the Work, the Owner may, at its discretion, release a portion of the retainage to the Contractor prior to the actual final completion of the conditions set forth in Paragraph 7.13. It is the intent of the parties that the Project will be accepted only in total (at Substantial Completion and final completion) and not in phases unless provided for in Exhibit A. Any acceptance other than in total shall require written agreement of Owner and Design Professional.

7.11 When Contractor considers the Project is at final completion, it shall notify the Owner and the Design Professional thereof in writing. Thereupon, the Design Professional will perform a final inspection of the Project. If the Design Professional confirms that the Project is complete in full accordance with the Contract Documents and that the Contractor has performed all of its obligations to the Owner, the Design Professional will furnish a final approval for payment to the Owner certifying to the Owner that the Project is complete and the Contractor is entitled to the remainder of the unpaid Fixed Price Contract Amount, less any amount withheld pursuant to this Contract.

7.12 If the Contractor fails to achieve final completion within a reasonable number of days as established by the Design Professional from the date of Substantial Completion, the Contractor may be assessed and be responsible to the Owner for fifty percent (50%) of the daily amount of liquidated damages as established pursuant to Paragraph 6.2 and Exhibit A, per day for each and every calendar day of unexcused delay in achieving final completion beyond the date established for final completion of the Work. Any sums due and payable hereunder by the Contractor shall be payable not as a penalty but as liquidated damages representing an estimate of delay damages likely to be sustained by the Owner, estimated at or before the time of executing this Contract. When the Owner reasonably believes that final completion will be inexcusably delayed, the Owner may withhold from any amounts otherwise due the Contractor an amount then believed by the Owner to be adequate to recover liquidated damages applicable to such delays. If and when the Contractor overcomes the delay in achieving final completion, or any part thereof, for which the Owner has withheld payment, the Owner shall promptly release to the Contractor those funds withheld, but no longer applicable, as liquidated damages. The Owner’s right to liquidated damages is not, and shall not be deemed to be, an exclusive remedy for delay and the Owner shall retain all remedies at law or in equity for delay or other breach.

7.13 As a condition precedent to final payment, the Contractor must furnish the Owner, in the form and manner required by Owner, and with a copy to the Design Professional of the following:
.1 An affidavit that all of the Contractor's obligations to subcontractors, laborers, equipment or material suppliers or other third parties in connection with the Project have been paid or otherwise satisfied;

.2 A release by the Contractor of all Claims it has or might have against the Owner or the Owner's property (DPW's form, Exhibit H);

.3 Contractor's Affidavit of Debts and Claims (AIA Document G706);

.4 Consent of Surety to final payment (AIA Document G707);

.5 Confirmation of all required training, product warranties, operating manuals, instruction manuals and other record documents, drawings and things customarily required of the Contractor; and


7.14 The Owner shall, subject to its rights set forth in this Contract, make final payment of all sums due the Contractor within thirty (30) days of the Design Professional's execution of a final approval for payment and receipt of documentation required by Paragraph 7.13, whichever is received later.

ARTICLE 8
INFORMATION AND MATERIAL SUPPLIED BY THE OWNER

8.1 The Administrator of DPW or his designee shall be the sole representative of the State of Idaho. The Design Professional shall have authority to bind Owner only as specifically set forth in this Contract.

8.2 The Owner will assign a Project Manager and a Field Representative to represent the Owner, identified in Exhibit B. The Owner's Field Representative's duties, responsibilities and limitations of authority are in accordance with DPW's policies and procedures.

8.3 The Owner shall furnish to the Contractor, prior to the execution of this Contract, any and all written and tangible material in its possession concerning conditions below ground at the site of the Project. Such written and tangible material is furnished to the Contractor only in order to make complete disclosure of such material as being in the possession of the Owner and for no other purpose. By furnishing such material, the Owner does not represent, warrant or guarantee its accuracy, either in whole in part, implicitly or explicitly.

8.4 The Owner will secure and pay for all required easements, the plan check fee required by the Division of Building Safety, conditional use permits and any other permits and fees specifically indicated in the Contract Documents to be secured and paid for by the Owner.

8.5 The Owner will provide the Contractor one (1) copy of this complete Contract and the number of sets of Drawings and Project Manuals (including Specifications) as indicated in Exhibit A. The Contractor may purchase additional copies, at its expense, from the Design Professional.
ARTICLE 9
STOP WORK ORDER

9.1 In the event the Contractor fails or refuses to perform the Work as required or fails or refuses to correct nonconforming Work, the Owner may instruct the Contractor to stop Work in whole or in part. Upon receipt of such instruction, the Contractor shall immediately stop as instructed by the Owner and shall not proceed further until the cause for the Owner's instructions has been corrected, no longer exists or the Owner instructs that the Work may resume. In the event the Owner issues such instructions to stop, and in the further event that the Contractor fails and refuses within seven (7) days of receipt of same to provide adequate assurance to the Owner that the cause of such instructions will be eliminated or corrected, then the Owner shall have the right, but not the obligation, to carry out the Work with its own forces or with the forces of another contractor, and the Contractor shall be fully responsible and liable for the costs of performing such Work by the Owner. Without limiting what else might constitute nonconforming Work, the existence of a gross safety violation or other situation or condition that creates, or could imminently create, a threat of serious harm to persons or property, shall constitute nonconforming Work and any order to stop the Work issued for such reason shall not be considered an interference with the Contractor's performance of the Work or its means and methods. The rights set forth herein are in addition to, and without prejudice to, any other rights or remedies the Owner may have against the Contractor.

9.2 Any order to stop the Work issued pursuant to Paragraph 9.1 shall not be used to justify any Claim by the Contractor for additional time or money.

ARTICLE 10
DUTIES, OBLIGATIONS AND RESPONSIBILITIES OF THE CONTRACTOR

In addition to any and all other duties, obligations and responsibilities of the Contractor set forth in this Contract, the Contractor shall have and perform the following duties, obligations and responsibilities to the Owner:

10.1 The Contractor's continuing duties set forth in Paragraph 3.7 are by reference hereby incorporated in this Paragraph 10.1. The Contractor shall not perform Work without adequate plans and specifications or, as appropriate, approved shop drawings or other submittals. If the Contractor performs Work knowing or believing it involves an error, inconsistency or omission in the Contract without first providing written notice to the Design Professional and Owner, the Contractor shall be responsible for such Work and shall pay the cost of correcting same.

10.2 The Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to the Contractor with the Contract Documents before commencing Work. Errors, inconsistencies or omissions discovered shall be reported to the Design Professional, the Owner and the Owner's Field Representative immediately. Such examination, review and comparison shall be a warranty that the Contract Documents are complete and the Project is buildable as described except as reported. Reported errors, inconsistencies or omissions will constitute a request for an interpretation by the Design Professional and may constitute a claim pursuant to Article 13 hereof where appropriate.
10.3 The Contractor shall ensure that all Work shall strictly conform to the requirements of this Contract.

10.4 The Work shall be strictly supervised, the Contractor bearing full responsibility for any and all acts or omissions of those engaged in the Work on behalf of the Contractor.

10.5 All labor furnished on this Project shall be competent to perform the tasks undertaken; materials and equipment furnished under the Contract will be new and of high quality unless otherwise required or permitted by the Contract Documents; the Work will be complete, of high quality and free from defects not inherent in the quality required or permitted; and the Work will strictly conform to the requirements of the Contract Documents. Any Work not strictly conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective.

10.6 Except as provided in Paragraph 8.4, the Contractor shall secure or provide and pay for all licenses, permits required by the Idaho Division of Building Safety, governmental approvals and inspections, connections for outside services for the use of municipal or private property for storage of materials, parking, utility services, temporary obstructions, enclosures or opening and patching of streets, and for all other facilities and services necessary for proper execution and completion of the Project.

10.7 The Contractor shall comply with and give notices required by laws, ordinances, rules, regulations and lawful orders of public authorities bearing on performance of the Work.

10.8 The Contractor shall employ and maintain at the Project site only competent supervisory personnel. Key supervisory personnel assigned by the Contractor to this Project are as listed in Exhibit B.

10.9 The Contractor shall employ a competent superintendent and necessary assistants, as needed, to oversee execution of the Work. The superintendent shall be in attendance at the Project site during the progress of the Work. The superintendent and any project manager, if the Contractor utilizes a project manager, shall be reviewed and must be approved by the Design Professional and Owner, and neither shall be changed except with the consent of the Design Professional and Owner, unless the superintendent and/or project manager cease to be employed by the Contractor. Under this circumstance, any new superintendent or new project manager must be satisfactory to the Design Professional and Owner. Such approval shall not be unreasonably withheld. The superintendent and any project manager shall represent the Contractor and all communications given to the superintendent or project manager are deemed given to the Contractor.

10.10 So long as the individuals named above remain actively employed or retained by the Contractor, they shall perform the functions indicated next to their names unless the Owner agrees to the contrary in writing. In the event one or more individuals not listed in Paragraph 10.9 subsequently assumes one or more of those functions listed in Paragraph 10.9, the Contractor shall be bound by the provisions of this paragraph as though such individuals had been listed in Paragraph 10.9.

10.11 The Contractor shall provide to the Owner and the Design Professional a milestone schedule for completing the Work within the Contract Time. Such schedule shall be in a form
specified in Division 1 of the Specifications and be acceptable to the Owner and to the Design Professional. The schedule must be submitted to and accepted by the Design Professional prior to the first request for payment unless required earlier by Division 1 of the Specifications. The Contractor's milestone schedule must be updated as required by the Design Professional and/or the Owner to reflect conditions encountered and shall apply to the total Project. The Contractor's revisions to the schedule shall not constitute a waiver of the requirement to complete the Project in the time allowed by the Contract, unless additional time for performance has been allowed pursuant to a Change Order. Any changes in milestone begin or end dates must be furnished to the Owner and the Design Professional. Strict compliance with the requirements of this Paragraph shall be a condition precedent to the payment to the Contractor and failure by the Contractor to strictly comply with said requirements shall constitute a material breach of this Contract.

10.12 Unless otherwise provided in the Construction Documents, on all projects where the Fixed Price Contract Amount is over $1,000,000, the Contractor shall schedule and perform the Work in accordance with a Critical Path Method (“CPM”) to indicate the rate of progress and practical order of the Project. The purpose of this scheduling requirement is to assure adequate planning, coordination and execution of the Work. The schedule shall indicate the dates for starting and completing major work activities, project events, major equipment, material and equipment submittals and delivery of major items. Project activities having critical time restraints on action, required by the Owner, shall be shown as scheduled milestones. The Contractor's schedule shall demonstrate the order, interdependence and sequence of activities. Critical paths shall be highlighted or distinguished. The schedule shall include all the dates specified in the Contract for Substantial Completion and final completion of the Work. The time limit set forth in the Contract for Substantial Completion and final completion must govern; the schedule must be adjusted to meet these dates. Schedule float shall belong to the Project. The Contractor shall submit to the Owner and Design Professional a CPM schedule within three (3) weeks after award of the Contract and maintain such schedule on a current basis in accordance with the Contract Documents.

10.13 Once a month, or at intervals as required by the Design Professional, the Contractor shall advise the Owner and the Design Professional of the status of the Work (in duplicate) on the current milestone schedule. If any project milestone dates are not met on schedule, the Contractor shall immediately advise the Owner and Design Professional in writing of the proposed action to bring the Work on schedule. The Contractor shall also submit a detailed short term schedule, as required by Division 1 of the Specifications, each month. This short term schedule shall include a description of current and anticipated problem areas, delaying factors and their impact, and explanation of corrective action taken or proposed. If the Work is behind schedule, the Contractor shall indicate what measures it will take to put the Work back on schedule.

10.14 If the Work is not progressing through no fault of the Owner or the Design Professional, as shown on the milestone schedule, as determined by the Design Professional, and the Owner and the Design Professional do not believe the Contractor's proposed action to bring the Work on schedule is adequate, then the Contractor shall be deemed in default under this Contract and the progress of the Work shall be deemed unsatisfactory. In such event, the Owner, at its discretion, may require the Contractor to work such additional time over regular hours, including Saturdays, Sundays and holidays, without additional cost to the Owner to bring the Work on schedule.
10.15 The Contractor shall keep an updated copy of the Drawings and Project Manual (including Specifications) and Addenda at the site. Additionally, the Contractor shall keep a current submittal schedule and a copy of approved shop drawings and other submittals. All of these items shall be available to the Owner and the Design Professional at all regular business hours. Upon final completion of the Work, all of these items must be updated by the Contractor and provided to the Design Professional and shall become the property of the Owner.

10.16 The Contractor shall carefully review and inspect for compliance with the Contract Documents, the shop drawings and other submittals (including product data and samples) required by the Contract Documents and shall submit to the Design Professional only submittals approved in accordance with this section. Such review and submittal shall be done promptly and in a sequence that will not delay its Work under this Contract or the activities of the Owner or of separate contractors. Shop drawings and other submittals from the Contractor do not constitute a part of the Contract. The Contractor shall not do any work requiring shop drawings or other submittals unless the Design Professional has verified compliance in writing. All Work requiring verified shop drawings or other submittals shall be done in strict compliance with such approved documents. However, verification of compliance by the Design Professional shall not be evidence that Work installed pursuant thereto conforms with the requirements of this Contract. The Design Professional shall have no duty to review submittals that are not Contractor approved, partial submittals or incomplete submittals. The Contractor shall maintain a submittal log which shall include, at a minimum, the date of each submittal, the date of any re-submittal, the date of any approval or rejection and the reason for any rejection.

10.17 The Contractor shall maintain the Project site in a reasonably clean condition during performance of the Work. Upon final completion, the Contractor shall thoroughly clean the Project site of all debris, trash and excess materials or equipment.

10.18 At all times relevant to this Contract, the Owner and the Design Professional shall have a right to enter the Project site and the Contractor shall allow the Owner and/or the Design Professional to review or inspect the work without formality or other procedure.

10.19 The presence or duties of the Design Professional's or the Owner's personnel or representatives at the construction site, does not make any of them responsible for those duties that belong to the Contractor or other entities and does not relieve the Contractor or any other entities of their obligations, duties and responsibilities, including any obligation or requirement to have or to implement any health or safety plans or precautions. Except as provided in Paragraph 10.9, Design Professional's and Owner's personnel have no authority to exercise any control over any Contractor or other entities or their employees in connection with their work or any health or safety precautions and have no duty for inspecting, noting, observing, correcting or reporting on health or safety deficiencies of the Contractor or other entities or any other persons at the site except their own personnel. The presence of Design Professional's or Owner's personnel at a construction site is for the purpose of providing to Owner a greater degree of confidence that the completed Work will conform to the Contract Documents and that the integrity of the design concept as reflected in the Contract Documents has been implemented and preserved by the Contractor. For this Contract only, construction sites include places of manufacture for materials incorporated into the construction Work and Contractor includes manufacturers of materials incorporated into the construction Work.
ARTICLE 11
INDEMNITY

11.1 The Contractor shall defend, indemnify and hold harmless the Owner, Design Professional, [and the Idaho State Building Authority] and their employees, officers and agents harmless from any and all claims, liabilities, damages, losses, costs and expenses of every type whatsoever, including attorney fees and expenses, arising out of or resulting from the Contractor's work, acts or omissions under or related to the Contract Documents, to the extent caused by the Contractor, or anyone for whose acts the Contractor may be liable, regardless of whether such liability, claim, damage, loss, cost or expense is caused in part by the Owner.

11.2 The limits of any insurance of the Contractor shall not be, and shall not be deemed to be, a limitation of the Contractor's defense and indemnity obligations contained in this Article.

11.3 In claims against any person or entity indemnified under this Article by an employee of the Contractor, a subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under this Article shall not be limited by a limitation on amount or type of damages, compensation or benefits payable by or for the Contractor or a subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 12
THE DESIGN PROFESSIONAL

The Design Professional for this Project is identified in Exhibit B, incorporated herein by reference, along with any authorized representatives and any limitations of responsibility. For the purpose of this Contract, the "Design Professional" means the properly licensed architect, properly registered professional engineer or other professional licensed in the State of Idaho who prepared the Drawings and Specifications for this Project. If the employment of the Design Professional is terminated, the Owner may retain a replacement professional and the role of the replacement professional shall be the same as the role of the Design Professional. Unless otherwise directed by the Owner in writing, the Design Professional will perform those duties and discharge those responsibilities allocated to the Design Professional in this Contract. The duties, obligations and responsibilities of the Design Professional shall be for contract administration and include the following:

12.1 Unless otherwise directed by the Owner in writing, the Design Professional shall not act as the Owner's agent.

12.2 Unless otherwise directed by the Owner in writing, the Owner and the Contractor shall communicate with each other through the Design Professional.

12.3 When requested by the Owner or Contractor in writing, the Design Professional shall within seven (7) days render written interpretations necessary for the proper execution or progress of the Work or shall provide a written explanation as to why more time is needed and provide a date by which it will be provided.

12.4 The Design Professional shall draft proposed change authorization(s).
12.5 The Design Professional shall review and verify compliance or respond otherwise as necessary concerning shop drawings or other submittals received from the Contractor.

12.6 The Design Professional shall be authorized to refuse to accept Work that is defective or otherwise fails to comply with the requirements of this Contract. If the Design Professional deems it appropriate, the Design Professional may, with the Owner's consent, require extra inspections or testing of the Work for compliance with the requirements of this Contract.

12.7 The Design Professional shall review the Contractor's Request for Payment and shall verify in writing those amounts which, in the opinion of the Design Professional, are properly owing to the Contractor as provided in this Contract.

12.8 The Design Professional shall, upon written request from the Contractor, perform Substantial Completion and final completion inspections contemplated by Article 6.

12.9 The Design Professional may require the Contractor to make changes which do not involve a change in the Fixed Price Contract Amount or in the Contract Time consistent with the intent of this Contract. Such changes shall be given to the Contractor in writing under signature of the Design Professional, with a copy to the Owner, and may be in the form of a supplemental instruction.

12.10 The Design Professional shall review and evaluate Claims and take other actions related to Claims in accordance with Articles 13 and 14.

12.11 The duties, obligations and responsibilities of the Contractor under this Contract shall in no manner whatsoever be changed, altered, discharged, released or satisfied by any duty, obligation or responsibility of the Design Professional. The Contractor is not a third-party beneficiary of any Contract by and between the Owner and the Design Professional. It is expressly acknowledged and agreed that the duties of the Contractor to the Owner are independent of, and are not diminished by, any duties of the Design Professional to the Owner.

ARTICLE 13
CLAIMS

13.1 For purposes of this Contract, a “Claim” means a demand by the Contractor to the Owner, or by the Owner to the Contractor, for a change in the Fixed Price Contract Amount, an extension of the Contract Time, an adjustment to or interpretation of the Contract terms, or other relief with respect to the terms of the Contract, which demand the Contractor or Owner asserts is required or allowed under the Contract Documents and which the Contractor and the Owner have previously discussed and failed to agree upon.

13.2 For the Claim to be considered, it must meet the following requirements:

.1 The Claim must be in writing;

.2 The Claim by the Contractor must be signed by an authorized representative of the Contractor, and the Claim by the Owner must be signed by an authorized representative of the Owner;
.3 The Claim by the Contractor must be provided to the Owner and to the Design Professional and the Claim by the Owner must be provided to the Contractor and to the Design Professional;

.4 The Claim must be made no later than ten (10) days after the event or first appearance of the circumstance giving rise to the Claim;

.5 The Claim must describe in detail all known facts and circumstances that the Contractor or Owner asserts support the Claim;

.6 The Claim must refer to the provision(s) of the Contract Documents that the Contractor or Owner asserts support the Claim;

.7 The Contractor or Owner must provide all documentation or other information to substantiate the Claim; and

.8 The Contractor or Owner must continue its performance under this Contract pending the resolution of any Claim; provided, however, that the Contractor shall not perform any additional or changed work not otherwise authorized in accordance with the Contract Documents.

13.3 The failure by the Contractor to meet any of the requirements of Paragraph 13.2 shall constitute a complete waiver by the Contractor of any rights arising from or related to the Claim. Similarly, the failure by the Owner to meet any of the requirements of Paragraph 13.2 shall constitute a complete waiver by the Owner of any rights arising from or related to the Claim.

13.4 If the Claim is made based on concealed or unknown site conditions, the following shall apply in addition to all other provisions applicable to the Claim:

.1 The condition must have been previously concealed and unknown or of a type not ordinarily encountered in the general geographic location of the Project and must not have been reasonably susceptible to discovery; and

.2 The Contractor shall notify the Design Professional and the Owner of the condition and shall not disturb the condition until the Design Professional and Owner have observed it or have waived in writing the right to observe it.

13.5 If the Claim by the Contractor is for an increase in the Fixed Price Contract Amount, the following shall apply in addition to all other provisions applicable to the Claim:

.1 Any increase in the Fixed Price Contract Amount shall be strictly limited to the direct costs incurred by the Contractor and shall not include any other costs, indirect or other, including any costs for or related to lost productivity, profit, home office overhead and any other overhead, legal fees, claim preparation, any matter previously resolved by a change order, equipment costs, costs related to the services of a project manager unless the project manager was required full time by the Owner or the Contract Documents, any costs associated with the failure to complete the Work early or in advance of the date required by the Contract Documents, it being specifically agreed to by the parties that there is no intention to have the Eichleay or other similar formula applicable to this Contract nor shall this Contract be deemed to be subject to any such formula; and
.2 The Owner shall have no liability for, and the Fixed Price Contract Amount shall not be increased related to, any claims of third parties, including subcontractors, unless and until the liability of the Contractor for such has been established in a court of competent jurisdiction and any such liability of the Owner shall be limited in the same manner as described in subparagraph 13.5.1.

13.6 If the Claim by the Owner is for a change in the Fixed Price Contract Amount, all other applicable provisions to the Claim apply.

13.7 If the Claim by the Contractor is for an extension of the Contract Time, the following shall apply in addition to all other provisions applicable to the Claim:

.1 The Contractor has been delayed in its performance by an act or omission of the Owner and through no fault of the Contractor;

.2 The Contractor has been delayed in its performance by unusually severe weather that could not reasonably have been anticipated or by another event not within its reasonable control;

.3 At the time it occurs or during its occurrence, the delay will preclude completion of the Project in the time required by the Contract Documents; and

.4 Any extension of the Contract Time shall be the Contractor’s sole and exclusive remedy for any delay except a delay caused by the active interference of the Owner with the Contractor’s performance which active interference continues after written notice to the Owner. The Owner’s exercise of any of its rights or remedies under this Contract, including ordering changes in the Work, directing suspension, rescheduling or correction of the Work, do not constitute active interference.

13.8 If a Claim is made based on an error, inconsistency or omission in the Contract that was reasonably susceptible to discovery by the Contractor and was not reported in accordance with Paragraph 2.3, that Claim shall be denied.

ARTICLE 14
RESOLUTION OF CLAIMS

14.1 All Claims made in accordance with Article 13 shall be reviewed and evaluated by the Design Professional. If the Claim is not made in strict accordance with Article 13, it shall be rejected as waived. Any failure by the Design Professional to reject the Claim for failure to meet the requirements of Article 13 is not binding on the Owner and the Owner may reject the Claim for such failure.

14.2 No later than seven (7) days from receipt of the Claim by the Design Professional, it shall:

.1 Make a written request to the Contractor or Owner for more data to support the Claim;

.2 Attempt to facilitate resolution of the Claim through informal negotiations; or
If the Claim is by the Contractor, make a written recommendation to the Owner, with a copy to the Contractor, that the Owner reject or approve all or part of the Claim and state the reasons for the Design Professional's recommendation. If the Claim is by the Owner, make a written recommendation to the Contractor, with a copy to the Owner, that the Contractor reject or approve all or part of the Claim and state the reasons for the Design Professional's recommendation.

14.3 If the Design Professional requests more data from the Contractor or the Owner under subparagraph 14.2.1, the Contractor or Owner shall respond no later than seven (7) days from receipt of such request, and provide additional data, provide a date certain by which additional data will be provided, or state that it will not provide additional data. Upon receipt of data, if any, in accordance with this section, the Design Professional will complete the evaluation of the Claim. Failure to respond at all or failure to provide data by the date specified in the response to the request shall result in the Claim being evaluated based on the information in the Design Professional's possession.

14.4 In evaluating the Claim, the Design Professional may consult with the Contractor, the Owner or other persons with knowledge or expertise that may assist the Design Professional in its evaluation.

14.5 No later than fourteen (14) days after receipt by the Owner of the Design Professional's recommendation regarding the Contractor's Claim, the Owner shall, in writing, notify the Contractor and the Design Professional of its decision regarding the Claim. No later than fourteen (14) days after receipt by the Contractor of the Design Professional's recommendation regarding the Owner's Claim, the Contractor shall, in writing, notify the Owner and the Design Professional of its decision regarding the Claim.

14.6 The Owner's decision regarding the Contractor's Claim is binding on the Owner and the Contractor but is subject to mediation in accordance with this Contract, and the Contractor's decision regarding the Owner's Claim is binding on the Owner and the Contractor but is subject to mediation in accordance with this Contract.

ARTICLE 15
SUBCONTRACTORS

15.1 A document in the form of Exhibit E shall be completed and submitted upon execution of this Contract and those subcontractors named therein shall match those subcontractors named in the Contractor's bid unless otherwise agreed to in writing by the Owner. Also upon execution of this Contract by the Contractor, the Contractor shall identify to the Owner and the Design Professional, in writing, those parties intended as subcontractors on the Project not otherwise named in Exhibit E. The Owner shall, in writing, state any objections the Owner may have to one or more of such subcontractors. The Contractor shall not enter into a subcontract with an intended subcontractor with reference to whom the Owner objects. All subcontracts shall afford the Contractor rights against the subcontractor which correspond to those rights afforded to the Owner against the Contractor herein, including those rights of Contract Termination as set forth in this Contract. All subcontractors shall, throughout the duration of this Contract, be properly licensed as Idaho Public Works Contractors.
15.2 The Contractor conditionally assigns each of its subcontracts related to the Project to the Owner. All subcontracts between the Contractor and the subcontractors shall obligate the subcontractor to such conditional assignment. Upon a Termination by the Owner for cause under Paragraph 20.1, the Owner may accept such conditional assignment by written notification to the applicable subcontractor and to the Contractor. Such acceptance is subject to the rights of the Surety, if any, relating to the Contract.

ARTICLE 16
CHANGES IN THE WORK

16.1 General

.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article and elsewhere in the Contract Documents; and

.2 Changes in the Work shall be performed under applicable provisions of the Contract Documents and the Contractor shall proceed promptly, unless otherwise provided in the Change Order, Construction Change Directive or order for a minor change in the Work.

16.2 Change Orders

.1 A “Change Order” is a written instrument prepared by the Design Professional and signed by the Owner, Contractor and Design Professional, stating their agreement upon: a change in the work, any adjustment in the Fixed Price Contract Amount and any adjustment in the Contract Time;

.2 Methods used in determining adjustments to the Fixed Price Contract Amount may include those listed in subparagraph 16.3.4;

.3 The amount allowed for overhead and profit on any Change Order is limited to the amounts indicated in subparagraph 16.3.11;

.4 Any Change Order prepared, including those arising by reason of the parties’ mutual agreement or by mediation, shall constitute a final and full settlement of all matters relating to or affected by the change in the Work, including all direct, indirect and consequential costs associated with such change and any and all adjustments to the Fixed Price Contract Amount and Contract Time. In the event a Change Order increases the Fixed Price Contract Amount, the Contractor shall include the Work covered by such Change Order in the Contractor’s Request for Payment as if such Work were originally part of the Project and Contract Documents; and

.5 By the execution of a Change Order, the Contractor agrees and acknowledges that it has had sufficient time and opportunity to examine the change in Work which is the subject of the Change Order and that it has undertaken all reasonable efforts to discover and disclose any concealed or unknown conditions which may to any extent affect the Contractor’s ability to perform in accordance with the Change Order. Aside from those matters specifically set forth in the Change Order, the Owner shall not be
obligated to make any adjustments to either the Fixed Price Contract Amount or Contract Time by reason of any conditions affecting the change in Work addressed by the Change Order, which could have reasonably been discovered or disclosed by the Contractor’s examination.

16.3 Construction Change Directive (CCD)

.1 A “Construction Change Directive” is a written order prepared by the Design Professional and signed by the Owner and Design Professional directing a change in the Work prior to agreement on adjustment, if any, in the Fixed Price Contract Amount or Contract Time or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract, consisting of additions, deletions or other revisions, the Fixed Price Contract Amount and Contract Time being adjusted accordingly;

.2 A Construction Change Directive, within limitations, may also be used to incorporate minor changes in the Work agreed to by the Design Professional’s representative, the Owner’s Field Representative and the Contractor’s superintendent or project manager. The limits of these representatives’ authority with regard to Construction Change Directives shall be documented in writing by the Design Professional, Owner and Contractor;

.3 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order;

.4 If the Construction Change Directive provides for an adjustment to the Fixed Price Contract Amount, the adjustment shall be based on one (1) of the following methods:

.1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;

.2 Unit prices stated in the Contract Documents or subsequently agreed upon;

.3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or

.4 As provided in subparagraph 16.3.7;

.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Design Professional in writing within forty-eight (48) hours of the Contractor’s agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Fixed Price Contract Amount or Contract Time;

.6 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor therewith, including adjustment in Fixed Price Contract Amount and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be incorporated into a future Change Order;
.7 If the Contractor does not respond promptly or disagrees with the method for adjustments in the Fixed Price Contract Amount or Contract Time, the method and the adjustment shall be determined by the Design Professional on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Fixed Price Contract Amount, an allowance for overhead and profit in accordance with subparagraph 16.3.11. In such case of an increase in Fixed Price Contract Amount, and also under subparagraph 16.3.4, the Contractor shall keep and present, in such form as the Design Professional may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this subsection shall be limited to the following:

.1 Costs of labor, including social security, old age and unemployment insurance, fringe benefits required by agreement or custom and workers' compensation insurance;

.2 Costs of materials, supplies and equipment, including cost of transportation, whether incorporated or consumed;

.3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;

.4 Costs of permit fees and sales, use or similar taxes related to the Work; and

.5 Additional costs of supervision and field office personnel directly attributable to the change;

.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which results in a net decrease in the Fixed Price Contract Amount shall be for the actual net cost of the decrease, confirmed by the Design Professional. 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;

.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in the Contractor's Request for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs;

.10 When the Owner and Contractor agree with the determination by the Design Professional concerning the adjustments in the Fixed Price Contract Amount and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order; and

.11 For purposes of subparagraphs 16.2.3 and 16.3.7, the allowance for combined overhead, profit, bonds and insurance shall be limited as follows, unless otherwise provided in the Contract Documents:
.1 For changes, the amount allowed for overhead, profit, bonds and insurance for the Contractor and all subcontractors of any tier combined shall not exceed fifteen percent (15%) of direct costs; or

.2 The Contractor will determine the apportionment between the Contractor and its subcontractors of allowable amounts of overhead, profit, bonds and insurance.

16.4 The Design Professional will have authority to order minor changes in the Work not involving adjustment in the Fixed Price Contract Amount or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 17
DISCOVERING AND CORRECTING DEFECTIVE OR INCOMPLETE WORK

17.1 If the Contractor covers, conceals or obscures its Work in violation of this Contract or in violation of a directive or request from the Owner or the Design Professional, such Work shall be uncovered and displayed for the Owner's or Design Professional's inspection upon request and shall be reworked at no cost in time or money to the Owner.

17.2 If any of the Work is covered, concealed or obscured in a manner not addressed by Paragraph 17.1, it shall, if directed by the Owner or the Design Professional, be uncovered and displayed for the Owner's or Design Professional's inspection. If the uncovered Work conforms strictly with this Contract, the costs incurred by the Contractor to uncover and subsequently replace such Work shall be borne by the Owner. Otherwise, such costs shall be borne by the Contractor.

17.3 The Contractor shall, at no cost in time or money to the Owner, promptly correct Work (fabricated, installed or completed) rejected by the Owner or by the Design Professional as defective or that fails to conform to this Contract whether discovered before or after Substantial Completion. Additionally, the Contractor shall reimburse the Owner for all testing, inspections and other expenses incurred as a result thereof.

17.4 In addition to any other warranty obligations in this Contract, the Contractor shall be specifically obligated to correct, upon written direction from the Owner, any and all defective or nonconforming Work for a period of twelve (12) months following Substantial Completion.

17.5 The Owner may, but shall in no event be required to, choose to accept defective or nonconforming Work. In such event, the Fixed Price Contract Amount shall be reduced by the lesser of: (i) the reasonable costs of removing and correcting the defective or nonconforming Work; or (ii) the difference between the fair market value of the Project as constructed and the fair market value of the Project had it not been constructed in such a manner as to include defective or nonconforming Work. If the remaining portion of the unpaid Fixed Price Contract Amount, if any, is insufficient to compensate the Owner for the acceptance of defective or nonconforming Work, the Contractor shall, upon written demand from the Owner, pay the Owner such remaining compensation for accepting defective or nonconforming work.
ARTICLE 18
TERMINATION BY THE CONTRACTOR

18.1 The Contractor may terminate the Contract if the Work is stopped for a period of ninety (90) consecutive days through no act or fault of the Contractor or a subcontractor, sub-
subcontractor or their agents or employees or any other persons or entities performing portions
of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

.1 Issuance of an order by a court or by another public authority having jurisdiction
and authority which requires all Work to be stopped; or

.2 An act of government, such as a declaration of national emergency, which
requires all Work to be stopped.

18.2 In such event, the Contractor shall be entitled to recover from the Owner as though the
Owner had terminated the Contractor's performance under this Contract pursuant to Paragraph
20.3.

ARTICLE 19
OWNER'S RIGHT TO SUSPEND CONTRACTOR'S PERFORMANCE

19.1 The Owner may, at any time and without cause, order the Contractor, in writing, to
suspend, delay or interrupt the Work in whole or in part for such period of time as the Owner
may determine. If the Owner directs any such suspension, the Contractor must immediately
comply with same.

19.2 In the event the Owner directs a suspension of performance under this Article, and such
suspension is through no fault of the Contractor, the Fixed Price Contract Amount and Contract
Time shall be adjusted for increases in the cost and time caused by such suspension, delay or
interruption to cover the Contractor's reasonable costs, actually incurred and paid, of:

.1 Demobilization and remobilization, including such costs paid to subcontractors;

.2 Preserving and protecting Work in place;

.3 Storage of materials or equipment purchased for the Project, including insurance
thereon; and

.4 Performing in a later, or during a longer, time frame than that provided by this
Contract.

19.3 The adjustment of the Fixed Price Contract Amount shall include an amount for a
reasonable profit. The adjustment of the Fixed Price Contract Amount shall not include any
amount not otherwise allowed under this Contract, including any limitations applicable to
Claims. The Contractor shall provide supporting documentation related to any increase upon
request of the Owner. No adjustment shall be made to the extent:

.1 That performance is, was or would have been so suspended, delayed or
interrupted by another cause for which the Contractor is responsible; or
That an equitable adjustment is made or denied under another provision of the Contract.

ARTICLE 20
TERMINATION BY THE OWNER

The Owner may terminate this Contract in accordance with the following terms and conditions:

20.1 If the Contractor does not perform the Work, or any part thereof, in accordance with the Contract Documents, or in a timely manner; does not supply adequate labor, supervisory personnel, or proper equipment or materials; fails to pay subcontractors; fails to timely discharge its obligations for labor, equipment, and materials; proceeds to disobey applicable law; or otherwise breaches this Contract, then the Owner, in addition to any other rights it may have against the Contractor, may terminate the Contract and assume control of the Project site and of all materials and equipment at the site and may complete the Work. In such case, the Contractor shall not be paid further until the Work is complete. Upon such Termination, the Owner may, subject to any superior rights of the Surety, take possession of the site and of all materials, equipment, tools and construction equipment and machinery thereon owned by the Contractor; accept assignment of those subcontracts conditionally assigned under Paragraph 15.2; and finish the Work by whatever reasonable method the Owner may deem expedient.

20.2 When the Owner terminates the Contract for cause as provided in Paragraph 20.1, the Contractor shall not be entitled to receive further payment until the Work is finished and shall only be entitled to payment for Work satisfactorily performed by the Contractor in accordance with the Contract Documents. If the costs of finishing the Work, including compensation for the Design Professional's services and expenses made necessary thereby, exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. In the event the employment of the Contractor is terminated by the Owner for cause pursuant to Paragraph 20.1 and it is subsequently determined by a court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination under Paragraph 20.3 and the provisions of Paragraph 20.3 shall apply.

20.3 The Owner may, at any time and for any reason, terminate this Contract. The Owner shall give no less than seven (7) days' written notice of such Termination to the Contractor specifying when termination becomes effective. The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such Termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The Owner may direct the Contractor to assign the Contractor's right, title and interest under termination orders or subcontracts to the Owner or its designee. The Contractor shall transfer title and deliver to the Owner such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights as the Contractor has. When terminated pursuant to this section, the following shall apply:
.1 The Contractor shall submit a Termination Claim to the Owner and the Design Professional specifying the amounts claimed due because of the Termination, together with costs, pricing or other supporting data required by the Owner or the Design Professional. Failure by the Contractor to file a Termination Claim within ninety (90) days from the effective date of termination shall be deemed a complete waiver by the Contractor of any right to any payment;

.2 Before or after receipt of the Termination Claim, the Owner and the Contractor may agree to the compensation, if any, due to the Contractor hereunder; and

.3 If the Contractor has filed the Termination Claim but the Contractor and the Owner do not agree on an amount due to the Contractor, the Owner shall pay the Contractor the following amounts:

.1 Unpaid Contract prices for labor, materials, equipment and other services provided or perfected prior to termination and acceptable to or accepted by the Owner;

.2 Reasonable costs incurred in preparing to perform the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for direct job-site overhead and profit related to such preparation (such profit shall not include anticipated profit or consequential damages); provided, however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated loss, if any; and

.3 Reasonable costs of settling and paying claims arising out of the Termination of subcontracts or orders pursuant to this Paragraph 20.3.

20.4 Costs described in subparagraphs 20.3.3.2 or 20.3.3.3 above shall not include amounts paid in accordance with other provisions hereof. In no event shall the total sum to be paid the Contractor under subparagraph 20.3.3 exceed the total Fixed Price Contract Amount, as properly adjusted, reduced by the amount of payments previously or otherwise made and by any other deductions permitted under this Contract and shall in no event include duplication of payment.

ARTICLE 21
CONTRACTOR'S LIABILITY INSURANCE

21.1 The Contractor, subcontractor and sub-subcontractor shall purchase and maintain in full force and effect from a company or companies lawfully authorized to do business in the State of Idaho such insurance as will protect the Contractor, subcontractor and sub-subcontractor from claims set forth below which may arise out of or result from the Contractor's or subcontractor's operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable:

.1 Claims under workers' or workmen's compensation, disability benefits and other similar employee benefit acts which are applicable to the work to be performed;
21.2 The insurance required by Paragraph 21.1 above shall be written for not less than limits of liability specified in this Contract or as required by law, whichever is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment. In addition, for any insurance required that is obtained on a claims-made basis, “tail coverage” is required at the completion of the Work for twenty-four (24) months. Continuous claims-made coverage will be acceptable in lieu of “tail coverage” provided the retroactive date is on or before the effective date of this Contract or twenty-four (24) months “prior acts” coverage is provided.

.1 The insurance required by Paragraph 21.1 above shall be written for not less than the following limits:

.1 Workers’ Compensation and Employer’s Liability
   (a) State Workers Compensation: Statutory
   (b) Employer’s Liability:
       $100,000 per Accident
       $500,000 Disease, Policy Limit
       $100,000 Disease, Each Employee

.2 Comprehensive Commercial General Liability and Umbrella Liability Insurance. Contractor shall maintain Commercial General Liability (“CGL”) and, if necessary, commercial umbrella insurance with a limit of not less than $1,000,000 each occurrence. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project location;
CGL insurance shall be written on Insurance Services Office ("ISO") occurrence form CG 00 01 12 04 (or a substitute form providing equivalent coverage) and shall cover liability arising from premises, operation, independent contractors, products-completed operations, personal (including employee acts) and advertising injury and liability assumed under an insured contract (including the tort liability of another assumed in a business contract). As applicable, coverage must also include a broad form CGL endorsement if the substitute insurance is a 1973 edition CGL or its equivalent;

Owner shall be included as an additional insured under the CGL, using ISO additional insured endorsement CG 20 10 and CG 20 37 or their equivalent, which endorsement shall include coverage for the Owner with respect to liability arising out of the Work, including completed operations of Contractor, and which coverage shall be maintained in effect for the benefit of Owner for a period of two (2) years following the completion of the work specified in this Contract. Additional insured coverage as required in this subparagraph shall apply as primary insurance with respect to any other insurance or self-insurance programs afforded to the Owner;

(a) For the hazards of explosion, collapse, and damage to underground property, commonly referred to as XCU, coverage shall be required if the exposures exist; and

This coverage may be provided by the subcontractor if the Owner and prime Contractor are named as additional insureds;

.3 Business Auto and Umbrella Liability Insurance: Contractor shall maintain business, auto liability and, if necessary, commercial umbrella liability insurance with a limit of not less than $1,000,000 each accident;

Such insurance shall cover liability arising out of any auto (including owned, hired, and non-owned autos);

Business auto coverage shall be written on ISO form CA 00 01, CA 00 05, CA 00 12, CA 00 20 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in the 1990 and later editions of CA 00 01;

If hazardous waste will be hauled, Contractor shall obtain pollution liability coverage equivalent to that provided under the ISO pollution liability-broadened coverage for covered autos endorsement (CA 99 48) and the Motor Carrier Act endorsement (MCS 90) shall be attached;

.4 If the General Liability coverages are provided by Commercial Liability policies the:

.1 General Aggregate shall be not less than $2,000,000; and

.2 Fire legal liability shall be provided in an amount not less than $100,000 per occurrence; and
.5 Umbrella Excess Liability. An umbrella policy may be used in combination with other policies to provide the required coverage.

21.4 The Contractor may include all subcontractors as insureds under the Contractor's policies in lieu of separate policies by each subcontractor. The Contractor must furnish the State of Idaho, Division of Public Works, with the required endorsements or certificates of insurance from each subcontractor which names the subcontractor, its officials, employees and volunteers as insureds.

21.5 Certificates of Insurance for Workers' Compensation shall be on the standard form. Certificates of Insurance for Commercial or Comprehensive General Liability shall be the most current ACORD Form 25 or 28, must be acceptable to the Owner and shall be filed with the Owner prior to commencement of the Work. The Owner may require proof of coverage by an endorsement. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Contractor’s Request for Payment as required by Article 7. Information concerning reduction of coverage shall be furnished by the Contractor with reasonable promptness in accordance with the Contractor's information and belief.

ARTICLE 22
OWNER'S LIABILITY INSURANCE

The Owner, at its option, may purchase or maintain insurance for protection against claims which may arise from operations under the Contract.

ARTICLE 23
PROPERTY INSURANCE

23.1 Unless otherwise provided, the Owner shall purchase or maintain, from a company or companies lawfully authorized to do business in the State of Idaho, property insurance written on a builders risk "all-risk" or equivalent policy form in an amount not less than the initial Fixed Price Contract Amount. Such property insurance shall be maintained until final payment to the Contractor has been made. This insurance shall include interests of the Owner, the Contractor, subcontractors and sub-subcontractors.

23.2 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, but not necessarily be limited to insurance against the perils of fire (with extended coverage) and mischief, collapse, earthquake, flood, windstorm, temporary buildings and debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and shall cover necessary and reasonable expenses for the Design Professional's expenses required as a result of such insured loss.

23.3 If the property insurance requires deductibles, the Owner shall pay costs of such deductibles.

23.4 Boiler and Machinery Insurance. The Owner will purchase and maintain boiler and machinery insurance, which shall specifically cover such insured objects during installation and testing.
23.5 Loss of Use Insurance. The Owner, at the Owner’s option, may purchase and maintain such insurance as will insure the Owner against loss of the Owner’s property due to fire or other hazards, however caused.

23.6 Waivers of Subrogation. The Owner and Contractor waive all rights against: (i) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other; and (ii) the Design Professional, Design Professional’s consultants, separate contractors, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages to the Work caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Article or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner. The Owner or Contractor, as appropriate, shall require of the Design Professional, Design Professional’s consultants, separate contractors, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement. A waiver of subrogation shall be effective as 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. The Owner does not waive its subrogation rights to the extent of its property insurance on structures or portions of structures that do not comprise the Work.

23.7 The Contractor authorizes the Owner to negotiate and agree on the value and extent of, and to collect the proceeds payable with respect to, any loss under a policy of insurance carried by the Owner pursuant to any of the provisions of this Article. The Owner shall have full right and authority to compromise any claim, or to enforce any claim by legal action or otherwise, or to release and discharge any insurer, by and on behalf of the Owner and Contractor. The Owner shall provide written notice to Contractor of: (i) its having reached any such settlement or adjustment with an insurer; and (ii) the receipt of any funds pursuant to this Article. Any objection by the Contractor to a settlement or adjustment made under this Article must be made in writing to the Owner within five (5) business days of the notice from the Owner. The Owner and the Contractor agree to attempt to resolve the dispute by mutual agreement.

23.8 A loss under the Owner’s property insurance shall be adjusted by the Owner and made payable to the Owner for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause.

23.9 The Owner shall deposit proceeds so received, in a manner in which such proceeds can be separately accounted for, which proceeds the Owner shall distribute in accordance with such agreement as the parties in interest may reach. If after such loss no other special agreement is made and unless the Owner terminates the Contract pursuant to Article 20, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 16.

23.10 The Contractor shall pay subcontractors their shares of the insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require subcontractors to acknowledge the Owner’s authority under this Article 23 and make payments to their sub-subcontractors in similar manner.
23.11 Nothing contained in this Article 23 shall preclude the Contractor from obtaining, solely at its own expense, additional insurance not otherwise required.

ARTICLE 24
PERFORMANCE AND PAYMENT BONDS

24.1 The Contractor shall furnish separate performance and payment bonds to the Owner. Each bond shall set forth a penal sum in an amount not less than the Fixed Price Contract Amount and shall include a power of attorney attached to each bond. The signature of both the Contractor (principal) and the Surety are required. If the Surety is incorporated, both bonds must have the corporate seal. Each bond furnished by the Contractor shall incorporate by reference the terms of this Contract as fully as though they were set forth verbatim in such bonds. In the event the Fixed Price Contract Amount is adjusted by Change Order executed by the Contractor, the penal sum of both the performance bond and the payment bond shall be deemed increased by like amount. The performance and payment bonds furnished by the Contractor shall be AIA Document A312, or a standard surety form certified approved to be the same as the AIA Document A312, and shall be executed by a Surety, or Sureties, reasonably acceptable to the Owner and authorized to do business in the State of Idaho.

24.2 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall permit a copy to be made.

24.3 It is the Contractor’s obligation to notify the Surety in the event of changes in the Contract Documents, which in the absence of notification might serve to discharge the Surety’s obligations, duties or liability under bonds or the Contract.

ARTICLE 25
PROJECT RECORDS

25.1 All documents relating in any manner whatsoever to the Project, or any designated portion thereof, which are in the possession of the Contractor or any subcontractor of the Contractor, shall be made available to the Owner or the Design Professional for inspection and copying upon written request. Furthermore, said documents shall be made available, upon request by the Owner, to any state, federal or other regulatory authority and any such authority may review, inspect and copy such records. Said records include all drawings, plans, specifications, submittals, correspondence, minutes, memoranda, tape recordings, videos or other writings or things which document the Project, its design and its construction. Said records expressly include those documents reflecting the cost of construction to the Contractor. The Contractor shall maintain and protect these documents for no less than four (4) years after final completion or termination of the Contract or for any longer period of time as may be required by law or good construction practice.
ARTICLE 26
MISCELLANEOUS PROVISIONS

26.1 The law is hereby agreed to be the law of the State of Idaho. The parties further agree that venue for any proceeding related to this Contract shall be in Boise, Ada County, Idaho, unless otherwise mutually agreed by the parties.

26.2 Pursuant to Section 54-1904A, Idaho Code, within thirty (30) days after award of this Contract, the Contractor shall file with the Idaho State Tax Commission, with a copy to the Owner, a signed statement showing the date of Contract award, the names and addresses of the home offices of contracting parties, including all subcontractors, the state of incorporation, the Project Number and a general description of the type and location of the Work, the amount of the prime contracts and all subcontracts and all other relevant information which may be required on forms which may be prescribed by the Idaho State Tax Commission.

26.3 The Contractor, in consideration of securing the business of erecting or constructing public works in the State of Idaho, recognizing that the business in which it is engaged is of a transitory character, and that in the pursuit thereof, its property used therein may be without the state when taxes, excises or license fees to which it is liable become payable, agrees:

.1 To pay promptly when due all taxes (other than on real property), excises and license fees due to the State of Idaho, its sub-divisions, and municipal and quasi-municipal corporations therein, accrued or accruing during the term of this Contract, whether or not the same shall be payable at the end of such term;

.2 That if the said taxes, excises and license fees are not payable at the end of said term, but liability for the payment thereof exists even though the same constitute liens upon its property, to secure the same to the satisfaction of the respective officers charged with the collection thereof; and

.3 That, in the event of its default in the payment or securing of such taxes, excises and license fees, to consent that the department, officer, board or taxing unit entering into this Contract may withhold from any payment due it hereunder the estimated amount of such accrued and accruing taxes, excises and license fees for the benefit of all taxing units to which said Contractor is liable.

26.4 Before entering into a Contract, the Contractor shall be authorized to do business in the State of Idaho and shall submit a properly executed Contractor’s Affidavit Concerning Taxes (Exhibit D).

26.5 Pursuant to Section 44-1002, Idaho Code, it is provided that each Contractor "must employ ninety-five percent (95%) bona fide Idaho residents as employees on any job under any such contract except where under such contracts fifty (50) or less persons are employed the contractor may employ ten percent (10%) nonresidents, provided, however, in all cases employers must give preference to the employment of bona fide residents in the performance of said work, and no contract shall be let to any person, firm, association, or corporation refusing to execute an agreement with the above mentioned provisions in it; provided, that, in contracts involving the expenditure of federal aid funds this act shall not be enforced in such a manner as to conflict with or be contrary to the federal statutes prescribing a labor preference to honorably
discharged soldiers, sailors, and marines, prohibiting as unlawful any other preference or discrimination among citizens of the United States." (Ref. Section 44-1001, Idaho Code)

26.6 The Contractor shall maintain, in compliance with Title 72, Chapter 17, Idaho Code, a drug-free workplace program throughout the duration of this Contract and shall only subcontract work to subcontractors who have programs that comply with Title 72, Chapter 17, Idaho Code.

26.7 As between the Owner and Contractor as to acts or failures to act, any applicable statute of limitations shall commence to run and any legal cause of action shall be deemed to have accrued in any and all events in accordance with Idaho law.

26.8 The Contractor and its subcontractors and sub-subcontractors shall comply with all applicable Idaho statutes with specific reference to Idaho Public Works Contractors' licensing laws in the State of Idaho, Title 54, Chapter 19, Idaho Code, as amended.

26.9 The Contractor shall not knowingly hire or engage any illegal aliens or persons not authorized to work in the United States and take steps to verify that it does not hire or engage any illegal aliens or persons not authorized to work in the United States. Any misrepresentation in this regard or any employment of persons not authorized to work in the United States constitutes a material breach and shall be cause for the imposition of monetary penalties not to exceed five percent (5%) of the Fixed Price Contract Amount per violation and/or Termination of this Contract. The Contractor also acknowledges that, if it is a natural person, it is subject to Title 67, Chapter 79, Idaho Code regarding verification of lawful presence in the United States.

ARTICLE 27
EQUAL OPPORTUNITY

The Contractor shall maintain policies of employment as follows:

27.1 The Contractor and the Contractor's subcontractors shall not discriminate against any employee or applicant for employment because of race, religion, color, sex, age or national origin. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, color, sex, age or national origin. Such action shall include the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

27.2 The Contractor and the Contractor's subcontractors shall, in all solicitation or advertisements for employees placed by them or on their behalf; state that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, age or national origin.

ARTICLE 28
SUCCESSORS AND ASSIGNS

28.1 Each party binds itself, its successors, assigns, executors, administrators or other representatives to the other party hereto and to successors, assigns, executors, administrators
or other representatives of such other party in connection with all terms and conditions of this Contract. The Contractor shall not assign this Contract or any part of it or right or obligation pursuant to it without prior written consent of the Owner. If Contractor attempts to make assignment without consent of Owner, Contractor shall remain legally responsible for all obligations under this Contract.

**ARTICLE 29**

**SEVERABILITY**

29.1 In the event any provision or section of this Contract conflicts with applicable law or is otherwise held to be unenforceable, the remaining provisions shall nevertheless be enforceable and shall be carried into effect.

**ARTICLE 30**

**MEDIATION**

30.1 Contractor Claims for additional cost or time are subject to Article 13, shall be reviewed as provided in accordance with that Article and, as a condition precedent to litigation, are subject to dispute resolution attempts and mediation in accordance with this Article. All other issues and disputes arising from this contract are also subject to dispute resolution attempts & mediation in accordance with this Article, as a condition precedent to litigation.

30.2 The parties agree that resolution of any dispute or disagreement without formal legal proceedings is to their mutual benefit and to the benefit of the Project.

30.3 The parties agree to make every reasonable attempt to resolve any issues or disputes informally. The parties further agree that prior to the institution by either of legal or equitable proceedings of any kind, and as a condition precedent thereto, any dispute between the Contractor and the Owner related to the Contract, including a dispute over the Owner’s decision regarding a Claim, shall be subject to mediation as follows:

.1 If the issue to be mediated involves only a dispute regarding the Contract Time, no request to mediate shall be made unless liquidated damages have been assessed by the Owner. If the issue to be mediated involves a Claim or other financial dispute, no request to mediate shall be made unless the amount is $50,000 or more or until there are cumulative Claims or disputes amounting to $50,000 or more; provided, however, that a mediation request can be made as to any Claim or financial matter at any time after Substantial Completion;

.2 The party seeking mediation shall notify the other party in writing of its mediation request. In such written request, the requesting party must clearly describe the issues it believes are subject to mediation;

.3 Within fifteen (15) days of receipt of the mediation request, the non-requesting party shall respond in writing to the request;

.4 Unless the Owner and the Contractor agree to other rules for mediation, mediation shall be in accordance with the Construction Industry Rules of Arbitration and Mediation Procedures in effect at the time of the mediation;
.5 The parties shall share the mediator’s fee and any filing fees equally; provided, however, that if a party makes a written request to the mediator without satisfying the requirements of this section and by doing so incurs any costs or fees, that party shall be solely responsible for the costs or fees;

.6 Unless otherwise mutually agreed to by the parties, the mediation shall be in Boise, Ada County, Idaho;

.7 The parties shall cooperate in arranging the other details of mediation, such as selection of the mediator, mediation dates and times;

.8 The parties agree that all parties necessary to resolve the matter shall be parties to the same mediation proceeding; provided, however, that no subcontractor or sub-subcontractor shall attend the mediation absent advance notice and consent from the Owner;

.9 Agreements reached in mediation shall be enforceable as settlement agreements in any court having proper jurisdiction; and

.10 Unless otherwise agreed in writing, the Contractor shall continue the Work and maintain the approved schedules during any mediation proceedings. If the Contractor continues to perform, the Owner shall continue to make payments in accordance with the Contract Documents.

30.4 If mediation fails to resolve the dispute, either party may file an action in the courts of Idaho in accordance with the venue provision contained in this Contract.

ARTICLE 31
WAIVER OF CONSEQUENTIAL DAMAGES

31.1 The Contractor and Owner waive claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes:

.1 Damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation and for loss of management or employee productivity or of the services of such persons.

.2 Damages incurred by the Contractor for principal office expenses, including the compensation of personnel stationed there; for losses of income, financing, business and reputation; loss of management or employee productivity or of the services of such persons; and for loss of profit except profit arising directly from the Work.
31.2 This mutual waiver is applicable, without limitation, to all consequential damages due to either party’s termination in accordance with Articles 18 and 20. Nothing contained in this paragraph shall be deemed to preclude an award of the assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

IN WITNESS WHEREOF, the parties have executed this Contract on the dates set forth below.

OWNER

State of Idaho
Idaho Transportation Department

By: ____________________________
Date Executed
Ruth Munoz, Facilities Management
Contracting Officer

CONTRACTOR

Contractor’s Name- Typed

By: ____________________________
Date Executed
Signature

Printed Name

Title
EXHIBIT A

OWNER’S PROJECT IDENTIFICATION INFORMATION:

Materials Training Lab Renovation
ITD Project No. FM32004
8150 Chinden Blvd
Boise, Idaho 83714

General Project Description:

Conversion of an existing building, originally constructed as a vehicle service and fueling station, into a materials testing lab.

ADDENDA: Addenda applicable to the Contract and made a part of are as follows:

Addendum No. _____ Dated ____________
Addendum No. _____ Dated ____________
Addendum No. _____ Dated ____________

FIXED PRICE CONTRACT AMOUNT AND ACCEPTED ALTERNATES:

Base Bid Amount: $0.00
Alternate No. __ (______________________________) add $0.00
Alternate No. __ (______________________________) add $0.00
Alternate No. __ (______________________________) add $0.00
Total Fixed Price Contract Amount (______________________________) Dollars $0.00

Contractor’s Requests for Payment are to be submitted for Work accomplished through the ______ day of each month as described in Paragraph 7.3.

TIME FOR PERFORMANCE AND LIQUIDATED DAMAGES:

A. The Contractor shall commence construction of its scope of the Work in accordance with the Notice to Proceed issued by the Owner and which will become Exhibit F to this Contract.

B. The Contractor shall accomplish Substantial Completion as defined in Article 6 of the Contract within (90) consecutive calendar days from the date authorized to proceed in the Notice to Proceed.

C. The amount of liquidated damages per day for each and every day of unexcused delay as outlined in Article 6 on the Contract is: Five Hundred Dollars ($500.00)

DRAWINGS AND SPECIFICATIONS

The Owner shall furnish the Contractor 1 set of Drawings and Project Manuals
SPECIAL CONDITIONS

A. In Article 21, Paragraph 21.3, add the Idaho State Building Authority to be named as an additional insured.

B. In Article 21, Paragraph 21.5, also provide a separate certificate issued to the Idaho State Building Authority showing the Idaho State Building Authority as an additional insured.
EXHIBIT B

ADDRESSES and AUTHORIZED REPRESENTATIVES: The names, addresses and authorized representatives of the Owner, the Contractor and the Design Professional are:

OWNER

Owner: Idaho Transportation Department
Tony Pirc, Facilities Manager
3311 W State St
Boise, Idaho, 83703
208-334-8600
tony.pirc@itd.idaho.gov

Contracting Officer: Idaho Transportation Department
Ruth Munoz, Facilities Management Contracting Officer
3311 W State St
Boise, Idaho, 83703
208-334-8606
ruth.munoz@itd.idaho.gov
May sign for Owner: Yes [ X ] No [    ]

Field Representative: Idaho Transportation Department
John Hall, TSEA
8150 Chinden Blvd
Boise, Idaho 83714
208-334-8307
john.hall@itd.idaho.gov
May sign for Owner: Yes [    ] No [ X ]
CONTRACTOR

Contractor: ____________________________________________ (company name)
____________________________________________________ (address)
____________________________________________________ (city, state, zip)
____________________________________________________ (telephone and FAX)
Public Works Contractors License No. __________________________

Officer: ____________________________________________ (name and title)
____________________________________________________ (telephone)
____________________________________________________ (E-mail)

Contractor's Project Manager:
__________________________________________ (name)
____________________________________________________ (telephone and FAX)
____________________________________________________ (E-mail)
May sign for Contractor: Yes [ ] No [ ]
Change Orders: up to: $______.00
Construction Change Authorizations: up to: $______.00
Contractor's Request for Payment

Contractor's Superintendent:
__________________________________________ (name)
____________________________________________________ (telephone and FAX)
____________________________________________________ (E-mail)
May sign for Contractor: Yes [ ] No [ ]
Construction Change Authorizations: up to $______.00
DESIGN PROFESSIONAL

Design Professional:
CSHQ (firm name)
200 Broad St (address)
Boise, Idaho 83702 (city, state and zip)
208-343-4635 (telephone)
208-343-1858 (FAX)

Professional's Project Manager:
Craig Slocum (name)
Professional License No. AR-2010
208-429-4016 (telephone)
208-343-1858 (FAX)
Craig.slocum@cshqa.com (E-mail)

Professional's Field Representative:
Loren Broyles (name)
208-429-4046 (telephone)
208-343-1858 (FAX)
Loren.broyles@cshqa.com (E-mail)

May sign for Design Professional:
Field Reports Yes [X] No [ ]
Change Order Proposal Requests Yes [X] No [ ]
Construction Change Authorization: Yes [X] No [ ]
Construction Change Order Yes [X] No [ ]
Design Professional's Supplemental Instructions Yes [X] No [ ]
Interpretations of the Contract Documents Yes [X] No [ ]
Contractor's Request for Payment Yes [X] No [ ]
Acceptance of Substantial Completion Yes [X] No [ ]
Acceptance of final completion Yes [X] No [ ]
EXHIBIT C

SECTION 000115
LIST OF DRAWING SHEETS

GENERAL
G01 - TITLE SHEET
G10 - CODE PLAN

ARCHITECTURAL
A11 - DEMOLITION PLANS
A21 - FLOOR PLAN
A31 - REFLECTED CEILING PLAN
A41 - ENLARGED RESTROOM PLAN
A51 - EXTERIOR ELECATIONS AND ROOF PLAN
A71 - DOOR AND WINDOW SCHEDULES
A81 - DETAILS

PLUMBING
P01 - COVER SHEET
P11 - PLUMBING DEMO - LEVEL 1
P21 - WASTE AND VENT PLAN - LEVEL 1
P22 - WASTE AND VENT PLAN - LEVEL 2
P23 - WATER AND GAS PLAN - LEVEL 1
P24 - WATER AND GAS PLAN - LEVEL 2
P41 - PLUMBING SCHEDULES
P42 - PLUMBING DETAILS

MECHANICAL
M01 - MECHANICAL COVER SHEET
M02 - ENERGY COMPLIANCE
M03 - ENERGY COMPLIANCE AND INSULATION SCHEDULES
M11 - HVAC DEMO PLAN
M21 - HVAC PLAN - LEVEL 1
M22 - HVAC PLAN - LEVEL 2
M41 - MECHANICAL SCHEDULES
M51 - HVAC DETAILS
M52 - HVAC DETAILS AND MECHINICAL SCHEDULES

ELECTRICAL
E01 - GENERAL SYMBOLS AND LEGEND
E02 - LIGHTING COMPLIANCE
E11 - LIGHTING PLANS
E21 - POWER PLANS
E81 - SINGLE-LINE AND PANEL SCHEDULES

TELECOMMUNICATIONS
T01 - TELECOMM. SYMBOLS AND ABBREVIATIONS
T04 - TELECOMM. CABLING SCHEMATICS & LABELING
T21 - TELECOM PLANS
TABLE OF CONTENTS PROCUREMENT AND CONTRACTING REQUIREMENTS

DIVISION 00 -- PROCUREMENT AND CONTRACTING REQUIREMENTS
000103 - Project Directory
000110 - Table of Contents

SPECIFICATIONS
DIVISION 01 -- GENERAL REQUIREMENTS
011000 - Summary
012000 - Price and Payment Procedures
012500 - Substitution Procedures
013000 - Administrative Requirements
014000 - Quality Requirements
014216 - Definitions
015000 - Temporary Facilities and Controls
016000 - Product Requirements
016116 - Volatile Organic Compound (VOC) Content Restrictions
017000 - Execution and Closeout Requirements
017419 - Construction Waste Management and Disposal
017800 - Closeout Submittals
017900 - Demonstration and Training

DIVISION 02 -- EXISTING CONDITIONS
024100 - Demolition

DIVISION 03 -- CONCRETE
030100 - Maintenance of Concrete
030516 - Underslab Vapor Barrier
032000 - Concrete Reinforcing
033000 - Cast-in-Place Concrete
033005 - Water Vapor Reducing Admixture for Cast-in-Place Concrete
033006 - Waterproofing Admixture for Cast-in-Place Concrete
033511 - Concrete Floor Finishes

DIVISION 04 -- MASONRY
042000 - Unit Masonry

DIVISION 05 -- METALS
055000 - Metal Fabrications
055100 - Metal Stairs

DIVISION 06 -- WOOD, PLASTICS, AND COMPOSITES
062000 - Finish Carpentry
064100 - Architectural Wood Casework

DIVISION 07 -- THERMAL AND MOISTURE PROTECTION
072100 - Thermal Insulation
079200 - Joint Sealant
## DIVISION 08 -- OPENINGS
- 081113 - Hollow Metal Doors and Frames
- 081216 - Aluminum Frames (InFrame Interior Framing System)
- 081416 - Flush Wood Doors
- 087100 - Door Hardware
- 088000 - Glazing
- 088300 - Mirrors

## DIVISION 09 -- FINISHES
- 092116 - Gypsum Board Assemblies
- 092216 - Non-Structural Metal Framing
- 095100 - Acoustical Ceilings
- 099113 - Exterior Painting
- 099123 - Interior Painting

## DIVISION 10 -- SPECIALTIES
- 102600 - Wall and Door Protection
- 102800 - Toilet, Bath, and Laundry Accessories

## DIVISION 11 -- EQUIPMENT

## DIVISION 12 -- FURNISHINGS

## DIVISION 13 -- SPECIAL CONSTRUCTION

## DIVISION 14 -- CONVEYING EQUIPMENT

## DIVISION 21 -- FIRE SUPPRESSION

## DIVISION 22 -- PLUMBING
- 220516 - Expansion Fittings and Loops for Plumbing Piping
- 220517 - Sleeves and Sleeve Seals for Plumbing Piping
- 220523 - General-Duty Valves for Plumbing Piping
- 220553 - Identification for Plumbing Piping and Equipment
- 220719 - Plumbing Piping Insulation
- 221005 - Plumbing Piping
- 221006 - Plumbing Piping Specialties
- 223000 - Plumbing Equipment
- 224000 - Plumbing Fixtures

## DIVISION 23 -- HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)
- 230513 - Common Motor Requirements for HVAC Equipment
- 230593 - Testing, Adjusting, and Balancing for HVAC
- 230713 - Duct Insulation
- 233100 - HVAC Ducts and Casings
- 233300 - Air Duct Accessories
- 233416 - Centrifugal HVAC Fans
- 233423 - HVAC Power Ventilators
- 233700 - Air Outlets and Inlets
- 235100 - Breechings, Chimneys, and Stacks
235400 - Furnaces
238126.13 - Small-Capacity Split-System Air Conditioners

DIVISION 25 -- INTEGRATED AUTOMATION

DIVISION 26 -- ELECTRICAL
260505 - Selective Demolition for Electrical
260519 - Low-Voltage Electrical Power Conductors and Cables
260526 - Grounding and Bonding for Electrical Systems
260529 - Hangers and Supports for Electrical Systems
260533.13 - Conduit for Electrical Systems
260533.16 - Boxes for Electrical Systems
260536 - Cable Trays for Electrical Systems
260553 - Identification for Electrical Systems
260583 - Wiring Connections
260923 - Lighting Control Devices
262100 - Low-Voltage Electrical Service Entrance
262416 - Panelboards
262726 - Wiring Devices
262816.16 - Enclosed Switches
264300 - Surge Protective Devices
265100 - Interior Lighting
265600 - Exterior Lighting

DIVISION 27 -- COMMUNICATIONS
275121 - Biophilic Audio-Visual Environmental Systems

DIVISION 28 -- ELECTRONIC SAFETY AND SECURITY

DIVISION 31 - EARTHWORK

DIVISION 32 -- EXTERIOR IMPROVEMENTS

DIVISION 33 - UTILITIES

DIVISION 46 -- WATER AND WASTEWATER EQUIPMENT

END OF SECTION 000110
EXHIBIT D

CONTRACTOR’S AFFIDAVIT CONCERNING TAXES

STATE OF ___________________)
COUNTY OF ___________________)

Pursuant to the Title 63, Chapter 15, Idaho Code I, the undersigned, being duly sworn, deposite and certify that all taxes, excises and license fees due to the State or its taxing units, for which I or my property is liable then due or delinquent, has been paid, or arrangements have been made, before entering into a Contract for construction of any public works in the State of Idaho.

SEAL

____________________________________________
Name of Contractor

____________________________________________
Address

____________________________________________
City and State

By:

____________________________________________
(Signature)

Subscribed and sworn to before me this _______________ day of __________________, ______.

____________________________________________
NOTARY PUBLIC
Residing at: __________________
Commission expires: __________________
EXHIBIT E

NAMED SUBCONTRACTORS:

Pursuant to Section 67-2310, Idaho Code, commonly known as the naming law, the names and addresses of the entities who will perform the plumbing, heating and air conditioning and electrical work were named in the bid and are as follows:

Plumbing (PWCL Category 15400)
(Name)____________________________________________________________________
(Address)_________________________________________________________________

Idaho Public Works Contractors License No. ________________________________
Idaho Plumbing Contractors License No. ___________________________________

Heating Ventilating & Air Conditioning (PWCL Category 15700-HVAC)
(Name)____________________________________________________________________
(Address)_________________________________________________________________

Idaho Public Works Contractors License No. ________________________________
Idaho HVAC Contractors License No. _______________________________________

Electrical (PWCL Category 1600)
(Name)____________________________________________________________________
(Address)_________________________________________________________________

Idaho Public Works Contractors License No. ________________________________
Idaho Electrical Contractors License No. ___________________________________
EXHIBIT F

DATE

COMPANY NAME
Attn:  NAME
ADDRESS
CITY STATE ZIP

RE:  ITD FM____ - CONTRACT NOTICE TO PROCEED

Dear Mr. ________________________:

Attached is the executed contract, number FM____, between the Idaho Transportation Department and _______________________________ for the ________________ services at our _________________________ location.

Please make contact with ___________________________ to initiate the work as outlined in the attached document. His contact information is:

NAME
EMAIL
208-____-____

We thank you for your interest to work with the Idaho Department of Transportation and hope that you will consider future opportunities.

Please contact me at 208-334-8606 if you have any questions,

Ruth Munoz
Facility Management Contracting Officer
Idaho Transportation Department

Attachment
Idaho State Tax Commission  
REQUEST FOR TAX RELEASE  
Date: ____________________

<table>
<thead>
<tr>
<th>PART I -- AWARDING AGENCY INFORMATION:</th>
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</thead>
<tbody>
<tr>
<td>Name of agency</td>
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<tr>
<td>Contact name</td>
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</table>

<table>
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<tr>
<th>PART II -- CONTRACTOR INFORMATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of contractor</td>
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<tr>
<td>Federal EIN</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>PART III -- CONSTRUCTION/CONTRACT MANAGER INFORMATION (if applicable):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of business</td>
</tr>
<tr>
<td>Federal EIN</td>
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</tbody>
</table>

Send a copy of the approved Tax Release to: Awarding Agency  Contractor  Construction Manager

**NOTE:** We will email all copies unless otherwise requested

<table>
<thead>
<tr>
<th>PART IV -- PROJECT INFORMATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of project</td>
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<tr>
<td>Description of project</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project number assigned by awarding agency</th>
<th>Project start date</th>
<th>Project completion date</th>
<th>Final/closing contract amount (includes all change orders)</th>
</tr>
</thead>
</table>

Did any government entities supply materials which were installed by this contractor or its subs?:

- Yes ____________________________________________  No

If YES, list these materials and their dollar values. (Attach additional information if needed)

List Materials

<table>
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Send to:

- Contract Desk/Sales Tax Audit
NOTE: Please allow 30 days to process a Tax Release Request. You must send a complete, signed Form WH-5 Public Works Contract Report to the Idaho State Tax Commission to complete this request.
EXHIBIT H
RELEASE OF CLAIMS

(TO BE COMPLETED FOR FINAL PAYMENT)

I, ________________________________, do hereby release the State of Idaho from any and all claims of any character whatsoever arising under and by virtue of contract number _______ Dated , as amended, except as herein stated.

Dated ___________________ Contractor _____________________________
EXHIBIT J

Conditions Precedent to Final Payment

Date: ____________________________

ITD Project No. ____________________________
Project Title: ____________________________
Location: ____________________________

Send to: State of Idaho
Idaho Transportation Department
3311 W State St
Boise, Idaho 83703

Copy to: Design Professional

Contractor's Responsibilities:

Per Paragraph 7:13 of the Fixed Price Contract: As a condition precedent to final payment, the Contractor must furnish the owner, in the form and manner required by Owner, to be submitted to the Design Professional for approval, the following:

- Contractor’s Final Request for Payment Form has been provided;
- Release of Claims form has been provided (ITD’s form, Exhibit H);
- Contractor’s Affidavit of Payment of Debts and Claims Form has been provided (AIA G706);
- Consent of Surety to Final Payment has been provided (AIA G707);
- Confirmation of all required training, product warranties, operating manuals, instruction manuals and other record documents, drawings and items customarily required of the Contractor has been provided.
- Public Works Contract Tax Release from the Idaho Tax Commission has been provided;
- ITD’s Letter of Completion/Final Inspection Sign-Off (as required);
- Project Finalization and Start Up has been provided (as required, Exhibit L);

________________________________________________________
Contractor’s Signature Date
Design Professional’s Approval for Payment:

☐ All Documents Required per Paragraph 7.13 of the Fixed Price Contract

☐ All Warranties, Guarantees, etc. have been received, approved and have been provided.

☐ As-Built Drawings have been received, reviewed and approved.

☐ Record Drawings have been completed. All of the required copies of the Record Documents and electronic media are attached and/or uploaded to OMS.

☐ All punch list items have been verified and signed off as complete.

To the best of my knowledge, information, and belief, and on the basis of my observations and inspections, I certify the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the required documentation required by Paragraph 7.13 of the fixed priced contract has been received. The entire balance, as shown on the attached Final Request for Payment, is due and payable.

__________________________________________________________
Design Professional’s Signature                                      Date
Upon completion of the equipment and systems installation and connections, the contractor shall assemble all equipment factory representative and subcontractors together for system start-up.

These people shall assist in start-up and check out their system(s) and remain at the site until the total system operation is acceptable and understood by the agency’s representative(s). The factory representative and system subcontractor shall also give instructions on operation and maintenance of their equipment to the agency’s maintenance and/or operation personnel. To prove acceptance of operation and instruction by the agency’s representative(s), this written statement of acceptance shall be signed below.

“I, the Contractor, associated factory representative and subcontractors, have started each system and the total system; and have proven their normal operation to the agency’s representative(s) and maintenance/operation personnel and have instructed him/them in the operation and maintenance thereof.”

________________________________________  ______________________________________
Agency’s Representative                        Contractor

________________________________________
Signature

________________________________________
Date
END OF GENERAL REQUIREMENTS
SECTION 011000 - SUMMARY

PART 1  GENERAL

1.01  PROJECT
   A. Project Name: ITD (19-307) A&E Services Materials Lab GC
   B. Owner's Name: Idaho Transportation Department.
   C. Architect's Name: CSHQA.
   D. The Project consists of the alteration of Maintenance, shop and office facility.

1.02  CONTRACT DESCRIPTION
   A. Contract Type: Department of Public Works' Construction Contract between Owner and Contractor based on a Fixed price as described in Document 005000 - Contracting Forms and Supplements.

1.03  DESCRIPTION OF ALTERATIONS WORK
   A. Summary of Work:
      The work consists of the conversion of an existing building, originally built as a service and fueling station, into a materials training lab. The enclosed Bid-Package/Bid Forms, in conjunction with the bid plans and specifications, along with the information accessible to the bidders at the scheduled site walk-through, and any subsequent addenda provide the description of work required in the Bid Package.
      The building will be vacated by the Owner during the construction period, however, all consideration will be given to the fact that the Owner will have personnel and vehicles operating on the site during the construction period and all practical measures will be taken to accommodate the owner's presence and activities in a safe manner. The Owner will be responsible for removing, handling and replacing any Owner's equipment, materials, shelving and furniture not specifically noted on the plans as work by the contractor.
      In general, the work includes select architectural demolition, removal of overhead doors, demolition related to the mechanical and electrical trades, concrete work, minor masonry, roof patching, construction of non-loadbearing partition walls, installation of suspended tile ceilings, removal of existing restroom and construction of new restrooms.
      Mechanical work includes demolition of existing and installation of new HVAC system.
      Electrical work includes demolition of existing and installation of new electrical system, including new electrical panels, wiring and lighting throughout the building and equipment hook-ups.
      Asbestos and lead based paint work/abatement required, if any, is not a part of this work.
   B. Scope of demolition and removal work is indicated on drawings and specified in Section 024100.
   C. Scope of alterations work is indicated on drawings.

1.04  OWNER OCCUPANCY
   A. Owner intends to occupy the Project upon Substantial Completion.
   B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
   C. Schedule the Work to accommodate Owner occupancy.

1.05  CONTRACTOR USE OF SITE AND PREMISES
   A. Provide access to and from site as required by law and by Owner:
      1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
      2. Do not obstruct roadways, sidewalks, or other public ways without permit.
   B. Utility Outages and Shutdown:
      1. Prevent accidental disruption of utility services to other facilities.
1.06 SPECIFICATION SECTIONS APPLICABLE TO ALL CONTRACTS

A. Unless otherwise noted, all provisions of the sections listed below apply to all contracts. Specific items of work listed under individual contract descriptions constitute exceptions.

B. Section 012000 - Price and Payment Procedures.

C. Section 012300 - Alternates.

D. Section 013000 - Administrative Requirements.

E. Section 014000 - Quality Requirements.

F. Section 014216 - Definitions.

G. Section 015000 - Temporary Facilities and Controls.

H. Section 016000 - Product Requirements.

I. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

J. Section 017000 - Execution and Closeout Requirements.

K. Section 017800 - Closeout Submittals.

END OF SECTION 011000
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Procedures for preparation and submittal of applications for progress payments.

1.02 RELATED REQUIREMENTS
   A. Section 005000 - Contracting Forms and Supplements: Forms to be used.
   B. Section 005200 - Agreement Form: Contract Sum, retainages, payment period, monetary values of unit prices.
   C. Section 007200 - General Conditions and Document 007300 - Supplementary Conditions: Additional requirements for progress payments, final payment, changes in the Work.
   D. Section 007300 - Supplementary Conditions: Percentage allowances for Contractor's overhead and profit.
   E. Section 012100 - Allowances: Payment procedures relating to allowances.
   F. Section 012200 - Unit Prices: Payment and modification procedures relating to unit prices.
   G. Section 017800 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES
   A. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
   B. Forms filled out by hand will not be accepted.
   C. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS
   A. Payment Period: Submit at intervals stipulated in the Agreement.
   B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
   C. Forms filled out by hand will not be accepted.
   D. Execute certification by signature of authorized officer.
   E. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
   F. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
   G. Submit one electronic and three hard-copies of each Application for Payment.

1.05 APPLICATION FOR FINAL PAYMENT
   A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
   B. Application for Final Payment will not be considered until the following have been accomplished:
      1. All closeout procedures specified in Section 017000.
      2. Completed "Release of Claims" form attached following this page.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 012000
SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS
A. Section 013000 - Administrative Requirements: Submittal procedures, coordination.

1.03 DEFINITIONS
A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS
A. No substitution Requests allowed after bid date except:
   1. When products are unavailable within construction schedule.
B. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
C. A Substitution Request for specified installer constitutes a representation that the submitter:
   1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.
D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
E. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. No specific form is required. Contractor's Substitution Request documentation must include the following:
      a. Project Information:
         1) Official project name and number, and any additional required identifiers established in Contract Documents.
         2) Owner's, Architect's, and Contractor's names.
      b. Substitution Request Information:
         1) Indication of whether the substitution is for cause or convenience.
         2) Issue date.
3) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
4) Description of Substitution.
5) Reason why the specified item cannot be provided.
6) Differences between proposed substitution and specified item.
7) Description of how proposed substitution affects other parts of work.

c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
1) Physical characteristics.
2) In-service performance.
3) Warranties.
4) Include, as appropriate or requested, the following types of documentation:
   (a) Product Data:
   (b) Samples.
   (c) Certificates, test, reports or similar qualification data.
   (d) Drawings, when required to show impact on adjacent construction elements.

d. Impact of Substitution:
1) Savings to Owner for accepting substitution.
2) Change to Contract Time due to accepting substitution.

F. Limit each request to a single proposed substitution item.
   1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT
   A. Owner will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION
   A. Submit request for Substitution for Cause immediately upon discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
   B. Submit request for Substitution for Convenience immediately upon discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
   1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
   2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
   3. Bear the costs engendered by proposed substitution of:
      a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.
   C. Substitutions will not be considered under one or more of the following circumstances:
      1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
      2. Without a separate written request.
      3. When acceptance will require revisions to the Contract Documents.

3.04 RESOLUTION
   A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
   B. Architect will notify Contractor in writing of decision to accept or reject request.
      1. Architect's decision following review of proposed substitution will be noted on the submitted form.
3.05 ACCEPTANCE
   A. Accepted substitutions change the work of the Project. They will be documented and
corporated into work of the project by Change Order, Construction Change Directive,
Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of
the Contract.

3.06 CLOSEOUT ACTIVITIES
   A. See Section 017800 - Closeout Submittals, for closeout submittals.
   B. Include completed Substitution Request Forms as part of the Project record. Include both
approved and rejected Requests.

END OF SECTION 012500
SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preconstruction meeting.
B. Site mobilization meeting.
C. Progress meetings.
D. Construction progress schedule.
E. Contractor's daily reports.
F. Progress photographs.
G. Submittals for review, information, and project closeout.
H. Number of copies of submittals.
I. Requests for Information (RFI) procedures.
J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 007200 - General Conditions: Duties of the Construction Manager.
B. Section 017000 - Execution and Closeout Requirements: Additional coordination requirements.
C. Section 017800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 REFERENCE STANDARDS


1.04 PROJECT COORDINATOR

A. Project Coordinator: Construction Manager.
B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for vehicular access, traffic, and parking facilities.
C. During construction, coordinate use of site and facilities through the Project Coordinator.
D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 011000 - Summary.
F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
G. Make the following types of submittals to Architect through the Project Coordinator:
   1. Requests for Information.
   2. Requests for substitution.
   3. Shop drawings, product data, and samples.
   4. Test and inspection reports.
   5. Design data.
   6. Manufacturer's instructions and field reports.
   7. Applications for payment and change order requests.
   8. Progress schedules.
   9. Coordination drawings.
   10. Correction Punch List and Final Correction Punch List for Substantial Completion.
   11. Closeout submittals.
PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRECONSTRUCTION MEETING

A. Owner will schedule a time, location and date for the meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   3. Contractor.
   4. Sub-contractors.
   5. Agency Representative.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Submission of initial Submittal schedule.
   7. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   8. Scheduling.

D. Architect is to record minutes and distribute copies within two days after meeting to participants, with two copies to Owner, participants, and those affected by decisions made.

3.02 SITE MOBILIZATION MEETING

A. Project Coordinator will schedule meeting at the Project site prior to Contractor occupancy.

B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Special consultants.
   5. Contractor's superintendent.

C. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements.
   3. Construction facilities and controls provided by Owner.
   4. Temporary utilities provided by Owner.
   5. Survey and building layout.
   7. Schedules.
   8. Application for payment procedures.
   9. Procedures for testing.
   11. Requirements for start-up of equipment.
   12. Inspection and acceptance of equipment put into service during construction period.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
B. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Special consultants.
   5. Contractor’s superintendent.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
10. Maintenance of quality and work standards.
11. Effect of proposed changes on progress schedule and coordination.
12. Other business relating to work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE
   A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.
   B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
   C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
      1. Include written certification that major contractors have reviewed and accepted proposed schedule.
   D. Within 10 days after joint review, submit complete schedule.
   E. Submit updated schedule every 30 days.

3.05 DAILY CONSTRUCTION REPORTS
   A. Include only factual information. Do not include personal remarks or opinions regarding operations and/or personnel.
   B. Prepare a daily construction report recording the following information concerning events at Project site and project progress:
      1. Date.
      2. High and low temperatures, and general weather conditions.
      3. Safety, environmental, or industrial relations incidents.
      4. Meetings and significant decisions.
      5. Stoppages, delays, shortages, and losses. Include comparison between scheduled work activities (in Contractor’s most recently updated and published schedule) and actual activities. Explain differences, if any. Note days or periods when no work was in progress and explain the reasons why.
      6. Testing and/or inspections performed.
      7. Signature of Contractor’s authorized representative.

3.06 PROGRESS PHOTOGRAPHS
   A. Submit new photographs at least once a month, within 3 days after being taken.
   B. Photography Type: Digital; electronic files.
C. Provide photographs of construction throughout progress of work produced by an experienced photographer, acceptable to Architect.

D. In addition to periodic, recurring views, take photographs of each of the following events:
   1. Excavations in progress.
   2. Foundations in progress and upon completion.
   3. Structural framing in progress and upon completion.
   4. Final completion, minimum of ten (10) photos.

E. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with Architect for instructions on views required.
   3. Provide factual presentation.
   4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.

3.07 REQUESTS FOR INFORMATION (RFI)
A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of the Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
   2. Prepare in a format and with content acceptable to Owner.
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.

E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
   1. Official Project name and number, and any additional required identifiers established in Contract Documents.
   2. Owner's, Architect's, and Contractor's names.
   3. Discrete and consecutive RFI number, and descriptive subject/title.
   4. Issue date, and requested reply date.
   5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
   6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.
   2. Note dates of when each request is made, and when a response is received.

H. Responses:
   1. Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
   2. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
   3. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.

3.08 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Account for time required for preparation, review, manufacturing, fabrication and delivery when establishing submittal delivery and review deadline dates.
      a. For assemblies, equipment, systems comprised of multiple components and/or requiring detailed coordination with other work, allow for additional time to make corrections or revisions to initial submittals, and time for their review.

3.09 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below.

3.10 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.11 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in conformance to requirements of Section 017800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
3. Warranties.
5. Other types as indicated.
D. Submit for Owner's benefit during and after project completion.

3.12 NUMBER OF COPIES OF SUBMITTALS
A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.13 SUBMITTAL PROCEDURES
A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Transmit using approved form.
      a. Use Contractor's form, subject to prior approval by Architect.
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   6. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
   7. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   8. Provide space for Contractor and Architect review stamps.
   9. When revised for resubmission, identify all changes made since previous submission.
   10. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   11. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
   12. Submittals not requested will be recognized, and will be returned "Not Reviewed".
B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Submit concurrently with related shop drawing submittal.
   4. Do not submit (Material) Safety Data Sheets for materials or products.
C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related work.
   2. Do not reproduce the Contract Documents to create shop drawings.
   3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
D. Samples Procedures:
   1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval. Provide separate submittal page for each item image.

3.14 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.
B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.
C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
   1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.
D. Architect's and consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "Approved", or language with same legal meaning.
      b. "Approved as Noted", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
      c. Provide copy of all "Approved" and "Approved as Noted" submittals to Owner's Field Representative immediately following approval.
   2. Not Authorizing fabrication, delivery, and installation:
      a. "Revise and Resubmit".
         1) Resubmit revised item, with review notations acknowledged and incorporated.
         2) Non-responsive resubmittals may be rejected.
      b. "Rejected".
         1) Submit item complying with requirements of Contract Documents.
E. Architect's and consultants' actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

END OF SECTION 013000
SECTION 014000 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Quality assurance.
C. References and standards.
D. Testing and inspection agencies and services.
E. Control of installation.
F. Manufacturers' field services.
G. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 007200 - General Conditions: Inspections and approvals required by public authorities.
B. Section 013000 - Administrative Requirements: Submittal procedures.
C. Section 014216 - Definitions.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Conformance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.
   2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
   1. Submit report within 30 days of observation to Architect for information.
   2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

F. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
   1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
   2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications:
   1. Qualification Statement: Provide documentation showing testing laboratory is accredited under IAS AC89.

1.06 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

### 3.02 TESTING AND INSPECTION

A. See individual specification sections for testing and inspection required.

B. Testing Agency Duties:
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

C. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

D. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

E. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

F. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

### 3.03 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
3.04 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Owner, it is not practical to remove and replace the Work, Owner will direct an appropriate remedy or adjust payment.

END OF SECTION 014000
SECTION 014216 - DEFINITIONS

PART 1 GENERAL

1.01 SUMMARY

A. This section supplements the definitions contained in the General Conditions.

B. Other definitions are included in individual specification sections.

1.02 DEFINITIONS

A. Furnish: To supply, deliver, unload, and inspect for damage.

B. Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, start up, and make ready for use.

C. Product: Material, machinery, components, equipment, fixtures, and systems forming the work result. Not materials or equipment used for preparation, fabrication, conveying, or erection and not incorporated into the work result. Products may be new, never before used, or re-used materials or equipment.

D. Provide: To furnish and install.

E. Supply: Same as Furnish.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 014216
SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Temporary utilities.
   B. Temporary sanitary facilities.
   C. Temporary Controls: Barriers.
   D. Security requirements.
   E. Vehicular access and parking.
   F. Waste removal facilities and services.

1.02 TEMPORARY UTILITIES
   A. Owner will provide the following:
      1. Electrical power and metering, consisting of connection to existing facilities.
      2. Water supply, consisting of connection to existing facilities.
   B. Existing utilities may be used. Arrange use of temporary utilities with owner and coordinate utility charges that can be paid by the owner.
   C. Use trigger-operated nozzles for water hoses, to avoid waste of water.

1.03 TEMPORARY SANITARY FACILITIES
   A. Refer to Bid Package #2.

1.04 BARRIERS
   A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
   B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.05 SECURITY
   A. Coordinate with Owner’s security program.

1.06 VEHICULAR ACCESS AND PARKING
   A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
   B. Coordinate access and haul routes with governing authorities and Owner.
   C. Provide and maintain access to fire hydrants, free of obstructions.
   D. Provide means of removing mud from vehicle wheels before entering streets.
   E. Designated existing on-site roads may be used for construction traffic.
   F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.07 WASTE REMOVAL
   A. Refer to Bid Packages.

PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION 015000
SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Re-use of existing products.
B. Transportation, handling, storage and protection.
C. Product option requirements.
D. Substitution limitations.
E. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS
A. Section 012500 - Substitution Procedures: Substitutions made during and after the Bidding/Negotiation Phase.
B. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.
D. Section 220513 - Common Motor Requirements for Plumbing Equipment: Motors for plumbing equipment.
E. Section 230513 - Common Motor Requirements for HVAC Equipment: Motors for HVAC equipment.

1.03 SUBMITTALS
A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS
A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.

2.02 NEW PRODUCTS
A. Provide new products unless specifically required or permitted by the Contract Documents.
B. DO NOT USE products having any of the following characteristics:
   1. Containing lead, cadmium, asbestos.

2.03 PRODUCT OPTIONS
A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver and place in location as directed; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 012500 - Substitution Procedures.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer’s instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers’ instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

G. Comply with manufacturer’s warranty conditions, if any.

H. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
3.04 OFF-SITE STORAGE OF MATERIALS

A. Off-Site Storage of Materials is governed by Section 9.3.2 of the General Conditions of the Contract for Construction, AIA document (A201 – 1997 ed.) as modified by the Supplementary Conditions.

1. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner’s title to such materials and equipment or otherwise protect the Owner’s interest, and shall include the costs of applicable insurance, storage, and transportation to the site for such materials and equipment stored off the site. Off-site storage will not be approved more than 30 miles from the project site or outside of the State. Any materials stored off site and paid for by the Owner shall be physically marked as being the property of the State of Idaho.

B. Further in accordance with Section 9.3.2, the following shall apply:

1. The Contractor must provide at least thirty (30) days advance written notice of its request to store off site. Such notice must include a description of the type, quantities, locations, and values of materials involved for the next billing cycle. All invoices must indicate the type, quantities, and value of materials or equipment for which payment is requested.

2. All materials stored off-site must be segregated and clearly marked with the ITD project number and as being the “Property of the State of Idaho.”

3. The project architect and/or the ITD field representative must have unrestricted access to the stored materials during all business hours and may physically inventory all invoiced materials and may physically inspect the storage conditions.

4. The Contractor must provide written consent of surety to off-site storage of materials and equipment and to payment for such materials and equipment prior to incorporation in the Work. Consent must be of surety. Consent of local broker or agent is not acceptable.

5. The contractor must maintain and must provide to the project architect, upon request, a current log of stored materials and equipment, which reflects when materials are used or added.

6. The contractor must obtain and maintain on all materials and equipment stored off-site and in transit all risk property insurance at replacement cost, with the state of Idaho listed as loss payee.

END OF SECTION 016000
SECTION 016116 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Requirements for Indoor-Emissions-Restricted products.
B. Requirements for VOC-Content-Restricted products.

1.02 RELATED REQUIREMENTS
A. Section 014000 - Quality Requirements: Procedures for testing and certifications.
B. Section 016000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.
C. Section 079200 - Joint Sealants: Emissions-compliant sealants.

1.03 DEFINITIONS
A. Indoor-Emissions-Restricted Products: All products in the following product categories, whether specified or not:
   1. Interior paints and coatings.
   2. Interior adhesives and sealants, including flooring adhesives.
   3. Flooring.
   5. Products making up wall and ceiling assemblies.
   6. Thermal and acoustical insulation.
B. VOC-Content-Restricted Products: All products in the following product categories, whether specified or not:
   1. Exterior and interior paints and coatings.
   2. Exterior and interior adhesives and sealants, including flooring adhesives.
   3. Wet-applied roofing and waterproofing.
   4. Other products when specifically stated in the specifications.
C. Interior of Building: Anywhere inside the exterior weather barrier.
D. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.
E. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.
F. Inherently Non-Emitting Materials: Products composed wholly of minerals or metals, unless they include organic-based surface coatings, binders, or sealants; and specifically the following:
   1. Concrete.
   2. Clay brick.
   3. Metals that are plated, anodized, or powder-coated.
   4. Glass.
   5. Ceramics.

1.04 REFERENCE STANDARDS
1.05 QUALITY ASSURANCE

A. Indoor Emissions Standard and Test Method: CAL (CDPH SM), using Standard Private Office exposure scenario and the allowable concentrations specified in the method, and range of total VOC's after 14 days.
   1. Wet-Applied Products: State amount applied in mass per surface area.
   2. Paints and Coatings: Test tinted products, not just tinting bases.
   3. Evidence of Compliance: Acceptable types of evidence are the following:
      a. Test report showing compliance and stating exposure scenario used.
   4. Product data submittal showing VOC content is NOT acceptable evidence.
   5. Manufacturer's certification without test report by independent agency is NOT acceptable evidence.

B. VOC Content Test Method: 40 CFR 59, Subpart D (EPA Method 24), or ASTM D3960, unless otherwise indicated.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.
      b. Published product data showing compliance with requirements.
      c. Certification by manufacturer that product complies with requirements.

C. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. All Products: Comply with the most stringent of federal, State, and local requirements, or these specifications.

B. Indoor-Emissions-Restricted Products: Comply with Indoor Emissions Standard and Test Method, except for:
   2. Inherently Non-Emitting Materials.

C. VOC-Content-Restricted Products: VOC content not greater than required by the following:
   3. Paints and Coatings: Each color; most stringent of the following:
      a. 40 CFR 59, Subpart D.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. Additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION 016116
SECTION 017000 - EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.
B. Requirements for alterations work, including selective demolition.
C. Pre-installation meetings.
D. Cutting and patching.
E. Surveying for laying out the work.
F. Cleaning and protection.
G. Demonstration and instruction of Owner personnel.
H. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
I. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 013000 - Administrative Requirements: Submittals procedures.
B. Section 014000 - Quality Requirements: Testing and inspection procedures.
C. Section 015100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
D. Section 017419 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
E. Section 017800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
F. Section 017900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections
G. Section 024100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.03 REFERENCE STANDARDS


1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences. Include design drawings and calculations for bracing and shoring.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.
D. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   5. Work of Owner or separate Contractor.
6. Include in request:
   a. Identification of Project.
   b. Location and description of affected work.
   c. Necessity for cutting or alteration.
   d. Description of proposed work and products to be used.
   e. Effect on work of Owner or separate Contractor.
   f. Written permission of affected separate Contractor.
   g. Date and time work will be executed.

E. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS
A. For demolition work, employ a firm specializing in the type of work required.
B. For surveying work, employ a land surveyor registered in Idaho and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities.
C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Idaho.

1.06 PROJECT CONDITIONS
A. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
B. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
C. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.
   1. Outdoors: Limit conduct of especially noisy exterior work to the hours of 6 pm to 7 am.
D. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION
A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
B. Notify affected utility companies and comply with their requirements.
C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
F. Coordinate completion and clean-up of work of separate sections.
G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
PART 2 PRODUCTS

2.01 PATCHING MATERIALS
   A. New Materials: As specified in product sections; match existing products and work for patching and extending work.
   B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.
   C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.
   B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.
   C. Examine and verify specific conditions described in individual specification sections.
   D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.
   E. Verify that utility services are available, of the correct characteristics, and in the correct locations.
   F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION
   A. Clean substrate surfaces prior to applying next material or substance.
   B. Seal cracks or openings of substrate prior to applying next material or substance.
   C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS
   A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.
   B. Attendance required of parties directly affecting, or affected by, work of the specific section including:
      1. Owner
      2. Architect
      3. General Contractor
      4. Subcontractor
      5. Manufacturer's Representative
   C. Notify Architect four days in advance of meeting date.
   D. Prepare agenda and preside at meeting:
      1. Review conditions of examination, preparation and installation procedures.
      2. Review coordination with related work.
   E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK
   A. Verify locations of survey control points prior to starting work.
   B. Promptly notify Architect of any discrepancies discovered.
C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.
D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.
E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.
F. Utilize recognized engineering survey practices.
G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and ________.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations, and ________.
H. Periodically verify layouts by same means.
I. Maintain a complete and accurate log of control and survey work as it progresses.

3.05 GENERAL INSTALLATION REQUIREMENTS
A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.
B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.
B. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Verify that abandoned services serve only abandoned facilities.
4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
   1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
   2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
   3. Where a change of plane of 1/4 inch (6 mm) or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
G. Restore work with new products in accordance with requirements of Contract Documents.
H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
I. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING
A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
D. Collect and remove waste materials, debris, and trash/rubbish from site weekly and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK
A. Protect installed work from damage by construction operations.
B. Provide special protection where specified in individual specification sections.
C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
F. 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.
G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 DEMONSTRATION AND INSTRUCTION
A. See Section 017900 - Demonstration and Training.

3.11 ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.12 FINAL CLEANING
A. Use cleaning materials that are nonhazardous.
B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.
D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.
E. Clean filters of operating equipment.
F. Clean debris from roofs, gutters, downspouts, overflow drains, area drains, and drainage systems.
G. Clean site; sweep paved areas, rake clean landscaped surfaces.
H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.13 CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect and Owner.
B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.
E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.
F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.14 MAINTENANCE
A. Provide service and maintenance of components indicated in specification sections.
B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.
C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.
D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.
E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION 017000
SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Contractor shall submit periodic Waste Disposal Reports; all landfill disposal, recycling, salvage, and reuse must be reported regardless of to whom the cost or savings accrues; use the same units of measure on all reports.

E. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to Owner.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   4. Incinerator Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project delivered to incinerators.
      c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   5. Recycled and Salvaged Materials: Include the following information for each:
      a. Identification of material, including those retrieved by installer for use on other projects.
      b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.
      c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
      e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
   6. Material Reused on Project: Include the following information for each:
      a. Identification of material and how it was used in the project.
      b. Amount, in tons or cubic yards (cubic meters).
      c. Include weight tickets as evidence of quantity.
   7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

A. See Section 013000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.
2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Pre-bid meeting.
   2. Pre-construction meeting.
   3. Regular job-site meetings.
   4. Job safety meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION 017419
SECTION 017800 - CLOSEOUT SUBMITTALS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Project Record Documents.
   B. Operation and Maintenance Data.
   C. Warranties and bonds.

1.02 RELATED REQUIREMENTS
   A. Section 007200 - General Conditions and 007300 - Supplementary Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
   B. Section 013000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
   C. Section 017000 - Execution and Closeout Requirements: Contract closeout procedures.
   D. Individual Product Sections: Specific requirements for operation and maintenance data.
   E. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS
   A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
   B. Operation and Maintenance Data:
      1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
      2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
      3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
      4. Submit two sets of revised final documents in final form within 10 days after final inspection.
   C. Warranties and Bonds:
      1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
      2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
      3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION
3.01 PROJECT RECORD DOCUMENTS
   A. Maintain on site one set of the following record documents; record actual revisions to the Work:
      1. Accurate and complete "As-Built" drawings.
      2. Addenda.
      3. Change Orders and other modifications to the Contract.
   B. Ensure entries are complete and accurate, enabling future reference by Owner.
   C. Store record documents separate from documents used for construction.
   D. Record information concurrent with construction progress.
   E. Record Drawings: Legibly mark each item to record actual construction including:
      1. Field changes of dimension and detail.
2. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Source Data: For each product or system, list names, addresses and telephone numbers of Subcontractors and suppliers, including local source of supplies and replacement parts.

B. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

C. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

D. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:

1. Description of unit or system, and component parts.

2. Identify function, normal operating characteristics, and limiting conditions.

3. Include performance curves, with engineering data and tests.

4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

F. Provide servicing and lubrication schedule, and list of lubricants required.

G. Include manufacturer's printed operation and maintenance instructions.

H. Include sequence of operation by controls manufacturer.

I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

J. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
C. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.

I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

J. Arrangement of Contents: Organize each volume in parts as follows:
   1. Project Directory.
   2. Table of Contents, of all volumes, and of this volume.
   3. Operation and Maintenance Data: Arranged by system, then by product category.
      a. Source data.
      b. Product data, shop drawings, and other submittals.
      c. Operation and maintenance data.
      d. Field quality control data.
      e. Photocopies of warranties and bonds.
   4. Design Data: To allow for addition of design data furnished by Architect or others, provide a tab labeled "Design Data" and provide a binder large enough to allow for insertion of at least 20 pages of typed text.

3.06 WARRANTIES AND BONDS

A. Contractor agrees that all warranties and guarantees of materials, equipment and workmanship to the Owner shall also be for the specific benefit of the Idaho State Building Authority and, specifically agrees for itself and all of its subcontractors and suppliers that any and all provisions of any warranty or guaranty may be enforced by the Owner, the Idaho State Building Authority or any of its assignees or successors in interest.

B. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial completion is determined.

C. Verify that documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Retain warranties and bonds until time specified for submittal.

F. Manual: Bind in commercial quality 8-1/2 by 11 inch (216 by 279 mm) three D side ring binders with durable plastic covers.

G. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

H. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
I. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION 017800
SECTION 017900 - DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

A. Demonstration of products and systems where indicated in specific specification sections.

B. Training of Owner personnel in operation and maintenance is required for:
   1. All software-operated systems.
   2. HVAC systems and equipment.
   3. Plumbing equipment.
   4. Electrical systems and equipment.
   5. Items specified in individual product Sections.

C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
   1. Roofing, waterproofing, and other weather-exposed or moisture protection products.
   2. Finishes, including flooring, wall finishes, ceiling finishes.
   3. Fixtures and fittings.
   4. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

A. Section 017800 - Closeout Submittals: Operation and maintenance manuals.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
   1. Submit to Architect and Owner.
   2. Submit not less than four weeks prior to start of training.
   3. Revise and resubmit until acceptable.
   4. Provide an overall schedule showing all training sessions.
   5. Include at least the following for each training session:
      a. Identification, date, time, and duration.
      b. Description of products and/or systems to be covered.
      c. Name of firm and person conducting training; include qualifications.
      d. Intended audience, such as job description.
      e. Objectives of training and suggested methods of ensuring adequate training.
      f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
      g. Media to be used, such as slides, hand-outs, etc.
      h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.

C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

D. Training Reports:
   1. Identification of each training session, date, time, and duration.
   2. Sign-in sheet showing names and job titles of attendees.
   3. List of attendee questions and written answers given, including copies of and references to supporting documentation required for clarification; include answers to questions that could not be answered in original training session.
1.04 QUALITY ASSURANCE
   A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
      1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
      2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 DEMONSTRATION - GENERAL
   A. Demonstrations conducted during system start-up do not qualify as demonstrations for the purposes of this section, unless approved in advance by Owner.
   B. Demonstration may be combined with Owner personnel training if applicable.
   C. Operating Equipment and Systems: Demonstrate operation in all modes, including start-up, shut-down, seasonal changeover, emergency conditions, and troubleshooting, and maintenance procedures, including scheduled and preventive maintenance.
      1. Perform demonstrations not less than two weeks prior to Substantial Completion.
      2. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
   D. Non-Operating Products: Demonstrate cleaning, scheduled and preventive maintenance, and repair procedures.
      1. Perform demonstrations not less than two weeks prior to Substantial Completion.

3.02 TRAINING - GENERAL
   A. Conduct training on-site unless otherwise indicated.
   B. Owner will provide classroom and seating at no cost to Contractor.
   C. Provide training in minimum two hour segments.
   D. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.
   E. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
      1. The location of the O&M manuals and procedures for use and preservation; backup copies.
      2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
      3. Typical uses of the O&M manuals.
   F. Product- and System-Specific Training:
      1. Review the applicable O&M manuals.
      2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
      3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
      4. Provide hands-on training on all operational modes possible and preventive maintenance.
      5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
      6. Discuss common troubleshooting problems and solutions.
      7. Discuss any peculiarities of equipment installation or operation.
      8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
9. Review recommended tools and spare parts inventory suggestions of manufacturers.
10. Review spare parts and tools required to be furnished by Contractor.
11. Review spare parts suppliers and sources and procurement procedures.

G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION 017900
SECTION 024100 - DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.02 RELATED REQUIREMENTS

A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

D. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

PART 3 EXECUTION

2.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 017000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Use of explosives is not permitted.
   3. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   4. Provide, erect, and maintain temporary barriers and security devices.
   5. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permit.
   8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

F. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

G. Perform demolition in a manner that maximizes salvage and recycling of materials.
   1. Comply with requirements of Section 017419 - Waste Management.
2. Dismantle existing construction and separate materials.
3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

2.02 EXISTING UTILITIES
A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
B. Protect existing utilities to remain from damage.
C. Do not disrupt public utilities without permit from authority having jurisdiction.
D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.
F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

2.03 SELECTIVE DEMOLITION FOR ALTERATIONS
A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.
D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. Verify that abandoned services serve only abandoned facilities before removal.
   4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.
2.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.
B. Remove from site all materials not to be reused on site; comply with requirements of Section 017419 - Waste Management.
C. Leave site in clean condition, ready for subsequent work.
D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 024100
SECTION 030516 - UNDERSLAB VAPOR BARRIER

PART 1  GENERAL

1.01 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011 (Reapproved 2017).

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

PART 2  PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Barrier:
   1. Water Vapor Permeance: Not more than 0.010 perms (0.6 ng/(s m2 Pa)), maximum.
   2. Thickness: 15 mils (0.4 mm).
   3. Basis of Design:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil):
         www.stegoindustries.com/#sle.

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3  EXECUTION

3.01 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches (150 mm).

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION 030516
PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Shop fabricated steel items.

1.02  RELATED REQUIREMENTS
   A. Section 055213 - Pipe and Tube Railings.
   B. Section 099113 - Exterior Painting: Paint finish.
   C. Section 099123 - Interior Painting: Paint finish.

1.03  REFERENCE STANDARDS
   E. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
   F. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

1.04  SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. 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.

PART 2  PRODUCTS

2.01  MATERIALS - STEEL
   A. Steel Sections: ASTM A36/A36M.
   B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.
   C. Plates: ASTM A283/A283M.
   E. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02  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. 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.
   D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03  FABRICATED ITEMS
   A. Bumper Posts and Guard Rails: As detailed; prime paint finish.
   B. Bollards: Steel pipe, concrete filled, crowned cap, as detailed; prime paint finish.
C. Door Frames for Overhead Door Openings and Wall Openings: Channel sections; prime paint finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

3.03 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. Obtain approval prior to site cutting or making adjustments not scheduled.

END OF SECTION 055000
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Prefabricated stairs.
B. Structural steel stair framing and supports.
C. Handrails and guards.

1.02 REFERENCE STANDARDS

F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2018.
J. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.
L. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
N. NAAMM MBG 532 - Heavy Duty Metal Bar Grating Manual; 2009.

1.03 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide ____________.
C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.04 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Idaho, or personnel under direct supervision of such an engineer.
B. Fabricator Qualifications:
   1. A company specializing in manufacturing products specified in this section, with not less than five years of experience.
PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Prefabricated Metal Stairs:
   2. Substitutions: See Section 016000 - Product Requirements.

2.02 METAL STAIRS - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
   1. Regulatory Requirements: Provide stairs and railings complying with the most stringent requirements of local, state, and federal regulations; where requirements of the contract documents exceed those of regulations, comply with the contract documents.
   2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
   3. Structural Design: Provide complete stair and railing assemblies complying with the applicable local code.
      a. Stair Capacity: Uniform live load of 100 lb/sq ft (4.7 kPa) and a concentrated load of 300 lb (14.4 kg) with deflection of stringer or landing framing not to exceed 1/360 of span.
   4. Dimensions: As indicated on drawings.
   5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
   6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
   7. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
   1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
      a. Welded Joints: Continuously welded and ground smooth and flush.
      b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
      c. Exposed Edges and Corners: Eased to small uniform radius.
      d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.03 PREFABRICATED STAIRS

A. Modular Egress and Access Stairs: Standardized, modular stair components designed with manufacturer's standard stair angle and height charts; to be field assembled with mechanical fasteners only.
   1. Design Requirements: Comply with structural design criteria stated elsewhere in this section and the applicable requirements of ASTM E985.
      a. Comply with ADA Standards.
      b. Comply with applicable sections of the IBC.
   2. Materials: Manufacturer's standard steel tubes, plates, bars, shapes, sheets, wire and mesh complying with the requirements of the MATERIALS article of this section.
      a. Rails: Manufacturer's standard rails.
      b. Treads: Manufacturer's standard bar grate.
      c. Finish: Manufacturer's standard iron gray powder coat.
   3. Assembly Option: Shipped with balusters and rails mechanically attached to stringers; field assemble balance of components.

2.04 HANDRAILS AND GUARDS

A. Guards:
1. Top Rails: Round pipe or tube rails unless otherwise indicated.
   a. Outside Diameter: 1-1/4 inch (32 mm), minimum, to 1-1/2 inches (38 mm), maximum.
2. End and Intermediate Posts: Same material and size as top rails.
   a. Horizontal Spacing: As indicated on drawings.
   b. Mounting: Welded to top surface of stringer.

2.05 MATERIALS
A. Steel Sections: ASTM A36/A36M.
B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.
C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.
D. Gratings: Bar gratings complying with NAAMM MBG 531 or NAAMM MBG 532, whichever applies based on bar sizes.

2.06 ACCESSORIES
A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.
B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

2.07 SHOP FINISHING
A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION
A. When field welding is required, clean and strip primed steel items to bare metal.

3.03 INSTALLATION
A. Install components plumb and level, accurately fitted, free from distortion or defects.
B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.
D. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.
E. Obtain approval prior to site cutting or creating adjustments not scheduled.
F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES
A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

END OF SECTION 055100
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Finish carpentry items.

1.02 RELATED REQUIREMENTS
A. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
B. Section 081416 - Flush Wood Doors.
C. Section 099123 - Interior Painting: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS
B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.
B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 QUALITY ASSURANCE
A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of experience.
   1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
B. Quality Certification:
   1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
   2. Provide labels or certificates indicating that the work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
   3. Provide designated labels on shop drawings as required by certification program.
   4. Provide designated labels on installed products as required by certification program.
   5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS
A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.
C. Interior Woodwork Items:
   1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.

2.02 WOOD-BASED COMPONENTS
A. Wood fabricated from old growth timber is not permitted.
2.03 FABRICATION
   A. Shop assemble work for delivery to site, permitting passage through building openings.
   B. When necessary to cut and fit on site, provide materials with ample allowance for cutting.
      Provide trim for scribing and site cutting.

2.04 SHOP FINISHING
   A. Sand work smooth and set exposed nails and screws.
   B. Apply wood filler in exposed nail and screw indentations.
   C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and
      is of type recommended for the applicable finish.
   D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 -
      Finishing for grade specified and as follows:
      1. Transparent:
         a. System - 1, Lacquer, Nitrocellulose.
         b. Stain: As selected by Architect.
         c. Sheen: Satin.
      2. Opaque:
         b. Color: As selected by Architect.
         c. Sheen: Satin.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify adequacy of backing and support framing.
   B. Verify mechanical, electrical, and building items affecting work of this section are placed and
      ready to receive this work.

3.02 INSTALLATION
   A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements
      for grade indicated.
   B. Set and secure materials and components in place, plumb and level.
   C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm).
      Do not use additional overlay trim to conceal larger gaps.

3.03 PREPARATION FOR SITE FINISHING
   A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

3.04 TOLERANCES
   A. Maximum Variation from True Position: 1/16 inch (1.6 mm).
   B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

END OF SECTION 062000
SECTION 064100 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Specially fabricated cabinet units.
   B. Countertops.
   C. Cabinet hardware.

1.02 RELATED REQUIREMENTS
   A. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS
   A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).
   D. BHMA A156.9 - American National Standard for Cabinet Hardware; 2015.

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
      1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).
   C. Product Data: Provide data for hardware accessories.

1.05 QUALITY ASSURANCE
   A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
      1. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.
   B. Quality Certification:
      1. Comply with AWI (QCP) woodwork association quality certification service/program in accordance with requirements for work specified in this section: www.awiqcp.org/#sle.
      2. Provide labels or certificates indicating that the installed work complies with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade or grades specified.
      3. Provide designated labels on shop drawings as required by certification program.
      4. Provide designated labels on installed products as required by certification program.
      5. Submit certifications upon completion of installation that verifies this work is in compliance with specified requirements.
      6. Replace, repair, or rework all work for which certification is refused.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Protect units from moisture damage.

1.07 FIELD CONDITIONS
   A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Substitutions: See Section 016000 - Product Requirements.
2.02 CABINETS
A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.03 WOOD-BASED COMPONENTS
A. Wood fabricated from old growth timber is not permitted.

2.04 COUNTERTOPS
A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated and self-edge banded.

2.05 HARDWARE
A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards and coordinated self rests, satin chrome finish, for nominal 1 inch (25 mm) spacing adjustments.
C. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers ("U" shaped wire pull, steel with satin finish, 100 mm centers).
D. Drawer Slides:
   1. Type: Standard extension.
   2. Static Load Capacity: Commercial grade.
E. Hinges: Concealed (fully mortised) self-closing type, steel with satin finish.

2.06 FABRICATION
A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

2.07 SHOP FINISHING
A. Sand work smooth and set exposed nails and screws.
B. For opaque finishes, apply wood filler in exposed nail and screw indentations and sand smooth.
C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify adequacy of backing and support framing.
B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION
A. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.
B. Use fixture attachments in concealed locations for wall mounted components.
C. Use concealed joint fasteners to align and secure adjoining cabinet units.
D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.
E. Secure cabinets to floor using appropriate angles and anchorages.
F. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.03 ADJUSTING
A. Adjust installed work.
3.04 CLEANING
   A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION 064100
PART 1 GENERAL

1.01 REFERENCE STANDARDS


1.02 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

PART 2 PRODUCTS

2.01 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Complies with fire resistance requirements shown on the drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   4. Board Size: 48 inch by 96 inch (1220 mm by 2440 mm).
   6. Type and Thermal Resistance, R-value (RSI-value): Type XI, 3.1 (0.55) per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
B. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
   2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
   5. Complies with fire resistance requirements shown on the drawings as part of an exterior non-load-bearing exterior wall assembly when tested in accordance with NFPA 285.
   6. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.

2.02 BATT INSULATION MATERIALS

A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
   1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
   2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136.
   5. Manufacturers:
      c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.
d. Substitutions: See Section 016000 - Product Requirements.

2.03 ACCESSORIES
A. Sheet Vapor Retarder: Black polyethylene film for above grade application, 10 mil, 0.010 inch (0.25 mm) thick.
B. Interior Vapor Retarder: Modified polyethylene/polyacrylate (PE/PA) film reinforced with polyethylene terephthalate (PET) fibers, 12 mils, 0.012 inch (0.30 mm) thick.
   1. Width: 4.9 feet (1.5 m).
C. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
   1. Application: Sealing of interior circular penetrations, such as pipes or cables.
   2. Width: Are required for application.
   3. Temperature Resistance: Minus 40 degrees F to 212 degrees F (Minus 40 degrees C to 100 degrees C)

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
B. Verify substrate surfaces are flat, free of irregularities or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT CAVITY WALLS
A. Install boards to fit snugly between wall ties.
B. Install boards horizontally on walls.
C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION OVER LOW SLOPE ROOF DECK
A. Board Installation Over Roof Deck, General:
   1. See applicable roofing specification section for specific board installation requirements.
   2. Fasten insulation to deck in accordance with roofing manufacturer's written instructions and applicable Factory Mutual requirements.
   3. Do not apply more insulation than can be covered with roofing in same day.

3.04 BATT INSTALLATION
A. Install insulation and vapor retarder in accordance with manufacturer's instructions.
B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
C. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
D. At wood framing, place vapor retarder on warm side of insulation by stapling at 6 inches (150 mm) on center. Lap and seal sheet retarder joints over member face.
E. At metal framing, place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.
F. Tape seal tears or cuts in vapor retarder.
G. Extend vapor retarder tightly to full perimeter of adjacent window and door frames and other items interrupting the plane of the membrane. Tape seal in place.

3.05 PROTECTION
A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 072100
PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Nonsag gunnable joint sealants.
   B. Self-leveling pourable joint sealants.
   C. Joint backings and accessories.
1.02 RELATED REQUIREMENTS
   A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions: Additional requirements for sealants and primers.
1.03 REFERENCE STANDARDS
1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
      1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
      2. List of backing materials approved for use with the specific product.
      3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
      4. Substrates the product should not be used on.
      5. Substrates for which use of primer is required.
      6. Installation instructions, including precautions, limitations, and recommended backing materials and tools.
   C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
1.05 QUALITY ASSURANCE
   A. Installer Qualifications: Company specializing in performing the work of this section and with at least three years of documented experience.

PART 2 PRODUCTS
2.01 JOINT SEALANT APPLICATIONS
   A. Scope:
      1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
         a. Wall expansion and control joints.
         b. Joints between door, window, and other frames and adjacent construction.
         c. Joints between different exposed materials.
         d. Openings below ledge angles in masonry.
         e. Other joints indicated below.
2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. Other joints indicated below.
3. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

B. Type 1 - Exterior Joints: Use non-sag non-staining silicone sealant, unless otherwise indicated.
C. Type 3 - Interior Joints: Use non-sag polyurethane sealant, unless otherwise indicated.
   1. Type 4 - Wall and Ceiling Joints in Non-Wet Areas: Acrylic emulsion latex sealant.
   2. Type 2 - Joints between Fixtures in Wet Areas and Floors, Walls, and Ceilings: Mildew-resistant silicone sealant; white.
   3. Type ___ - Narrow Control Joints in Interior Concrete Slabs: Self-leveling epoxy sealant.
   4. Type ___ - Other Floor Joints: Self-leveling polyurethane “traffic-grade” sealant.

D. Interior Wet Areas: restrooms; fixtures in wet areas include plumbing fixtures, countertops, and other similar items.

2.02 JOINT SEALANTS - GENERAL
A. Sealants and Primers: Provide products with levels of volatile organic compound (VOC) content as indicated in Section 016116.

2.03 NONSAG JOINT SEALANTS
A. Type 1 - Non-Staining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   2. Non-Staining To Porous Stone: Non-staining to light-colored natural stone when tested in accordance with ASTM C1248.
   3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
   4. Color: To be selected by Architect from manufacturer’s standard range.
   5. Manufacturers:
      f. Tremco Commercial Sealants & Waterproofing; Spectrem 1: www.tremcosaleants.com/#sle.
      g. Tremco Commercial Sealants & Waterproofing; Spectrem 2: www.tremcosaleants.com/#sle.
      h. Tremco Commercial Sealants & Waterproofing; Spectrem 3: www.tremcosaleants.com/#sle.
      i. Substitutions: See Section 016000 - Product Requirements.
B. Type 2 - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
   2. Manufacturers:
b. Substitutions:  See Section 016000 - Product Requirements.

C. Type 3 - Polyurethane Sealant:  ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
2. Color:  To be selected by Architect from manufacturer's standard range.
3. Manufacturers:
   a. The QUIKRETE Companies; QUIKRETE® Polyurethane Non-Sag Sealant:  www.quikrete.com/#sle.
   d. Sika Corporation; Sikaflex-2c NS:  www.usa-sika.com/#sle.
   e. Tremco Commercial Sealants & Waterproofing; Dymonic 100:  www.tremcosan.com/#sle.
   f. Tremco Commercial Sealants & Waterproofing; Dymeric 240 FC:  www.tremcosan.com/#sle.
   g. W. R. MEADOWS, Inc; POURTHANE NS:  www.wrmeadows.com/#sle.
   h. Substitutions:  See Section 016000 - Product Requirements.

D. Type 4 - Acrylic Emulsion Latex:  Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color:  Standard colors matching finished surfaces, Type OP (opaque).
2. Manufacturers:
   b. Tremco Commercial Sealants & Waterproofing; Tremflex 834:  www.tremcosan.com/#sle.
   c. Tremco Commercial Sealants & Waterproofing; Tremstop Smoke & Sound:  www.tremcosan.com/#sle.
   d. Substitutions:  See Section 016000 - Product Requirements.

2.04 SELF-LEVELING SEALANTS

A. Type 5 - Self-Leveling Polyurethane Sealant for Continuous Water Immersion:  Polyurethane; ASTM C920, Grade P, Uses M and A; single or multi-component; explicitly approved by manufacturer for traffic exposure and continuous water immersion.
2. Color:  Gray.
3. Manufacturers:
   d. Substitutions:  See Section 016000 - Product Requirements.

B. Type 6 - Semi-Rigid Self-Leveling Epoxy Joint Filler:  Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
1. Composition:  Multi-component, 100 percent solids by weight.
2. Hardness:  Minimum of 85 (Shore A) or 35 (Shore D), when tested in accordance with ASTM D2240 after 7 days.
3. Color:  Concrete gray.
4. Joint Width, Minimum:  1/8 inch (3 mm).
5. Joint Width, Maximum:  1/4 inch (6 mm).
6. Joint Depth:  Provide product suitable for joints from 1/8 inch (3 mm) to 2 inches (51 mm) in depth including space for backer rod.
7. Manufacturers:
d. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
   1. Type for Joints Not Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type O - Open Cell Polyurethane.
   2. Type for Joints Subject to Pedestrian or Vehicular Traffic: ASTM C1330; Type B - Bi-Cellular Polyethylene.
   3. Open Cell: 40 to 50 percent larger in diameter than joint width.
   4. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.

D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

E. Primers: Type recommended by sealant manufacturer to suit application; non-staining.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.
B. Verify that backing materials are compatible with sealants.
C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.
B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
B. Perform installation in accordance with ASTM C1193.
C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
D. Install bond breaker backing tape where backer rod cannot be used.
E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
F. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
G. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

H. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 POST-OCCUPANCY

A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION 079200
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.
B. Hollow metal frames for wood doors.
C. Fire-rated hollow metal doors and frames.
D. Thermally insulated hollow metal doors with frames.

1.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware.
B. Section 088000 - Glazing: Glass for doors and borrowed lites.
C. Section 099113 - Exterior Painting: Field painting.
D. Section 099123 - Interior Painting: Field painting.

1.03 ABBREVIATIONS AND ACRONYMMS

B. ASCE - American Society of Civil Engineers.
C. HMMA - Hollow Metal Manufacturers Association.
D. NAAMM - National Association of Architectural Metal Manufacturers.
F. SDI - Steel Door Institute.
G. UL - Underwriters Laboratories.

1.04 REFERENCE STANDARDS

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).
D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.
F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2018.
I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.
K. ITS (DIR) - Directory of Listed Products; current edition.
M. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.
Q. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protective; 2016.
S. UL (DIR) - Online Certifications Directory; Current Edition.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
D. Manufacturer's Qualification Statement.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: www.steeldoor.org/sdicertified.php.
B. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Hollow Metal Doors and Frames:
1. Ceco Door, an Assa Abloy Group company; ______: www.assaabloydss.com/#sle.
2. Curries, an Assa Abloy Group company; ______: www.assaabloydss.com/#sle.

2.02 DESIGN CRITERIA
A. Requirements for Hollow Metal Doors and Frames:
1. Steel used for fabrication of doors and frames shall comply with one or more of the following requirements; Galvannealed steel conforming to ASTM A653/A653M, cold-rolled steel conforming to ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel conforming to ASTM A1011/A1011M, Commercial Steel (CS) Type B for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
4. Door Edge Profile: Manufacturers standard for application indicated.
5. Typical Door Face Sheets: Flush.

7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Hollow Metal Panels: Same construction, performance, and finish as doors.

C. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
   3. Door Thickness: 1-3/4 inch (44.5 mm), nominal.
   4. Weatherstripping: Refer to Section 087100.

C. Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
   2. Door Thickness: 1-3/4 inch (44.5 mm), nominal.

D. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 2 - Heavy-duty.
      b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
      e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Temperature-Rise Rating (TRR) Across Door Thickness: In accordance with local building code and authorities having jurisdiction.
   4. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      a. Attach fire rating label to each fire rated unit.
   5. Smoke and Draft Control Doors: Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following:
      a. Maximum Air Leakage: 3.0 cfm/sq ft (0.02 cu m/sec/sq m) of door opening at 0.10 inch w.g. (24.9 Pa) pressure, when tested in accordance with UL 1784 at both ambient and elevated temperatures.
      b. Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.
      c. Label: Include the "S" label on fire-rating label of door.
2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Exterior Door Frames: Full profile/continuously welded type.
   1. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
   2. Frame Finish: Factory primed and field finished.
   3. Weatherstripping: Separate, see Section 087100.

C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
   2. Frame Finish: Factory primed and field finished.

D. Door Frames, Fire-Rated: Full profile/continuously welded type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.
   3. Frame Finish: Factory primed and field finished.

E. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

F. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch (102 mm) high to fill opening without cutting masonry units.

G. Frames Wider than 48 inches (1219 mm): Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.06 ACCESSORIES

A. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.
   1. In Fire-Rated Doors: UL (DIR) or ITS (DIR) listed fusible link louver, same rating as door.

B. Glazing: As specified in Section 088000, factory installed.

C. Astragals for Double Doors: Specified in Section 087100.

D. Grout for Frames: Portland cement grout with maximum 4 inch (102 mm) slump for hand troweling; thinner pumpable grout is prohibited.

E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.
3.03 INSTALLATION
   A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
   B. Install fire rated units in accordance with NFPA 80.
   C. Coordinate frame anchor placement with wall construction.
   D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
   E. Install door hardware as specified in Section 087100.
      1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
   F. Comply with glazing installation requirements of Section 088000.
   G. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES
   A. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING
   A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE
   A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 081113
SECTION 081216 ALUMINUM FRAMES

This suggested guide specification has been developed using the current edition of the Construction Specifications Institute (CSI) “Manual of Practice”, including the recommendations for the CSI 3 Part Section Format and the CSI Page Format. Additionally, the development concept and organizational arrangement of the American Institute of Architects (AIA) MASTERSPEC Program has been recognized in the preparation of this guide specification. Neither CSI, AIA, USGBC nor ILFI endorse specific manufacturers and products. The preparation of the guide specification assumes the use of standard contract documents and forms, including the “Conditions of the Contract”, published by the AIA.

PART 1 - GENERAL

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

1.2 Summary
A. Section Includes: Kawneer Architectural Aluminum Storefront Systems, including perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of storefront units.
   1. Types of Kawneer Aluminum Storefront Systems include:
      a. InFrame™ Interior Framing System - 2” x 6” (50.8 x 152.4) nominal dimension; Non-Thermal; Center Glazed, Screw Spline, Punched Opening Fabrication.

1.3 Definitions
A. Definitions: For fenestration industry standard terminology and definitions refer to American Architectural Manufacturers Association (AAMA) – AAMA Glossary (AAMA AG).

1.4 Performance Requirements
A. Storefront System Performance Requirements: Interior framing system.
B. Environmental Product Declaration (EPD): Shall have a Type III Product-Specific EPD created from a Product Category Rule.

1.5 Submittals
A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, hardware, finishes, and installation instructions for each type of aluminum frames indicated.
B. Shop Drawings: Include plans, elevations, sections, details, hardware, and attachments to other work, operational clearances and installation details.
C. Samples for Initial Selection: For units with factory-applied color finishes including samples of hardware and accessories involving color selection.
D. Samples for Verification: For aluminum frames and components required.
E. Fabrication Sample: Of each vertical-to-horizontal intersection of aluminum frames, made from 12" (304.8 mm) lengths of full-size components and showing details of the following:
   1. Joinery, including concealed welds.
   2. Anchorage.
   5. Flashing and drainage.

1.6 Quality Assurance
A. Installer Qualifications: An installer which has had successful experience with installation of the same or similar units required for the project and other projects of similar size and scope.
B. Manufacturer Qualifications: A manufacturer capable of providing aluminum frames that meet or exceed performance requirements indicated and of documenting this performance by inclusion of test reports, and calculations.
C. Source Limitations: Obtain aluminum frames through one source from a single manufacturer.
D. Product Options: Drawings indicate size, profiles, and dimensional requirements of aluminum frames and are based on the specific system indicated. Refer to Division 01 Section “Product Requirements”. Do not modify size and dimensional requirements.
   1. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect’s approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
1.7 Project Conditions

A. Field Measurements: Verify actual dimensions of aluminum frame openings by field measurements before fabrication and indicate field measurements on Shop Drawings.

1.8 Warranty

A. Manufacturer’s Warranty: Submit, for Owner’s acceptance, manufacturer’s standard warranty.

B. Warranty Period: Two (2) years from Date of Substantial Completion of the project provided however that the Limited Warranty shall begin in no event later than six months from date of shipment by manufacturer.

PART 2 - PRODUCTS

2.1 Manufacturers

A. Basis-of-design Product:
   1. Kawneer Company Inc.
   2. InFrame™ Interior Framing System (Non-Thermal)
   3. System Dimensions: 2” x 6” (50.8 x 152.4) nominal dimension
   4. Glass: Center Plane

B. Substitutions: Refer to Substitutions Section for procedures and submission requirements.
   1. Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid storefront installation and construction delays.
   2. Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.
   3. Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for storefront system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum storefront for a period of not less than ten (10) years. (Company Name)
   4. Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

C. Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.2 Materials

A. Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070” (1.8 mm) wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.

B. Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum framing members, trim hardware, anchors, and other components.

C. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

D. Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.

E. Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

F. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.

2.3 Storefront Framing System

A. Brackets and Reinforcements: Manufacturer’s standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

B. Fasteners and Accessories: Manufacturer’s standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials. Where exposed shall be stainless steel.

C. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

D. Packing, Shipping, Handling and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

E. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect storefront material against damage from elements, construction activities, and other hazards before, during and after storefront installation.
2.4 Glazing Systems

A. Glazing: As specified in Division 08 Section “Glazing”.

B. Glazing Gaskets: Manufacturer’s standard compression types; replaceable, extruded EPDM rubber.

C. Spacers and Setting Blocks: Manufacturer’s standard elastomeric type.

D. Bond-Breaker Tape: Manufacturer’s standard TFE-fluorocarbon or polyethylene material to which sealants will not develop adhesion.

E. Glazing Sealants: For structural-sealant-glazed systems, as recommended by manufacturer for joint type, and as follows:
   1. Weatherseal Sealant: ASTM C 920 for Type S, Grade NS, Class 25, Uses NT, G, A, and O; single-component neutral-curing formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and aluminum-framed-system manufacturers for this use.

2.5 Accessory Materials

A. Joint Sealants: For installation at perimeter of aluminum-framed systems, as specified in Division 07 Section “Joint Sealants”.

B. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 30 mil (0.762 mm) thickness per coat.

2.6 Fabrication

A. Extrude aluminum shapes before finishing.

B. Framing Members, General: Fabricate components that, when assembled, have the following characteristics:
   1. Profiles that are sharp, straight, and free of defects or deformations.
   2. Accurately fit joints; make joints flush, hairline and weatherproof.
   3. Physical and thermal isolation of glazing from framing members.
   4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
   5. Provisions for field replacement of glazing.
   6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

C. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

D. Storefront Framing: Fabricate components for assembly using manufacturer’s standard installation instructions.
   1. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

2.7 Aluminum Finishes

A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes:

PART 3 - EXECUTION

3.1 Examination

A. Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight aluminum frame installation.
   1. Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.
   2. Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76 mm) of opening.
   3. Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.
   4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 Installation

A. Comply with Drawings, Shop Drawings, and manufacturer’s written instructions for installing aluminum framed storefront system, accessories, and other components.

B. Install aluminum framed storefront system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

C. Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.3 Field Quality Control

A. Manufacturer’s Field Services: Upon Owner’s written request, provide periodic site visit by manufacturer’s field service representative.
3.4 Adjusting, Cleaning, and Protection

A. Clean aluminum surfaces immediately after installing aluminum framed storefronts. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.

B. Clean glass immediately after installation. Comply with glass manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels, and clean surfaces.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

DISCLAIMER STATEMENT

This guide specification is intended to be used by a qualified construction specifier. The guide specification is not intended to be verbatim as project specification without appropriate modifications for the specific use intended. The guide specification must be used and coordinated with the procedures of each design firm, and the particular requirements of a specific construction project.

END OF SECTION 081216
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Flush wood doors; flush and flush glazed configuration; non-rated.

1.02 RELATED REQUIREMENTS
   A. Section 081113 - Hollow Metal Doors and Frames.
   B. Section 087100 - Door Hardware.
   C. Section 088000 - Glazing.

1.03 REFERENCE STANDARDS
   B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

1.04 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
   C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
   D. Samples: Submit two samples of door veneer, 6 by 6 inch (152.4 by 152.5 mm) in size illustrating wood grain, stain color, and sheen.
   E. Warranty, executed in Owner's name.

1.05 DELIVERY, STORAGE, AND HANDLING
   A. Package, deliver and store doors in accordance with specified quality standard.
   B. Accept doors on site in manufacturer's packaging. Inspect for damage.
   C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.06 WARRANTY
   A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
   B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
   C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Wood Veneer Faced Doors:

2.02 DOORS AND PANELS
   A. Doors: Refer to drawings for locations and additional requirements.
      1. Quality Standard: Premium Grade, Standard Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
      2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
   B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
      1. Provide solid core doors at each location.
      2. Wood veneer facing with factory transparent finish.
2.03 DOOR AND PANEL CORES
   A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.

2.04 DOOR FACINGS
   A. Veneer Facing for Transparent Finish: Red oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match for spliced veneer leaves assembled on door or panel face.
      1. Vertical Edges: Any option allowed by quality standard for grade.

2.05 DOOR CONSTRUCTION
   A. Fabricate doors in accordance with door quality standard specified.
   B. Cores Constructed with stiles and rails:
      1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
   C. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
   D. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
   E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   F. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS
   A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
      1. Transparent:
         a. System - 1, Lacquer, Nitrocellulose.
         b. Sheen: Flat.

2.07 ACCESSORIES
   A. Hollow Metal Door Frames: As specified in Section 081113.
   B. Glazed Openings:
      1. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
   C. Door Hardware: As specified in Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify existing conditions before starting work.
   B. Verify that opening sizes and tolerances are acceptable.
   C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION
   A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
   C. Use machine tools to cut or drill for hardware.
   D. Coordinate installation of doors with installation of frames and hardware.

3.03 ADJUSTING
   A. Adjust doors for smooth and balanced door movement.
   B. Adjust closers for full closure.

END OF SECTION 081416
SECTION 087100 - DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Hardware for wood, aluminum, hollow metal, and _____ doors.
B. Hardware for fire-rated doors.
C. Lock cylinders for doors that hardware is specified in other sections.
D. Thresholds.
E. Weatherstripping and gasketing.

1.02 RELATED REQUIREMENTS
A. Section 081113 - Hollow Metal Doors and Frames.
B. Section 081416 - Flush Wood Doors.
C. Section 084313 - Aluminum-Framed Storefronts: Door hardware, except as noted in section.

1.03 REFERENCE STANDARDS
B. BHMA A156.1 - American National Standard for Butts and Hinges; 2016.
D. BHMA A156.3 - American National Standard for Exit Devices; 2014.
E. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.
F. BHMA A156.6 - American National Standard for Architectural Door Trim; 2015.
I. BHMA A156.21 - American National Standard for Thresholds; 2014.
L. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.
Q. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.
B. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. **Product Data:** Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. **Shop Drawings - Door Hardware Schedule:** Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
   2. List groups and suffixes in proper sequence.
   3. Provide complete description for each door listed.
   4. Provide manufacturer's and product names, and catalog numbers; include functions, types, styles, sizes and finishes of each item.
   5. Include account of abbreviations and symbols used in schedule.

**PART 2 PRODUCTS**

### 2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:
   1. Applicable provisions of federal, state, and local codes.
   4. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
   5. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR) or testing firm acceptable to authorities having jurisdiction as suitable for application indicated.
   7. Hardware Preparation for Wood Doors with Wood or Steel Frames: BHMA A156.115W.
   8. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

D. **Fasteners:**
   1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
      a. Aluminum fasteners are not permitted.
      b. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.
   2. Provide machine screws for attachment to reinforced hollow metal and aluminum frames.
      a. Self-drilling (Tek) type screws are not permitted.
   3. Provide stainless steel machine screws and lead expansion shields for concrete and masonry substrates.
      a. Provide wood or machine screws for hinges mortised to doors or frames, strike plates to frames, and closers to doors and frames.
      b. Provide steel through bolts for attachment of surface mounted closers, hinges, or exit devices to door panels unless proper door blocking is provided.

### 2.02 HINGES

A. **Manufacturers:**
   1. McKinney; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
B. Hinges: Complying with BHMA A156.1, Grade 1.
   1. Butt Hinges: Complying with BHMA A156.1 and BHMA A156.7 for templated hinges.
      a. Provide hinge width required to clear surrounding trim.
   2. Provide hinges on every swinging door.
   3. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   4. Provide ball-bearing hinges at each door.
   5. Provide non-removable pins on exterior outswinging doors.
   6. Provide power transfer hinges where electrified hardware is mounted in door leaf.
   7. Provide following quantity of butt hinges for each door:
      a. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
      b. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.

2.03 EXIT DEVICES

A. Manufacturers:
   1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company; ______: www.assaabloydss.com/#sle.
   5. Hager Companies; ______: www.hagerco.com/#sle.

B. Exit Devices: Complying with BHMA A156.3, Grade 1.
   1. Lever design to match lockset trim.
   2. Provide cylinder with cylinder dogging or locking trim.
   3. Provide exit devices properly sized for door width and height.
   4. Provide strike as recommended by manufacturer for application indicated.
   5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.04 LOCK CYLINDERS

A. Manufacturers:
   1. Best, dormakaba Group; ______: www.bestaccess.com/#sle.

B. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
   1. Provide cylinders from same manufacturer as locking device.
   2. Provide cams and/or tailpieces as required for locking devices.

2.05 CYLINDRICAL LOCKS

A. Manufacturers:
   1. Corbin Russwin, Sargent, or Yale; an Assa Abloy Group company; ______: www.assaabloydss.com/#sle.
   2. Best, dormakaba Group; ______: www.bestaccess.com/#sle.

B. Cylindrical Locks (Bored): Complying with BHMA A156.2, Grade 1, 4000 Series.
   1. Bored Hole: 2-1/8 inch (54 mm) diameter.
   2. Latchbolt Throw: 1/2 inch (12.7 mm), minimum.
   3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
   4. Strikes: Provide manufacturer’s standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
      a. Finish: To match lock or latch.
   5. Trim: Provide lever handle or pull trim on outside of each lock, unless otherwise indicated.
2.06 DOOR PULLS AND PUSH PLATES

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.

B. Door Pulls and Push Plates: Complying with BHMA A156.6.
   1. Pull Type: Straight, unless otherwise indicated.
   2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
      a. Edges: Beveled, unless otherwise indicated.
   3. Material: Aluminum, unless otherwise indicated.
   4. Provide door pulls and push plates on doors without a lockset, latchset, exit device, or auxiliary lock unless otherwise indicated.
   5. On glazed storefront doors, provide push bar width of door with pull handle unless otherwise indicated.

2.07 DOOR PULLS AND PUSH BARS

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.

B. Door Pulls and Push Bars: Complying with BHMA A156.6.
   1. Bar Type: Push bar, unless otherwise indicated.
   2. Material: Aluminum, unless otherwise indicated.

2.08 COORDINATORS

A. Manufacturers:
   1. Rockwood; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   2. DORMA USA, Inc; TS93 GSR: www.dorma.com/#sle.
   3. Ives, an Allegion brand; _____: www.allegion.com/us/#sle.

B. Coordinators: Provide on doors having closers and self-latching or automatic flush bolts to ensure that inactive door leaf closes before active door leaf.
   1. Type: Universal, unless otherwise indicated.
   2. Material: Aluminum, unless otherwise indicated.
   3. Ensure that coordination of other door hardware affected by placement of coordinators and carry bar is applied properly for completely operable installation.

2.09 CLOSERS

A. Manufacturers; Surface Mounted:
   1. Corbin Russwin, Norton, Rixson, Sargent, or Yale; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   3. DORMA USA, Inc; 7400 Series, 8600 Series, 8900 Series, and TS93: www.dorma.com/#sle.
   5. LCN, an Allegion brand; _____: www.allegion.com/us/#sle.

B. Closers: Complying with BHMA A156.4, Grade 1.
   1. Type: Surface mounted to door.
   2. Provide door closer on each exterior door.

2.10 ASTRAGALS

A. Manufacturers:
   1. Pemko; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.

B. Astragals: Complying with BHMA A156.22.
1. Provide surface mounted astragal to cover or fill space for full door height between pair of doors or door and adjacent jamb.
2. Type: Split, two parts, and with sealing gasket.
3. Material: Aluminum, with neoprene weatherstripping.
4. Provide non-corroding fasteners at exterior locations.

2.11 THRESHOLDS
A. Manufacturers:
1. Pemko; an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.

B. Thresholds: Complying with BHMA A156.21.
1. Provide threshold at interior doors for transition between two different floor types, unless otherwise indicated.
2. Provide threshold at each exterior door, unless otherwise indicated.
3. Type: Flat surface.
5. Threshold Surface: Fluted horizontal grooves across full width.
6. Field cut threshold to profile of frame and width of door sill for tight fit.
7. Provide non-corroding fasteners at exterior locations.

2.12 WEATHERSTRIPPING AND GASKETING
A. Weatherstripping and Gasketing: Complying with BHMA A156.22.
1. Head and Jamb Type: Adjustable.
2. Door Sweep Type: Encased in retainer.
3. Material: Aluminum, with brush weatherstripping.
4. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated.
5. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.13 FINISHES
A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
1. Primary Finish: 630; satin stainless steel, with stainless steel 3000 series base material (former US equivalent US32D); BHMA A156.18.
2. Secondary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
a. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.
3. Exceptions:
a. Where base material metal is specified to be different, provide finish that is an equivalent appearance in accordance with BHMA A156.18.
c. Door Closer Covers and Arms: Color as selected by Architect from manufacturer's standard colors unless otherwise indicated.
d. Hardware for Aluminum Storefront Doors: Finished to match door panel finish, except at hand contact surfaces provide stainless steel with satin finish, unless otherwise indicated.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.
B. Verify that electric power is available to power operated devices and of correct characteristics.

3.02 INSTALLATION
A. Install hardware in accordance with manufacturer’s instructions and applicable codes.
B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.
C. Use templates provided by hardware item manufacturer.
D. Do not install surface mounted items until application of finishes to substrate are fully completed.
E. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list, unless noted otherwise on drawings.
   1. For Steel Doors and Frames: Refer to Section 081113.
   2. For Aluminum-Framed Storefront Doors and Frames: Refer to Section 084313.
   3. Flush Wood Doors: Refer to Section 081416.
   4. Mounting heights in compliance with ADA Standards:
F. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.03 ADJUSTING
A. Adjust work under provisions of Section 017000 - Execution and Closeout Requirements.
B. Adjust hardware for smooth operation.
C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.04 CLEANING
A. Clean finished hardware in accordance with manufacturer’s written instructions after final adjustments have been made.
B. Clean adjacent surfaces soiled by hardware installation.
C. Replace items that cannot be cleaned to manufacturer’s level of finish quality at no additional cost.

END OF SECTION 087100
SECTION 088000 - GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Insulating glass units.
   B. Glazing units.

1.02 RELATED REQUIREMENTS
   A. Section 079200 - Joint Sealants: Sealants for other than glazing purposes.
   B. Section 081113 - Hollow Metal Doors and Frames: Glazed lites in doors.
   C. Section 081416 - Flush Wood Doors: Glazed lites in doors.
   D. Section 084313 - Aluminum-Framed Storefronts: Glazing furnished as part of storefront assembly.
   E. Section 088300 - Mirrors.
   F. Section 102800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data on Insulating Glass Unit and Glazing Unit Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.
   C. Samples: Submit two samples 8 by 8 inch (203.2 by 203.2 mm) in size of glass units.
   D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 WARRANTY
   A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
   B. Insulating Glass Units: Provide a five (5) year manufacturer warranty to include coverage for seal failure, interpane dusting or misting, including providing products to replace failed units.
   C. Laminated Glass: Provide a five (5) year manufacturer warranty to include coverage for delamination, including providing products to replace failed units.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Glass Fabricators:
       1. GGI - General Glass International: www.generalglass.com/#sle.

B. Float Glass Manufacturers:
5. Vitro Architectural Glass (formerly PPG Glass); _____: www.vitroglazings.com/#sle.

C. Laminated Glass Manufacturers:

2.02 GLASS MATERIALS
A. Float Glass: Provide float glass based glazing unless noted otherwise.
   1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.
   2. Heat-Strengthened and Fully Tempered Types: ASTM C1048, Kind HS and FT.

2.03 INSULATING GLASS UNITS
A. Insulating Glass Units: Types as indicated.
   1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
   2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
   4. Edge Seal:
      a. Dual-Sealed System: Provide polyisobutylene sealant as primary seal applied between spacer and glass panes, and silicone, polysulfide, or polyurethane sealant as secondary seal applied around perimeter.
   5. Color: Black.
   6. Purge interpane space with dry air, hermetically sealed.

2.04 GLAZING UNITS
A. Type G-14 - Direct to Glass Ceramic Printing: Ceramic frit is fused into glass creating permanent designs.
   1. Applications: Locations as indicated on drawings.
   2. Glass Type: Fully tempered; monolithic glass system.

END OF SECTION 088000
SECTION 088300 - MIRRORS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Glass mirrors.
      1. Tempered safety glass.

1.02 REFERENCE STANDARDS
   C. GANA (TIPS) - Mirrors: Handle with Extreme Care (Tips for the Professional on the Care and Handling of Mirrors); 2011.

PART 2 PRODUCTS

2.01 MATERIALS
   A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.
   B. Mirror Glass: Type M1: ASTM C1036, Type 1 - Transparent Flat, Class 1 - Clear, Quality - Q1 (high-quality mirrors); silvering, protective coating, and quality requirements in compliance with ASTM C1503.
      1. Thickness: 1/4 inch (6 mm).
      2. Size: As noted on drawings.

2.02 ACCESSORIES
   A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness.
   B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness.
   C. Channel Frame: One piece, channel frame, stainless steel, Type 430, satin finish, 1/2 inch by 1/2 inch by 3/8 inch deep (12.7 mm by 12.7 mm by 9.5 mm deep) with 90 degree mitered corners.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install mirrors in accordance with GANA (TIPS) and manufacturers recommendations.
   B. Set mirrors plumb and level, and free of optical distortion.
   C. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

3.02 CLEANING
   A. Remove labels after work is complete.
   B. Clean mirrors and adjacent surfaces.

END OF SECTION 088300
PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Metal stud wall framing.
C. Metal channel ceiling framing.
D. Acoustic insulation.
E. Cementitious backing board.
F. Gypsum wallboard.
G. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 054000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
B. Section 061000 - Rough Carpentry: Building framing and sheathing.
C. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.
D. Section 072100 - Thermal Insulation: Acoustic insulation.

1.03 REFERENCE STANDARDS

A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2012.
J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.
T. ASTM E413 - Classification for Rating Sound Insulation; 2016.

1.04 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer’s data on partition head to structure connectors, showing compliance with requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES
A. Provide completed assemblies complying with ASTM C840 and GA-216.
B. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
   1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft (0.24 kPa) with maximum mid-span deflection of L/240.
   2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
C. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.

2.02 METAL FRAMING MATERIALS
A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C-shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
B. Loadbearing Studs for Application of Gypsum Board: As specified in Section 054000.
C. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
D. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Deflection and Firestop Track:
      a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
      b. Products:
         1) FireTrak Corporation; Posi Klip.
         2) Metal-Lite, Inc; The System.
2.03 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
   3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Thickness:
      a. Vertical Surfaces: 5/8 inch (16 mm).
      b. Ceilings: 5/8 inch (16 mm).
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   5. Paper-Faced Products:
      b. American Gypsum Company; FireBloc Type X Gypsum Wallboard.
      c. American Gypsum Company; FireBloc Type C Gypsum Wallboard.
      d. Continental Building Products; Firecheck Type C.
      e. Continental Building Products; Firecheck Type X.
      f. Continental Building Products; LiftLite.
      g. Continental Building Products; LiftLite Firecheck 30.
      h. Continental Building Products; Regular Drywall.
      i. Georgia-Pacific Gypsum; ToughRock.
      j. Georgia-Pacific Gypsum; ToughRock Fireguard X.
      k. Georgia-Pacific Gypsum; ToughRock Fireguard C.
      l. National Gypsum Company; Gold Bond BRAND Fire-Shield Gypsum Board.
      m. National Gypsum Company; Gold Bond 3/4" Ultra-Shield FS Gypsum Board.
      n. Substitutions: See Section 016000 - Product Requirements.
   6. Mold Resistant Paper Faced Products:
      a. American Gypsum Company; M-Bloc.
      b. American Gypsum Company; M-Bloc Type X.
      c. American Gypsum Company; M-Bloc Type C.
      d. Continental Building Products; Mold Defense.
      e. Continental Building Products; Mold Defense Type X.
      f. Georgia-Pacific Gypsum; ToughRock Mold-Guard.
      g. Georgia-Pacific Gypsum; ToughRock Fireguard X Mold-Guard.
      h. National Gypsum Company; Gold Bond XP Gypsum Board.
      i. National Gypsum Company; Gold Bond 3/4" Ultra-Shield FS XP Gypsum Board.
   7. Glass Mat Faced Products:
      b. Continental Building Products; Weather Defense Platinum Interior Type X.
      c. Georgia-Pacific Gypsum; DensArmor Plus.
      d. Georgia-Pacific Gypsum; DensArmor Plus Fireguard C.
      e. National Gypsum Company; Gold Bond eXP Interior Extreme Gypsum Panel.
      f. National Gypsum Company; Gold Bond eXP Fire-Shield Interior Extreme Gypsum Panel.
      g. USG Corporation; USG Sheetrock Brand Glass-Mat Panels Mold Tough.

B. Backing Board For Wet Areas: One of the following products:
   1. Application: Surfaces behind tile in wet areas including.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
      a. Thickness: 5/8 inch (15.88 mm).
4. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
5. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
   a. Standard Type: Thickness 5/8 inch (15.88 mm).

2.04 ACCESSORIES
A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Thickness: _____ inch (_____ mm).
B. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
D. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
E. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION
A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
   1. Install studs at spacing required to meet performance requirements.
B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.

3.03 FRAMING INSTALLATION
A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
C. Studs: Space studs as indicated.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
E. Blocking: Install wood blocking for support of:
   1. Wall mounted cabinets.
   2. Plumbing fixtures.
   3. Toilet partitions.
   4. Toilet accessories.
   5. Wall mounted door hardware.
3.04 ACOUSTIC ACCESSORIES INSTALLATION
   A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

3.05 BOARD INSTALLATION
   A. Comply with ASTM C840, GA-216, and manufacturer’s instructions. Install to minimize butt end joints, especially in highly visible locations.
   B. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
   C. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
   D. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer’s instructions.

3.06 INSTALLATION OF TRIM AND ACCESSORIES
   A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
      1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
   B. Corner Beads: Install at external corners, using longest practical lengths.
   C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.07 JOINT TREATMENT
   A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
      1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
      2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
      3. Level 3: Walls to receive textured wall finish.
      4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
      5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
   B. 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 (0.8 mm).
   C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.08 TOLERANCES
   A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION 092116
SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1  GENERAL

1.01  SECTION INCLUDES
A.  Metal partition, ceiling, and soffit framing.
B.  Framing accessories.

1.02  RELATED REQUIREMENTS
A.  Section 054000 - Cold-Formed Metal Framing: Structural load bearing metal stud framing and Exterior wall stud framing.
B.  Section 061000 - Rough Carpentry: Wood blocking within stud framing.
C.  Section 072100 - Thermal Insulation: Insulation.
D.  Section 092116 - Gypsum Board Assemblies: Metal studs for gypsum board partition framing.

1.03  REFERENCE STANDARDS

1.04  QUALITY ASSURANCE
A.  Installer Qualifications: Company specializing in performing the work of this section with minimum five years documented experience.

PART 2  PRODUCTS

2.01  FRAMING MATERIALS
A.  Fire Rated Assemblies: Comply with applicable code and as indicated on drawings.
B.  Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 7.5 psf (L/240 at 360 Pa).
   1.  Studs: C shaped with flat or formed webs with knurled faces.
   2.  Runners: U shaped, sized to match studs.
   3.  Ceiling Channels: C shaped.
   4.  Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
C.  Loadbearing Studs: As specified in Section 054000.
D.  Acoustic Insulation: As specified in Section 072100.

PART 3  EXECUTION

3.01  INSTALLATION OF STUD FRAMING
A.  Comply with requirements of ASTM C754.
B.  Extend partition framing to structure where indicated and to ceiling in other locations.
C.  Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer’s instructions.
D.  Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer’s instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
E.  Align and secure top and bottom runners at 24 inches (600 mm) on center.
F.  Fit runners under and above openings; secure intermediate studs to same spacing as wall studs.
G.  Align stud web openings horizontally.
H. Secure studs to tracks using fastener method. Do not weld.
I. Fabricate corners using a minimum of three studs.
J. Double stud at wall openings, door and window jambs, not more than 2 inches (50 mm) from each side of openings.
K. Brace stud framing system rigid.
L. Coordinate erection of studs with requirements of door frames; install supports and attachments.
M. Coordinate installation of bucks, anchors, and blocking with electrical, mechanical, and other work to be placed within or behind stud framing.
N. Blocking: Use wood blocking secured to studs. Provide blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, hardware, and opening frames.
O. Furring: Install at spacing and locations shown on drawings. Lap splices a minimum of 6 inches (150 mm).

3.02 CEILING AND SOFFIT FRAMING
A. Comply with requirements of ASTM C754.
B. Install furring after work above ceiling or soffit is complete. Coordinate the location of hangers with other work.
C. Install furring independent of walls, columns, and above-ceiling work.
D. Securely anchor hangers to structural members or embed in structural slab. Space hangers as required to limit deflection to criteria indicated.
E. Space main carrying channels at maximum 72 inch (1800 mm) on center, and not more than 6 inches (150 mm) from wall surfaces. Lap splice securely.
F. Securely fix carrying channels to hangers to prevent turning or twisting and to transmit full load to hangers.
G. Place furring channels perpendicular to carrying channels, not more than 2 inches (50 mm) from perimeter walls, and rigidly secure. Lap splices securely.

END OF SECTION 092216
SECTION 095100 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Suspended metal grid ceiling system.
B. Acoustical units.

1.02 REFERENCE STANDARDS
D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

1.03 ADMINISTRATIVE REQUIREMENTS
A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.
B. Do not install acoustical units until after interior wet work is dry.

1.04 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on suspension system components and acoustical units.
C. Samples: Submit two samples 6 by 6 inch (152.4 by 152.4 mm) in size illustrating material and finish of acoustical units.
D. Samples: Submit two samples each, 12 inches (304.8 mm) long, of suspension system main runner.
E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Acoustic Tiles/Panels:
   4. USG; www.usg.com/#sle.
B. Suspension Systems:
   1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS
A. Acoustical Panels: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. Size: 12 by 24 inches (300 by 600 mm).
   2. Thickness: 3/4 inches (19 mm).
   5. Suspension System: Exposed grid.
2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

B. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch (24 mm) wide face.
   2. Construction: Double web.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

D. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

E. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

G. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.

H. Do not eccentrically load system or induce rotation of runners.

I. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.
G. Where round obstructions occur, provide preformed closures to match perimeter molding.
H. Install hold-down clips on panels within 20 ft (6 m) of an exterior door.

END OF SECTION 095100
PART 1  GENERAL

1.01  SECTION INCLUDES

A. Surface preparation.
B. Field application of paints, stains, and varnishes.
C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, zinc, and lead.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically indicated.
   8. Ceramic and other types of tiles.
   9. Glass.
   10. Concealed pipes, ducts, and conduits.

1.02  RELATED REQUIREMENTS

A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 055000 - Metal Fabrications: Shop-primed items.
C. Section 099123 - Interior Painting.

1.03  REFERENCE STANDARDS

C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).
D. SSPC-SP 2 - Hand Tool Cleaning; 2018.
E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.
F. SSPC-SP 13 - Surface Preparation of Concrete; 1997 (Reaffirmed 2003).

1.04  SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
   4. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Allow 30 days for approval process, after receipt of complete samples by Architect.
D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
   1. Substitution of MPI-approved products by a different manufacturer is preferred over substitution of unapproved products by the same manufacturer.
   2. Substitution of a different paint system using MPI-approved products by the same manufacturer will be considered.
B. Paints:
C. Transparent Finishes:
D. Stains:
E. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL
A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
3. Supply each paint material in quantity required to complete entire project's work from a single production run.
4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.

2.03 PAINT SYSTEMS - EXTERIOR
1. One top coat and one coat primer.
2. Top Coat(s): Exterior Latex; MPI #10, 11, 15, 119, or 214.
3. Top Coat Sheen:
   a. Velvet: MPI gloss level 2; use this sheen at all locations.
4. Primer: As recommended by top coat manufacturer for specific substrate.
B. Paint E-Pav - Pavement Marking Paint:
   1. Yellow: One coat, with reflective particles; ________.
   2. White: One coat, with reflective particles; ________.

2.04 ACCESSORY MATERIALS
A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.
B. Patching Material: Latex filler.
C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION
A. Do not begin application of paints and finishes until substrates have been properly prepared.
B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
D. Test shop-applied primer for compatibility with subsequent cover materials.
E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   2. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   3. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION
A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.
D. Seal surfaces that might cause bleed through or staining of topcoat.
E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
F. Concrete:
   1. Clean surfaces with pressurized water. Allow to dry.
2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

G. Masonry:
1. Prepare surface as recommended by top coat manufacturer.
2. Clean surfaces with pressurized water. Allow to dry.

H. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

I. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

J. Galvanized Surfaces:
1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
2. Prepare surface according to SSPC-SP 2.

K. Ferrous Metal:
1. Solvent clean according to SSPC-SP 1.
3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

L. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

M. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION
A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply additional coats until complete hide is achieved.

F. Sand wood and metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

H. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING
A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION
A. Touch-up damaged finishes after Substantial Completion.
3.07 COLOR SCHEDULE

END OF SECTION 099113
SECTION 099123 - INTERIOR PAINTING

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, and varnishes.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Mechanical and Electrical:
      a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
      b. In finished areas, paint shop-primed items.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Stainless steel, anodized aluminum, bronze, terne coated stainless steel, and lead items.
   6. Marble, granite, slate, and other natural stones.
   7. Floors, unless specifically indicated.
   8. Ceramic and other tiles.
   9. Glass.
   10. Acoustical materials, unless specifically indicated.
   11. Concealed pipes, ducts, and conduits.

1.02  RELATED REQUIREMENTS

A. Section 016116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 055000 - Metal Fabrications: Shop-primed items.

C. Section 099113 - Exterior Painting.

1.03  REFERENCE STANDARDS


C. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

D. SSPC-SP 2 - Hand Tool Cleaning; 2018.

E. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

F. SSPC-SP 13 - Surface Preparation of Concrete; 1997 (Reaffirmed 2003).

1.04  SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
4. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.
   2. Allow 30 days for approval process, after receipt of complete samples by Architect.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 016000 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gallon (4 L) of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
   1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for submittals.
   2. Substitution of MPI-approved products by a different manufacturer is preferred over substitution of unapproved products by the same manufacturer.
   3. Substitution of a different paint system using MPI-approved products by the same manufacturer will be considered.

B. Paints:

C. Transparent Finishes:
   2. PPG Paints Deft Interior Clears/Polyurethanes: www.ppgpaints.com/#sle.

D. Stains:

E. Primer Sealers: Same manufacturer as top coats.

F. Substitutions: See Section 016000 - Product Requirements.
2.02 PAINTS AND FINISHES - GENERAL
   A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
      1. Provide paints and finishes of a soft paste consistency, capable of being readily and
         uniformly dispersed to a homogeneous coating, with good flow and brushing properties,
         and capable of drying or curing free of streaks or sags.
      2. Provide materials that are compatible with one another and the substrates indicated under
         conditions of service and application, as demonstrated by manufacturer based on testing
         and field experience.
      3. Supply each paint material in quantity required to complete entire project's work from a
         single production run.
      4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is
         specifically described in manufacturer's product instructions.
   B. Volatile Organic Compound (VOC) Content: Comply with Section 016116.

2.03 PAINT SYSTEMS - INTERIOR
   A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum
      board, concrete, concrete masonry units, wood, uncoated steel, shop primed steel, galvanized
      steel, and aluminum.
      1. Two top coats and one coat primer.
      2. Top Coat(s): High Performance Architectural Interior Latex; MPI #138, 139, 140, or 141.
      3. Top Coat Sheen:
         a. Flat: MPI gloss level 1; use this sheen for ceilings and other overhead surfaces.
         b. Satin: MPI gloss level 4; use this sheen for items subject to frequent touching by
            occupants, including door frames and railings.
      4. Primer: As recommended by top coat manufacturer for specific substrate.
   B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by
      occupants, including metals and wood:
      1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and
         balustrades.
      2. Two top coats and one coat primer.
      3. Top Coat(s): High Performance Architectural Interior Latex; MPI #139, 140, or 141.
      4. Top Coat Sheen:
         a. Satin: MPI gloss level 4; use this sheen at all locations.
      5. Primer: As recommended by top coat manufacturer for specific substrate.
   C. Paint I-OP-FL - Concrete Floors to be Painted.
      1. Two top coats and one coat primer.
      2. Top Coat(s): Alkyd Floor Enamel, Gloss; MPI #27.
      3. Top Coat Sheen:
         a. Gloss: MPI gloss level 6; use this sheen at all locations.
      4. Primer: As recommended by top coat manufacturer for specific substrate.
   D. Paint I-TR-W - Transparent Finish on Wood.
      1. 1 top coat over sanding sealer over stain.
      2. Top Coat(s): Polyurethane Varnish, Oil Modified; MPI #56 or 57.
      3. Top Coat Sheen:
         a. Gloss: MPI gloss level 6; use this sheen at all locations.

2.04 ACCESSORY MATERIALS
   A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding
      materials, and clean-up materials as required for final completion of painted surfaces.
   B. Patching Material: Latex filler.
   C. Fastener Head Cover Material: Latex filler.
PART 3  EXECUTION

3.01  EXAMINATION
A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
C. Test shop-applied primer for compatibility with subsequent cover materials.
D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   4. Concrete Floors and Traffic Surfaces: 8 percent.

3.02  PREPARATION
A. Clean surfaces thoroughly and correct defects prior to application.
B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
C. Remove or repair existing paints or finishes that exhibit surface defects.
D. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
E. Seal surfaces that might cause bleed through or staining of topcoat.
F. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
G. Concrete:
   1. Clean surfaces with pressurized water. Allow to dry.
   2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.
H. Masonry:
   1. Prepare surface as recommended by top coat manufacturer.
   2. Clean surfaces with pressurized water. Allow to dry.
I. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
J. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
K. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
L. Galvanized Surfaces:
   1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.
   2. Prepare surface according to SSPC-SP 2.
M. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.
N. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
O. Wood Surfaces to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

P. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with tinted primer.

Q. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Sand wood and metal surfaces lightly between coats to achieve required finish.

G. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

H. Wood to Receive Transparent Finishes: Tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION 099123
SECTION 102600 - WALL AND DOOR PROTECTION

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Corner guards.

1.02 RELATED REQUIREMENTS
   A. Section 055000 - Metal Fabrications: Corner guards fabricated from rolled metal sections or bent plate.

PART 2 PRODUCTS
2.01 PRODUCT TYPES
   A. Corner Guards - Surface Mounted:
      1. Corner guards fabricated from rolled section or bent plate are specified in Section 055000.
      3. Material: Type 304 stainless steel, No. 4 finish, 16 gage, 0.0625 inch (1.59 mm) thick.
      4. Width of Wings: 2 inches (51 mm).
      5. Corner: Square.
      6. Color: As selected from manufacturer's standard colors.
      7. Length: One piece.

2.02 FABRICATION
   A. Fabricate components with tight joints, corners and seams.

PART 3 EXECUTION
3.01 INSTALLATION
   A. Position corner guard 4 inches (102 mm) above finished floor to 36 inches high (914.4 mm high).

END OF SECTION 102600
SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Commercial toilet accessories.
   B. Under-lavatory pipe supply covers.

1.02 RELATED REQUIREMENTS
   A. Section 088300 - Mirrors: Other mirrors.

1.03 REFERENCE STANDARDS

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordinate the work with the placement of internal wall reinforcement to receive anchor attachments.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Commercial Toilet, Shower, and Bath Accessories:

2.02 FINISHES
   A. Stainless Steel: Satin finish, unless otherwise noted.

2.03 COMMERCIAL TOILET ACCESSORIES
      1. Products:
   B. Paper Towel Dispenser: Folded paper type, stainless steel, surface-mounted, with viewing slots on sides as refill indicator.
      1. Capacity: 300 C-fold minimum.
      2. Products:
   C. Waste Receptacle: Recessed, stainless steel.
      1. Products:
D. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gage refill indicator, tumbler lock.
   1. Products:

E. Air Freshener Dispenser: Wall-mounted, battery operated.
   1. Products:

F. Seat Cover Dispenser: Stainless steel, surface-mounted, reloading by concealed opening at base.
   2. Products:

G. Grab Bars: Stainless steel, smooth surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.
      b. Dimensions: 1-1/2 inch (38 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, concealed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
      c. Finish: Satin.
      d. Length and Configuration: As indicated on drawings.
      e. Products:
         1) Bradley Corporation: Model 812 Series Grab Bars 1 1/2" with Concealed Mounting.
         2) American Specialties, Inc.: Model 3800 Series 1-1/2" Dia. – Snap Flange Grab Bars.

H. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
   1. Products:

2.04 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
   1. Insulate exposed drainage piping including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
   2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
   3. Construction: 1/8 inch (3.2 mm) flexible PVC.
      a. Comply with ASTM C1822, type indicated.
   5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.
   6. Products:
      a. Plumberex Specialty Products, Inc; Plumberex Handy-Shield Maxx: www.plumberex.com/#sle.
      b. Plumberex Specialty Products, Inc; Plumberex Trap Gear: www.plumberex.com/#sle.
PART 3 EXECUTION

3.01 PREPARATION
   A. Deliver inserts and rough-in frames to site for timely installation.
   B. Provide templates and rough-in measurements as required.

3.02 INSTALLATION
   A. Install accessories in accordance with manufacturers’ instructions in locations indicated on drawings.
   B. Install plumb and level, securely and rigidly anchored to substrate.
   C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.
      1. Grab Bars: As indicated on drawings.
      2. Other Accessories: As indicated on drawings.

END OF SECTION 102800
SECTION 220516 - EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 REFERENCE STANDARDS
   A. UL (DIR) - Online Certifications Directory; Current Edition.

1.02 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data:
      1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot (meter) and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS
   A. Comply with UL (DIR) requirements.

2.02 FLEXIBLE PIPE CONNECTORS - STEEL PIPING
   A. Inner Hose: Carbon steel.
   C. Pressure Rating: 125 psi and 450 degrees F (862 kPa and 232 degrees C).
   D. Size: Use pipe sized units.
   E. Maximum offset: 3/4 inch (20 mm) on each side of installed center line.

2.03 FLEXIBLE PIPE CONNECTORS - COPPER PIPING
   A. Inner Hose: Bronze.
   B. Exterior Sleeve: Braided bronze.
   C. Pressure Rating: 125 psi and 450 degrees F (862 kPa and 232 degrees C).
   D. Size: Use pipe sized units.
   E. Maximum offset: 3/4 inch (20 mm) on each side of installed center line.
   F. Application: Copper piping.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install in accordance with manufacturer’s instructions.
   B. Install flexible pipe connectors on pipes connected to vibration isolated equipment. Provide line size flexible connectors.
   C. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.

END OF SECTION 220516
SECTION 220517 - SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

1.02 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

1.03 WARRANTY
A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 PIPE SLEEVES
A. Vertical Piping:
   1. Sleeve Length: 1 inch (25 mm) above finished floor.
   2. Provide sealant for watertight joint.
B. Plastic or Sheet Metal: Pipe passing through interior walls, partitions, and floors, unless steel or brass sleeves are specified below.
C. Clearances:
   1. Provide allowance for insulated piping.
   2. Wall, Floor, Floor, Partitions, and Beam Flanges: 1 inch (25 mm) greater than external; pipe diameter.
   3. All Rated Openings: Caulked tight with fire stopping material complying with ASTM E814 in accordance with Section 078400 to prevent the spread of fire, smoke, and gases.

2.02 MANUFACTURED SLEEVE-SEAL SYSTEMS
A. Modular/Mechanical Seal:
   1. Synthetic rubber interlocking links continuously fill annular space between pipe and wall/casing opening.
   2. Provide watertight seal between pipe and wall/casing opening.
   3. Elastomer element size and material in accordance with manufacturer's recommendations.
   4. Glass reinforced plastic pressure end plates.

PART 3 EXECUTION

3.01 INSTALLATION
A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.
B. Install piping to conserve building space, to not interfere with use of space and other work.
C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
D. Structural Considerations:
   1. Do not penetrate building structural members unless indicated.
E. Provide sleeves when penetrating footings, floors, walls, partitions, and ________. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.
F. Manufactured Sleeve-Seal Systems:
   1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
3. Locate piping in center of sleeve or penetration.
4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
5. Tighten bolting for a water-tight seal.
6. Install in accordance with manufacturer's recommendations.

G. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

END OF SECTION 220517
SECTION 220519 - METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASME B40.100 - Pressure Gauges and Gauge Attachments; 2013.
D. UL 393 - Indicating Pressure Gauges for Fire-Protection Service; Current Edition, Including All Revisions.

1.02 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide list that indicates use, operating range, total range and location for manufactured components.

PART 2 PRODUCTS

2.01 PRESSURE GAUGES

A. Pressure Gauges: ASME B40.100, UL 393 drawn steel case, phosphor bronze bourdon tube, rotary brass movement, brass socket, with front recalibration adjustment, black scale on white background.
   1. Case: Steel with brass bourdon tube.
   2. Size: 4-1/2 inch (115 mm) diameter.
   3. Mid-Scale Accuracy: One percent.

2.02 PRESSURE GAUGE TAPPINGS

A. Gauge Cock: Tee or lever handle, brass for maximum 150 psi (1034 kPa).
B. Needle Valve: Brass, 1/4 inch (6 mm) NPT for minimum 150 psi (1034 kPa).

2.03 STEM TYPE THERMOMETERS

A. Thermometers - Adjustable Angle: Red- or blue-appearing non-toxic liquid in glass; ASTM E1; lens front tube, cast aluminum case with enamel finish, cast aluminum adjustable joint with positive locking device; adjustable 360 degrees in horizontal plane, 180 degrees in vertical plane.
   1. Size: 9 inch (225 mm) scale.
   2. Window: Clear Lexan.
   3. Accuracy: 2 percent, per ASTM E77.
   4. Calibration: Degrees F.

2.04 THERMOMETER SUPPORTS

A. Socket: Brass separable sockets for thermometer stems with or without extensions as required, and with cap and chain.

2.05 TEST PLUGS

A. Test Plug: 1/4 inch (6 mm) or 1/2 inch (13 mm) brass fitting and cap for receiving 1/8 inch (3 mm) outside diameter pressure or temperature probe with neoprene core for temperatures up to 200 degrees F (93 degrees C).

2.06 STATIC PRESSURE GAUGES

A. 3-1/2 inch (90 mm) diameter dial in metal case, diaphragm actuated, black figures on white background, front recalibration adjustment, 2 percent of full scale accuracy.
PART 3 EXECUTION

3.01 INSTALLATION

A. Install pressure gauges with pulsation dampers. Provide gauge cock to isolate each gauge. Extend nipples and siphons to allow clearance from insulation.

B. Install thermometers in piping systems in sockets in short couplings. Enlarge pipes smaller than 2-1/2 inch (60 mm) for installation of thermometer sockets. Ensure sockets allow clearance from insulation.

C. Install gauges and thermometers in locations where they are easily read from normal operating level. Install vertical to 45 degrees off vertical.

END OF SECTION 220519
SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 REFERENCE STANDARDS
   A. ASME B1.20.1 - Pipe Threads, General Purpose (Inch); 2013 (Reaffirmed 2018).
   B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2018.
   D. MSS SP-45 - Bypass and Drain Connections; 2003 (Reaffirmed 2008).
   E. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.
   F. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.

1.02 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

PART 2 PRODUCTS

2.01 APPLICATIONS
   A. See drawings for specific valve locations.
   B. Provide the following valves for the applications if not indicated on drawings:
      1. Shutoff: Ball, butterfly, _____.
      2. Throttling: Provide globe, ball, or butterfly.
      3. Swing Check (Pump Outlet):
         a. 2 NPS (50 DN) and Smaller: Bronze swing check valves with bronze disc.
   C. Substitutions of valves with higher CWP classes or SWP ratings for same valve types are permitted when specified CWP ratings or SWP classes are not available.
   D. Domestic, Hot and Cold Water Valves:
      1. 2 NPS (50 DN) and Smaller:
         a. Bronze: Provide with solder-joint or threaded ends.
         b. Ball: One piece, full port, bronze with stainless-steel trim.
         c. Bronze Swing Check: Class 125, bronze disc.

2.02 GENERAL REQUIREMENTS
   A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.
   B. Valve Sizes: Match upstream piping unless otherwise indicated.
   C. Valve Actuator Types:
      1. Hand Lever: Quarter-turn valves 6 NPS (150 DN) and smaller except plug valves.
   D. Valve-End Connections:
   E. General ASME Compliance:
   G. Bronze Valves:
      1. Fabricate from dezincification resistant material.
      2. Copper alloys containing more than 15 percent zinc are not permitted.
H. Valve Bypass and Drain Connections: MSS SP-45.
I. Source Limitations: Obtain each valve type from a single manufacturer.

2.03 BRONZE BALL VALVES
A. Two Piece, Full Port with Bronze Trim:
   1. Comply with MSS SP-110.
   2. SWP Rating: 150 psig (1035 kPa).
   3. CWP Rating: 600 psig (4140 kPa).
   5. Ends: Threaded.
   6. Seats: PTFE.
   7. Stem: Bronze.
   8. Ball: Chrome plated brass.

2.04 BRONZE SWING CHECK VALVES
A. Class 125: CWP Rating: 200 psig (1380 kPa).
   1. Comply with MSS SP-80, Type 3.
   2. Design: Horizontal flow.
   4. Ends: Threaded as indicated.
   5. Disc: Bronze.

PART 3 EXECUTION
3.01 INSTALLATION
A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.
B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.
C. Install check valves where necessary to maintain direction of flow as follows:
   1. Swing Check: Install horizontal maintaining hinge pin level.

END OF SECTION 220523
SECTION 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 2 PRODUCTS

1.01 IDENTIFICATION APPLICATIONS
   A. Piping: Pipe markers.
   B. Small-sized Equipment: Tags.

1.02 TAGS
   A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch (40 mm) diameter.
   B. Valve Tag Chart: Typewritten letter size list in anodized aluminum frame.

1.03 PIPE MARKERS
   A. Comply with ASME A13.1.
   B. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and identification of fluid being conveyed.
   C. Color code as follows:
      1. Potable, Cooling, Boiler, Feed, Other Water: Green with white letters.
      2. Flammable Fluids: Yellow with black letters.

PART 3 EXECUTION

2.01 INSTALLATION
   A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.
   B. Install tags with corrosion resistant chain.
   C. Install plastic pipe markers in accordance with manufacturer's instructions.
   D. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

END OF SECTION 220553
SECTION 220719 - PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 REFERENCE STANDARDS

B. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

1.02 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER

A. Insulation: ASTM C547 and ASTM C795; rigid molded, noncombustible.
   1. K (Ksi) Value: ASTM C177, 0.24 at 75 degrees F (0.035 at 24 degrees C).
   3. Maximum Moisture Absorption: 0.2 percent by volume.
B. Vapor Barrier Jacket: White Kraft paper with glass fiber yarn, bonded to aluminized film; moisture vapor transmission when tested in accordance with ASTM E96/E96M of 0.02 perm-inches (0.029 ng/Pa s m).
C. Vapor Barrier Lap Adhesive: Compatible with insulation.

2.03 JACKETS

A. PVC Plastic.
   1. Jacket: One piece molded type fitting covers and sheet material, off-white color.
      a. Minimum Service Temperature: 0 degrees F (Minus 18 degrees C).
      b. Maximum Service Temperature: 150 degrees F (66 degrees C).
      c. Moisture Vapor Permeability: 0.002 perm inch (0.0029 ng/Pa s m), maximum, when tested in accordance with ASTM E96/E96M.
      d. Thickness: 10 mil (0.25 mm).
      e. Connections: Brush on welding adhesive.
   1. Thickness: 0.016 inch (0.40 mm) sheet.
   2. Finish: Smooth.
   3. Joining: Longitudinal slip joints and 2 inch (50 mm) laps.
4. Fittings: 0.016 inch (0.4 mm) thick die shaped fitting covers with factory attached protective liner.
5. Metal Jacket Bands: 3/8 inch (10 mm) wide; 0.010 inch (0.25 mm) thick stainless steel.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.
B. Exposed Piping: Locate insulation and cover seams in least visible locations.
C. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.
D. Glass fiber insulated pipes conveying fluids below ambient temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.
E. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet (3 meters) above finished floor): Finish with PVC jacket and fitting covers.
F. Exterior Applications: Provide vapor barrier jacket. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass mesh reinforced vapor barrier cement. Cover with aluminum jacket with seams located on bottom side of horizontal piping.

END OF SECTION 220719
PART 1 GENERAL

1.01 REFERENCE STANDARDS

B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2018.
C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2018.
F. ASME B31.9 - Building Services Piping; 2017.

1.02 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.03 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.
B. Valves: Manufacturer's name and pressure rating marked on valve body.
C. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
2.02 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING
   A. Cast Iron Pipe: CISPI 301, hubless.
      1. Fittings: Cast iron.
      2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.

2.03 SANITARY SEWER PIPING, ABOVE GRADE
   A. Cast Iron Pipe: CISPI 301, hubless, service weight.
      1. Fittings: Cast iron.

2.04 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING
   A. Copper Pipe: ASTM B42, annealed.

2.05 DOMESTIC WATER PIPING, ABOVE GRADE
   A. Copper Tube: ASTM B88 (ASTM B88M), Type L (B), Drawn (H).
      1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.

2.06 STORM WATER PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING
   A. Cast Iron Pipe: CISPI 301, hubless, service weight.
      1. Fittings: Cast iron.

2.07 STORM WATER PIPING, ABOVE GRADE
   A. Cast Iron Pipe: CISPI 301, hubless, service weight.
      1. Fittings: Cast iron.

2.08 NATURAL GAS PIPING, BURIED WITHIN 5 FEET (1500 MM) OF BUILDING
   A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
      3. Jacket: AWWA C105/A21.5 polyethylene jacket or double layer, half-lapped 10 mil (0.25 mm) polyethylene tape.

2.09 NATURAL GAS PIPING, ABOVE GRADE
   A. Steel Pipe: ASTM A53/A53M Schedule 40 black.
      2. Joints: Threaded or welded to ASME B31.1.

2.10 PIPE HANGERS AND SUPPORTS
   A. Provide hangers and supports that comply with MSS SP-58.
      1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
      2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
      3. Trapeze Hangers: Welded steel channel frames attached to structure.

PART 3 EXECUTION
3.01 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

D. Install piping to maintain headroom, conserve space, and not interfere with use of space.

E. Group piping whenever practical at common elevations.

F. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

G. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.

3.02 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM
   A. Disinfect water distribution system in accordance with AWWA C651.

END OF SECTION 221005
SECTION 221006 - PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 REFERENCE STANDARDS
   A. ASSE 1011 - Performance Requirements for Hose Connection Vacuum Breakers; 2017.
   B. ASSE 1013 - Performance Requirements for Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers; 2011.

1.02 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
   A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 CLEANOUTS
   A. Cleanouts at Exterior Surfaced Areas:
      1. Round cast nickel bronze access frame and non-skid cover.
   B. Cleanouts at Exterior Unsurfaced Areas:
      1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.
   C. Cleanouts at Interior Finished Floor Areas:
      1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.
   D. Cleanouts at Interior Finished Wall Areas:
      1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

2.03 HOSE BIBBS
   A. Interior Hose Bibbs:
      1. Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated where exposed with handwheel, integral vacuum breaker in compliance with ASSE 1011.

2.04 BACKFLOW PREVENTERS
   A. Reduced Pressure Backflow Preventers:
      1. ASSE 1013; bronze body with bronze internal parts and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.
   C. Install floor cleanouts at elevation to accommodate finished floor.
D. Install approved potable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.

E. Pipe relief from backflow preventer to nearest drain.

F. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom). Fabricate same size as supply pipe or 3/4 inch (20 mm) minimum, and minimum 18 inches (450 mm) long.

END OF SECTION 221006
SECTION 223000 - PLUMBING EQUIPMENT

PART 1  GENERAL

1.01  SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittals procedures.
B. Product Data:
   1. Provide dimension drawings of water heaters indicating components and connections to
      other equipment and piping.
   2. Provide electrical characteristics and connection requirements.
C. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been
   completed in Owner's name and registered with manufacturer.

1.02  WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty for domestic water heaters.

PART 2  PRODUCTS

2.01  WATER HEATERS

A. Residential Gas Fired:
   1. Type: Automatic, natural gas-fired, vertical storage.
   2. Tank: Glass lined welded steel with single flue passage, flue baffle and draft hood;
      thermally insulated and encased in corrosion-resistant steel jacket; baked-on enamel
      finish; floor shield and legs.
      a. Insulation: Glass fiber.
   3. Controls: Automatic water thermostat and built-in gas pressure regulator; temperature
      range adjustable from 120 to 170 degrees F (49 to 77 degrees C), cast iron or sheet metal
      burner, safety pilot and thermocouple.
   4. Accessories:
      b. Dip Tube: Brass.
      c. Drain valve.
      d. Anode: Magnesium.
      e. Temperature and Pressure Relief Valve: ASME labeled.

2.02  IN-LINE CIRCULATOR PUMPS

A. Casing: Bronze, rated for 125 psig (860 kPa) working pressure.
B. Impeller: Bronze.

PART 3  EXECUTION

3.01  INSTALLATION

A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code,
   and complying with conditions of certification, if any.
B. Coordinate with plumbing piping and related fuel piping work to achieve operating system.
C. Domestic Water Storage Tanks:
   1. Provide steel pipe support, independent of building structural framing members.
   2. Clean and flush prior to delivery to site. Seal until pipe connections are made.
D. Pumps:
   1. Ensure pumps operate at specified system fluid temperatures without vapor binding and
      cavitation, are non-overloading in parallel or individual operation, and operate within 25
      percent of midpoint of published maximum efficiency curve.

END OF SECTION 223000
PART 1 GENERAL

1.01 REFERENCE STANDARDS
C. ASME A112.18.1 - Plumbing Supply Fittings; 2018.
D. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2018.
E. ASME A112.19.3 - Stainless Steel Plumbing Fixtures; 2017.
H. UL (DIR) - Online Certifications Directory; Current Edition.

1.02 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide catalog illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS
A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.
B. Water Efficiency: EPA WaterSense label is required for all water closets, urinals, lavatory faucets, and showerheads.

2.02 REGULATORY REQUIREMENTS
A. Comply with applicable codes for installation of plumbing systems.
B. Comply with UL (DIR) requirements.
C. Perform work in accordance with local health department regulations.
D. Provide certificate of compliance from Authority Having Jurisdiction indicating approval of installation.

2.03 FLUSH VALVE WATER CLOSETS
   1. Flush Valve: Exposed (top spud).
   3. Handle Height: 44 inches (1117 mm) or less.
B. Flush Valves: ASME A112.18.1, diaphragm type, complete with vacuum breaker stops and accessories.
   1. Sensor-Operated Type: Solenoid or motor-driven operator, low voltage hard-wired, infrared sensor with mechanical over-ride or over-ride push button.
   2. Exposed Type: Chrome plated, escutcheon, integral screwdriver stop.
C. Seats:
   1. Solid white plastic, open front, extended back, self-sustaining hinge, brass bolts, with cover.

2.04 WALL HUNG URINALS
   1. Flush Volume: 1.0 gallons (3.7 liters), maximum.
2. Flush Valve: Exposed (top spud).
4. Trap: Integral.

B. Flush Valves: ASME A112.18.1, diaphragm type, complete with vacuum breaker stops and accessories.
   1. Sensor-Operated Type: Solenoid or motor-driven operator, low voltage hard-wired, infrared sensor with mechanical over-ride or over-ride push button.
   2. Exposed Type: Chrome plated, escutcheon, integral screwdriver stop.

2.05 LAVATORIES

A. Vitreous China Counter Top Basin: ASME A112.19.2; vitreous china self-rimming counter top lavatory, ______ with drillings on 4 inch (100 mm) centers, front overflow, soap depression, seal of putty, calking, or concealed vinyl gasket.

B. Sensor Operated Faucet: Cast brass, chrome plated, wall mounted with sensor located on neck of spout.
   2. Power Supply: Battery, easily replaceable, alkaline or lithium, minimum 200,000 cycles.
   3. Mixing Valve: None, single line for tempered water.
   5. Aerator: Vandal resistant, 0.5 GPM (1.89 LPM), laminar flow device.

2.06 SINKS

A. Single Compartment Bowl: ASME A112.19.3; _____ by _____ by _____ inch (_____ by _____ by _____ mm) outside dimensions 20 gage, 0.0359 inch (0.91 mm) thick, Type 302 stainless steel, self rimming and undercoated, with ledge back drilled for trim.
   1. Drain: 3-1/2 inch (90 mm) crumb cup and tailpiece.

2.07 BI-LEVEL, ELECTRIC WATER COOLERS

A. Water Cooler: Bi-level, electric, mechanically refrigerated; surface mounted, ADA compliant; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
   1. Capacity: 8 gallons per hour (30.3 liters per hour) of 50 degrees F (10 degrees C) water with inlet at 80 degrees F (27 degrees C) and room temperature of 90 degrees F (32 degrees C), when tested in accordance with ASHRAE Std 18.
   2. Electrical: 115 V, 60 Hertz compressor, 6 foot (2 m) cord and plug for connection to electric wiring system including grounding connector.

B. Bottle Filler: Materials to match fountain.

2.08 SERVICE SINKS

A. Bowl: 36 by 36 by 10 inch (_____ by _____ by _____ mm) high white molded stone, floor mounted, with one inch (25 mm) wide shoulders, vinyl bumper guard, stainless steel strainer.

B. Trim: ASME A112.18.1 exposed wall type supply with cross handles, spout wall brace, vacuum breaker, hose end spout, strainers, eccentric adjustable inlets, integral screwdriver stops with covering caps and adjustable threaded wall flanges.

C. Accessories:
   1. 5 feet (1.5 m) of 1/2 inch (13 mm) diameter plain end reinforced plastic hose.
   2. Hose clamp hanger.
   3. Mop hanger.

2.09 EMERGENCY EYE AND FACE WASH

A. Emergency Wash: ANSI Z358.1; wall-mounted, self-cleaning, non-clogging eye and face wash with quick opening, full-flow valves, stainless steel eye and face wash receptor, twin eye wash heads and face spray ring, stainless steel dust cover, copper alloy control valve and fittings.
PART 3  EXECUTION

3.01  INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.
B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.
C. Install components level and plumb.
D. Install and secure fixtures in place with wall supports and bolts.
E. Solidly attach water closets to floor with lag screws. Lead flashing is not intended hold fixture in place.

END OF SECTION 224000
SECTION 230513 - COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT

PART 1  GENERAL

1.01  REFERENCE STANDARDS
   A.  NEMA MG 1 - Motors and Generators; 2017.
   B.  NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.02  SUBMITTALS
   A.  See Section 013000 - Administrative Requirements for submittal procedures.
   B.  Product Data:  Provide wiring diagrams with electrical characteristics and connection requirements.

1.03  QUALITY ASSURANCE
   A.  Comply with NFPA 70.
   B.  Products Requiring Electrical Connection:  Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

PART 2  PRODUCTS

2.01  GENERAL CONSTRUCTION AND REQUIREMENTS
   A.  Construction:
      1.  Open drip-proof type except where specifically noted otherwise.
      2.  Design for continuous operation in 104 degrees F (40 degrees C) environment.
      3.  Design for temperature rise in accordance with NEMA MG 1 limits for insulation class, service factor, and motor enclosure type.
   B.  Visible Nameplate:  Indicating motor horsepower, voltage, phase, cycles, RPM, full load amps, locked rotor amps, frame size, manufacturer's name and model number, service factor, power factor, efficiency.
   C.  Wiring Terminations:
      1.  Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated.  Enclose terminal lugs in terminal box sized to NFPA 70, threaded for conduit.
      2.  For fractional horsepower motors where connection is made directly, provide threaded conduit connection in end frame.

PART 3  EXECUTION

3.01  INSTALLATION
   A.  Install in accordance with manufacturer's instructions.
   B.  Install securely on firm foundation.  Mount ball bearing motors with shaft in any position.
   C.  Check line voltage and phase and ensure agreement with nameplate.

END OF SECTION 230513
SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

2.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. TAB Agency Qualifications:
   1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.

END OF SECTION 230593
PART 2 PRODUCTS

1.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

END OF SECTION 230713
SECTION 233100 - HVAC DUCTS AND CASINGS

PART 1  GENERAL

1.01  REFERENCE STANDARDS
   C.  SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Revised 2009).

1.02  SUBMITTALS
   A.  See Section 013000 - Administrative Requirements, for submittal procedures.
   B.  Product Data:  Provide data for duct materials.
   C.  Shop Drawings:  Indicate duct fittings, particulars such as gages, sizes, welds, and configuration prior to start of work for 1/2” pressure class and higher systems.

PART 2  PRODUCTS

2.01  DUCT ASSEMBLIES
   A.  Regulatory Requirements:  Construct ductwork to comply with NFPA 90A standards.
   B.  Low Pressure Supply (Heating Systems):  1/2 inch w.g. (125 Pa) pressure class, galvanized steel.
   C.  Low Pressure Supply (System with Cooling Coils):  1/2 inch w.g. (125 Pa) pressure class, galvanized steel.

2.02  MATERIALS
   A.  Galvanized Steel for Ducts:  Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

2.03  DUCTWORK FABRICATION
   A.  Fabricate and support in accordance with SMACNA (DCS) and as indicated.
   B.  Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
   C.  Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
   D.  Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).

2.04  MANUFACTURED DUCTWORK AND FITTINGS
   A.  Spiral Ducts:  Round spiral lockseam duct with galvanized steel outer wall.
      1.  Manufacture in accordance with SMACNA (DCS).

PART 3  EXECUTION

3.01  INSTALLATION
   A.  Install, support, and seal ducts in accordance with SMACNA (DCS).
   B.  Duct sizes indicated are inside clear dimensions.  For lined ducts, maintain sizes inside lining.
   C.  Provide openings in ductwork where required to accommodate thermometers and controllers.
      Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage.  Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
   D.  Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

END OF SECTION 233100
SECTION 233300 - AIR DUCT ACCESSORIES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS
   A. Section 233100 - HVAC Ducts and Casings.

1.02 REFERENCE STANDARDS
   C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Revised 2009).

1.03 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide for shop fabricated assemblies including volume control dampers. Include electrical characteristics and connection requirements.
   C. Shop Drawings: Indicate for shop fabricated assemblies including volume control dampers.

PART 2 PRODUCTS

2.01 BACKDRAFT DAMPERS - METAL

2.02 BACKDRAFT DAMPERS - FABRIC
   A. Fabric Backdraft Dampers: Factory-fabricated.
      2. Birdscreen: 1/2 inch (12 mm) nominal mesh of galvanized steel or aluminum.
      3. Maximum Velocity: 1000 fpm (5 m/s) face velocity.

2.03 DUCT ACCESS DOORS

2.04 VOLUME CONTROL DAMPERS
   A. Fabricate in accordance with SMACNA (DCS) and as indicated.
   B. Single Blade Dampers:
      1. Fabricate for duct sizes up to 6 by 30 inch (150 by 760 mm).
      2. Blade: 24 gage, 0.0239 inch (0.61 mm), minimum.
   C. Multi-Blade Damper: Fabricate of opposed blade pattern with maximum blade sizes 8 by 72 inch (200 by 1825 mm). Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.
   D. End Bearings: Except in round ducts 12 inches (300 mm) and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon, thermoplastic elastomer, or sintered bronze bearings.
   E. Quadrants:
      1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
      2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install accessories in accordance with manufacturer’s instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 233100 for duct construction and pressure class.
   B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.
   C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as
indicated. Provide for cleaning kitchen exhaust ducts in accordance with NFPA 96. Provide minimum 8 by 8 inch (200 by 200 mm) size for hand access, size for shoulder access, and as indicated. Provide 4 by 4 inch (100 by 100 mm) for balancing dampers only. Review locations prior to fabrication.

D. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION 233300
SECTION 233416 - CENTRIFUGAL HVAC FANS

PART 1  GENERAL

1.01  REFERENCE STANDARDS

1.02  SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on centrifugal fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels for both fan inlet and outlet at rated capacity, and electrical characteristics and connection requirements.

PART 2  PRODUCTS

2.01  WHEEL AND INLET
   A. Forward Curved: Black enameled steel construction with inlet flange, back plate, shallow blades with inlet and tip curved forward in direction of airflow, mechanically secured to flange and back plate; steel hub swaged to back plate and keyed to shaft with set screw.

2.02  HOUSING
   A. Heavy gage steel, spot welded for AMCA 99 Class I and II fans, and continuously welded for Class III, adequately braced, designed to minimize turbulence with spun inlet bell and shaped cut.

PART 3  EXECUTION

3.01  INSTALLATION
   A. Install in accordance with manufacturer's instructions.

END OF SECTION 233416
SECTION 233423 - HVAC POWER VENTILATORS

PART 1 GENERAL

1.01 REFERENCE STANDARDS
A. AMCA (DIR) - (Directory of) Products Licensed Under AMCA International Certified Ratings Program; 2015.
C. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2005 (Reaffirmed 2012).
F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2014.

1.02 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 POWER VENTILATORS - GENERAL
A. Static and Dynamically Balanced: AMCA 204 - Balance Quality and Vibration Levels for Fans.
B. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
C. Sound Ratings: AMCA 301, tested to AMCA 300 and bearing AMCA Certified Sound Rating Seal.
D. Fabrication: Comply with AMCA 99.
E. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.02 ROOF EXHAUSTERS
A. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch (13 mm) mesh, 0.62 inch (1.6 mm) thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
B. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked, and line voltage motor drive, power open, spring return.
C. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Secure roof exhausters with cadmium plated steel lag screws to roof curb.
C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.

END OF SECTION 233423
SECTION 233700 - AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SUBMITTALS
   A. See Section 013000 - Administrative Requirements for submittal procedures.
   B. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.
   C. Project Record Documents: Record actual locations of air outlets and inlets.

PART 2 PRODUCTS

2.01 RECTANGULAR CEILING DIFFUSERS
   A. Type: Provide square, stamped, multi-core diffuser to discharge air in 360 degree pattern.
   B. Fabrication: Steel with baked enamel finish.

2.02 DUCT-MOUNTED SUPPLY AND RETURN REGISTERS/LOUVERS
   A. Type: Duct-mounted, rectangular register for round-spiral duct with adjustable pivot-ended blades, end caps, built-in volume damper, and dual cover flanges to lay flush on duct surface regardless of diameter. Performance to match manufacturer's catalog data.
   B. Material: 22 gage, 0.0299 inch (0.76 mm).

2.03 CEILING SUPPLY REGISTERS/GRIFFLES
   A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, one-way deflection.
   B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting and gasket.
   C. Construction: Made of aluminum extrusions with factory enamel finish.

2.04 CEILING EXHAUST AND RETURN REGISTERS/GRIFFLES
   A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with blades set at 45 degrees, vertical face.
   B. Frame: 1-1/4 inch (32 mm) margin with countersunk screw mounting.
   C. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.05 WALL SUPPLY REGISTERS/GRIFFLES
   A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille with two-way deflection.

2.06 WALL EXHAUST AND RETURN REGISTERS/GRIFFLES
   A. Type: Streamlined blades, 3/4 inch (19 mm) minimum depth, 3/4 inch (19 mm) maximum spacing, with spring or other device to set blades, vertical face.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

END OF SECTION 233700
SECTION 235100 - BREECHINGS, CHIMNEYS, AND STACKS

PART 1 GENERAL

1.01 REFERENCE STANDARDS
   C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Revised 2009).

1.02 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights, electrical characteristics and connection requirements.

PART 2 PRODUCTS

2.01 BREECHINGS, CHIMNEYS, AND STACKS - GENERAL REQUIREMENTS

2.02 TYPE B DOUBLE WALL GAS VENTS
   A. Fabrication: Inner pipe of sheet aluminum, and outer pipe of galvanized sheet steel, tested in compliance with UL 441.
   B. Electrically Actuated Vent Dampers: Same size as draft hood collar, constructed of stainless steel or galvanized steel, with corrosion-resistant components, in compliance with ANSI Z21.66.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install in accordance with NFPA 54.
   C. Support breechings from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12 foot (4 m) spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA (DCS) for equivalent duct support configuration and size.
   D. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.
   E. For Type B double wall gas vents, maintain UL listed minimum clearances from combustibles. Assemble pipe and accessories as required for complete installation.

END OF SECTION 235100
SECTION 235400 - FURNACES

PART 1  GENERAL

1.01  REFERENCE STANDARDS

1.02  SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
C. Warranty: Submit manufacturers warranty and ensure forms have been filled out in Owner’s name and registered with manufacturer.

1.03  WARRANTY
A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Provide three year manufacturers warranty for solid state ignition modules.
C. Provide five year manufacturers warranty for heat exchangers.

PART 2  PRODUCTS

2.01  GAS FIRED FURNACES
A. Annual Fuel Utilization Efficiency (AFUE): 0.95 (“condensing”).
B. Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating element, controls, air filter, humidifier, and accessories; wired for single power connection with control transformer.
   1. Safety certified by CSA in accordance with ANSI Z21.47.
C. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner. If not certified for combustible flooring, please provide additional steel base.
D. Primary Heat Exchanger:
   2. Shape: Tubular type.
E. Secondary Heat Exchanger:
   2. Shape: ____________.
F. Gas Burner:
   1. Atmospheric type with adjustable combustion air supply.
   2. Gas valve, two stage provides 100 percent safety gas shut-off; 24 volt combining pressure regulation, safety pilot, manual set (On-Off), pilot filtration, automatic electric valve.
   3. Electronic pilot ignition, with electric spark igniter.
   4. Combustion air damper with synchronous spring return damper motor.
   5. Non-corrosive combustion air blower with permanently lubricated motor.
G. Gas Burner Safety Controls:
1. Thermocouple sensor: Prevents opening of gas valve until pilot flame is proven and stops gas flow on ignition failure.
2. Flame rollout switch: Installed on burner box and prevents operation.
3. Vent safety shutoff sensor: Temperature sensor installed on draft hood and prevents operation, manual reset.
4. Limit Control: Fixed stop at maximum permissible setting, de-energizes burner on excessive bonnet temperature, automatic resets.

H. Supply Fan: Centrifugal type rubber mounted with direct drive with adjustable variable pitch motor pulley.

I. Motor:
   1. 1750 rpm single-speed, permanently lubricated, hinge mounted.

J. Air Filters: 1 inch (25 mm) thick urethane, washable type arranged for easy replacement.

K. Operating Controls:
   1. Room Thermostat: Cycles burner to maintain room temperature setting.
   2. Supply Fan Control: Energize from bonnet temperature independent of burner controls, with adjustable timed off delay and fixed timed on delay, with manual switch for continuous fan operation. Provide continuous low speed fan operation.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of authorities having jurisdiction.
B. Install in accordance with NFPA 90A.
C. Install gas fired furnaces in accordance with NFPA 54.
D. Provide vent connections in accordance with NFPA 211.

END OF SECTION 235400
PART 1 GENERAL

1.01 REFERENCE STANDARDS
   B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.

1.02 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide rated capacities, weights, accessories, electrical nameplate data, and wiring diagrams.
   C. Design Data: Indicate refrigerant pipe sizing.

PART 2 PRODUCTS

2.01 SYSTEM DESIGN
   A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
      1. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.
   B. Performance Requirements: See Drawings for additional requirements.
   C. Electrical Characteristics:
      1. _____ kW.
      2. _____ volts, single phase, 60 Hz.
      3. _____ amperes maximum fuse size.
      4. Disconnect Switch: Factory mount disconnect switch on equipment under provisions of Section 260583.

2.02 INDOOR UNITS FOR DUCTED SYSTEMS
   A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating and cooling element(s), controls, and accessories; wired for single power connection with control transformer.
      2. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
   B. Air Filters: 1 inch (25 mm) thick pleated disposable type arranged for easy replacement.
   C. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
      1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.

2.03 OUTDOOR UNITS
   A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
1. Comply with AHRI 210/240.
2. Refrigerant: R-410A.
3. Cabinet: Galvanized steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.
4. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23.1 and UL 207.

B. Compressor: Hermetic, two speed 1800 and 3600 rpm, AHRI 520 resiliently mounted integral with condenser, with positive lubrication, crankcase heater, high pressure control, motor overload protection, service valves and drier. Provide time delay control to prevent short cycling and rapid speed changes.

C. Accessories: Filter drier, high pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
   1. Provide thermostatic expansion valves.

D. Operating Controls:
   1. Control by room thermostat to maintain room temperature setting.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.

B. Install in accordance with NFPA 90A and NFPA 90B.

END OF SECTION 238126.13
SECTION 260505 - SELECTIVE DEMOLITION FOR ELECTRICAL

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Electrical demolition.

1.02 RELATED REQUIREMENTS

PART 3 EXECUTION

2.01 EXAMINATION
   A. Verify field measurements and circuiting arrangements are as indicated.
   B. Verify that abandoned wiring and equipment serve only abandoned facilities.
   C. Demolition drawings are based on casual field observation and existing record documents.
   D. Report discrepancies to Architect before disturbing existing installation.
   E. Beginning of demolition means installer accepts existing conditions.

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

2.03 DEMOLITION AND EXTENSION OF EXISTING ELECTRICAL WORK
   A. Perform work for removal and disposal of equipment and materials containing toxic substances regulated under the Federal Toxic Substances Control Act (TSCA) in accordance with applicable federal, state, and local regulations. Applicable equipment and materials include, but are not limited to:
      1. PCB- and DEHP-containing lighting ballasts.
      2. Mercury-containing lamps and tubes, including fluorescent lamps, high intensity discharge (HID), arc lamps, ultra-violet, high pressure sodium, mercury vapor, ignitron tubes, neon, and incandescent.
   B. Remove, relocate, and extend existing installations to accommodate new construction.
   C. Remove abandoned wiring to source of supply.
   D. Remove exposed abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors, and patch surfaces.
   E. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.
   F. Disconnect and remove abandoned panelboards and distribution equipment.
   G. Disconnect and remove electrical devices and equipment serving utilization equipment that has been removed.
   H. Disconnect and remove abandoned luminaires. Remove brackets, stems, hangers, and other accessories.
   I. Repair adjacent construction and finishes damaged during demolition and extension work.
   J. Maintain access to existing electrical installations that remain active. Modify installation or provide access panel as appropriate.
K. Extend existing installations using materials and methods compatible with existing electrical installations, or as specified.

2.04 CLEANING AND REPAIR

A. See Section 017419 - Construction Waste Management and Disposal for additional requirements.

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

END OF SECTION 260505
SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Single conductor building wire.
   B. Metal-clad cable.
   C. Wiring connectors.
   D. Electrical tape.
   E. Heat shrink tubing.
   F. Wire pulling lubricant.
   G. Cable ties.

1.02 RELATED REQUIREMENTS
   A. Section 078400 - Firestopping.
   B. Section 260526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.
   C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
   F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   G. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); 2012.
   J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   N. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.
   P. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.
   Q. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
1. Coordinate sizes of raceways, boxes, and equipment enclosures installed under other sections with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate with electrical equipment installed under other sections to provide terminations suitable for use with the conductors to be installed.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conductors and cables in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.
B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.
C. Metal-clad cable is permitted only as follows:
   1. Where not otherwise restricted, may be used:
      a. Where concealed above accessible ceilings for final connections from junction boxes to luminaires.
         1) Maximum Length: 6 feet (1.8 m).
      b. Where concealed in hollow stud walls, above accessible ceilings, and under raised floors for branch circuits up to 20 A.
         1) Exception: Provide single conductor building wire in raceway for circuit homerun from first outlet to panelboard.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.
D. Comply with NEMA WC 70.
E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.
F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.
G. Conductors for Grounding and Bonding: Also comply with Section 260526.
H. Conductor Material:
   1. Provide copper conductors only. Aluminum conductors are not acceptable for this project. Conductor sizes indicated are based on copper.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.
I. Minimum Conductor Size:
   1. Branch Circuits: 12 AWG.
   2. Control Circuits: 14 AWG.
J. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

K. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 240/120 V High-Leg Delta, 3 Phase, 4 Wire System:
         1) Phase A: Black.
         2) Phase B (High-Leg): Orange.
         3) Phase C: Blue.
         4) Neutral/Grounded: White.
      c. For control circuits, comply with manufacturer’s recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE
A. Description: Single conductor insulated wire.
B. Conductor Stranding:
   1. Feeders and Branch Circuits:
      b. Size 8 AWG and Larger: Stranded.
C. Insulation Voltage Rating: 600 V.
D. Insulation:
   1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.04 METAL-CLAD CABLE
A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.
B. Conductor Stranding:
   2. Size 8 AWG and Larger: Stranded.
C. Insulation Voltage Rating: 600 V.
D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.
E. Grounding: Full-size integral equipment grounding conductor.
F. Armor: Steel, interlocked tape.

2.05 WIRING CONNECTORS
A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.
B. Connectors for Grounding and Bonding: Comply with Section 260526.
C. Wiring Connectors for Splices and Taps:
   1. Copper Conductors Size 8 AWG and Smaller: Use twist-on insulated spring connectors.
   2. Copper Conductors Size 6 AWG and Larger: Use mechanical connectors or compression connectors.
D. Wiring Connectors for Terminations:
   1. Provide terminal lugs for connecting conductors to equipment furnished with terminations designed for terminal lugs.
   2. Provide compression adapters for connecting conductors to equipment furnished with mechanical lugs when only compression connectors are specified.
3. Where over-sized conductors are larger than the equipment terminations can accommodate, provide connectors suitable for reducing to appropriate size, but not less than required for the rating of the overcurrent protective device.
4. Copper Conductors Size 8 AWG and Larger: Use mechanical connectors or compression connectors where connectors are required.
5. Stranded Conductors Size 10 AWG and Smaller: Use crimped terminals for connections to terminal screws.

E. Twist-on Insulated Spring Connectors: Rated 600 V, 221 degrees F (105 degrees C) for standard applications and 302 degrees F (150 degrees C) for high temperature applications; pre-filled with sealant and listed as complying with UL 486D for damp and wet locations.
F. Mechanical Connectors: Provide bolted type or set-screw type.
G. Compression Connectors: Provide circumferential type or hex type crimp configuration.
H. Crimped Terminals: Nylon-insulated, with insulation grip and terminal configuration suitable for connection to be made.

2.06 WIRING ACCESSORIES
A. Electrical Tape:
1. Vinyl Color Coding Electrical Tape: Integrally colored to match color code indicated; listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
2. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil (0.18 mm); resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F (-18 degrees C) and suitable for continuous temperature environment up to 221 degrees F (105 degrees C).
B. Heat Shrink Tubing: Heavy-wall, split-resistant, with factory-applied adhesive; rated 600 V; suitable for direct burial applications; listed as complying with UL 486D.
C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.
D. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that interior of building has been protected from weather.
B. Verify that work likely to damage wire and cable has been completed.
C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.
D. Verify that field measurements are as indicated.
E. Verify that conditions are satisfactory for installation prior to starting work.

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

3.03 INSTALLATION
A. Circuiting Requirements:
1. Unless dimensioned, circuit routing indicated is diagrammatic.
2. When circuit destination is indicated without specific routing, determine exact routing required.
3. Arrange circuiting to minimize splices.
4. Include circuit lengths required to install connected devices within 10 ft (3.0 m) of location indicated.
5. Maintain separation of Class 1, Class 2, and Class 3 remote-control, signaling, and power-limited circuits in accordance with NFPA 70.
6. Circuiting Adjustments: Unless otherwise indicated, when branch circuits are indicated as separate, combining them together in a single raceway is permitted, under the following conditions:
   a. Provide no more than six current-carrying conductors in a single raceway. Dedicated neutral conductors are considered current-carrying conductors.
   b. Increase size of conductors as required to account for ampacity derating.
   c. Size raceways, boxes, etc. to accommodate conductors.

7. Common Neutrals: Unless otherwise indicated, sharing of neutral/grounded conductors among single phase branch circuits of different phases installed in the same raceway is not permitted. Provide dedicated neutral/grounded conductor for each individual branch circuit.

B. Install products in accordance with manufacturer's instructions.
C. Perform work in accordance with NECA 1 (general workmanship).
D. Install metal-clad cable (Type MC) in accordance with NECA 120.
E. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

F. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

G. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.
   1. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conductors and cables to lay on ceiling tiles.

H. Terminate cables using suitable fittings.
   1. Metal-Clad Cable (Type MC):
      a. Use listed fittings.
      b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

I. Install conductors with a minimum of 12 inches (300 mm) of slack at each outlet.

J. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

K. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

L. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
   2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   3. Do not remove conductor strands to facilitate insertion into connector.
   4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
   5. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
6. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

M. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

N. Insulate ends of spare conductors using vinyl insulating electrical tape.

O. Field-Applied Color Coding: Where vinyl color coding electrical tape is used in lieu of integrally colored insulation as permitted in Part 2 under "Color Coding", apply half overlapping turns of tape at each termination and at each location conductors are accessible.

P. Identify conductors and cables in accordance with Section 260553.

Q. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

R. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.
   1. Disconnect surge protective devices (SPDs) prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPDs connected.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION 260519
SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Grounding and bonding requirements.
   B. Conductors for grounding and bonding.
   C. Connectors for grounding and bonding.
   D. Ground bars.
   E. Ground rod electrodes.

1.02 RELATED REQUIREMENTS
   A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.
   B. Section 260536 - Cable Trays for Electrical Systems: Additional grounding and bonding requirements for cable tray systems.
   C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS
   B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Verify exact locations of underground metal water service pipe entrances to building.
      2. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
   B. Sequencing:
      1. Do not install ground rod electrodes until final backfill and compaction is complete.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements for submittals procedures.
   B. Project Record Documents: Record actual locations of grounding electrode system components and connections.

1.06 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store products in accordance with manufacturer’s instructions.
PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

B. Do not use products for applications other than as permitted by NFPA 70 and product listing.

C. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

D. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

E. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by Architect. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.

F. Grounding Electrode System:
   1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
      a. Provide continuous grounding electrode conductors without splice or joint.
      b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
   2. Metal Underground Water Pipe(s):
      a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet (3.0 m) at an accessible location not more than 5 feet (1.5 m) from the point of entrance to the building.
      b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
      c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
   3. Ground Rod Electrode(s):
      a. Provide two electrodes unless otherwise indicated or required.
      b. Space electrodes not less than 10 feet (3.0 m) from each other and any other ground electrode.
      c. Where location is not indicated, locate electrode(s) at least 5 feet (1.5 m) outside building perimeter foundation as near as possible to electrical service entrance; where possible, locate in softscape (uncovered) area.
   4. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.

G. Service-Supplied System Grounding:
   1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
   2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

H. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.

2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.

3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.

4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.

6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.

7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:
   a. Metal water piping where not already effectively bonded to metal underground water pipe used as grounding electrode.
   b. Metal gas piping.

8. Provide bonding for interior metal air ducts.


I. Communications Systems Grounding and Bonding:
   1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with NFPA 70.
   2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.
      a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
      b. Raceway Size: 3/4 inch (21 mm) trade size unless otherwise indicated or required.
      c. Ground Bar Size: 1/4 by 2 by 12 inches (6 by 50 by 300 mm) unless otherwise indicated or required.

J. Cable Tray Systems: Also comply with Section 260536.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
   1. Provide products listed, classified, and labeled as suitable for the purpose intended.
   2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 260526:
   1. Use insulated copper conductors unless otherwise indicated.
      a. Exceptions:
         1) Use bare copper conductors where installed underground in direct contact with earth.
         2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
   1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
   2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
   3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Bars:
   1. Description: Copper rectangular ground bars with mounting brackets and insulators.
2. Size: As indicated.
3. Holes for Connections: As indicated or as required for connections to be made.

E. Ground Rod Electrodes:
   1. Comply with NEMA GR 1.
   3. Size: 3/4 inch (19 mm) diameter by 10 feet (3.0 m) length, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that work likely to damage grounding and bonding system components has been completed.
   B. Verify that field measurements are as indicated.
   C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Install products in accordance with manufacturer’s instructions.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.
      1. Outdoor Installations: Unless otherwise indicated, install with top of rod 6 inches (150 mm) below finished grade.
   D. Make grounding and bonding connections using specified connectors.
      1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
      2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
      3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer’s recommendations.
      4. Mechanical Connectors: Secure connections according to manufacturer’s recommended torque settings.
      5. Compression Connectors: Secure connections using manufacturer’s recommended tools and dies.
   E. Identify grounding and bonding system components in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect and test in accordance with NETA ATS except Section 4.
   C. Perform inspections and tests listed in NETA ATS, Section 7.13.
   D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION 260526
SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Support and attachment requirements and components for equipment, conduit, cable, boxes, and other electrical work.

1.02  RELATED REQUIREMENTS

A. Section 033000 - Cast-in-Place Concrete: Concrete equipment pads.
B. Section 260533.13 - Conduit for Electrical Systems: Additional support and attachment requirements for conduits.
C. Section 260536 - Cable Trays for Electrical Systems: Additional support and attachment requirements for cable tray.
D. Section 260533.16 - Boxes for Electrical Systems: Additional support and attachment requirements for boxes.
E. Section 265100 - Interior Lighting: Additional support and attachment requirements for interior luminaires.
F. Section 265600 - Exterior Lighting: Additional support and attachment requirements for exterior luminaires.

1.03  REFERENCE STANDARDS

D. MFMA-4 - Metal Framing Standards Publication; 2004.
E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04  ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 033000.

1.05  SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

1.06  QUALITY ASSURANCE

A. Comply with NFPA 70.

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FOR ELECTRICAL SYSTEMS
B. Comply with applicable building code.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of electrical work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Do not use products for applications other than as permitted by NFPA 70 and product listing.
   5. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Indoor Dry Locations: Use zinc-plated steel or approved equivalent unless otherwise indicated.
      b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel, stainless steel, or approved equivalent unless otherwise indicated.
      c. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      d. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Conduit and Cable Supports: Straps, clamps, etc. suitable for the conduit or cable to be supported.
   1. Conduit Straps: One-hole or two-hole type; steel or malleable iron.
   2. Conduit Clamps: Bolted type unless otherwise indicated.

C. Outlet Box Supports: Hangers, brackets, etc. suitable for the boxes to be supported.

D. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.

E. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.

F. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that mounting surfaces are ready to receive support and attachment components.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).
C. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

D. Unless specifically indicated or approved by Architect, do not provide support from suspended ceiling support system or ceiling grid.

E. Unless specifically indicated or approved by Architect, do not provide support from roof deck.

F. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

G. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

H. Conduit Support and Attachment: Also comply with Section 260533.13.

I. Cable Tray Support and Attachment: Also comply with Section 260536.

J. Box Support and Attachment: Also comply with Section 260533.16.

K. Interior Luminaire Support and Attachment: Also comply with Section 265100.

L. Exterior Luminaire Support and Attachment: Also comply with Section 265600.

M. Secure fasteners according to manufacturer's recommended torque settings.

N. Remove temporary supports.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect support and attachment components for damage and defects.

C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 260529
SECTION 260533.13 - CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).
B. Flexible metal conduit (FMC).
C. Liquidtight flexible metal conduit (LFMC).
D. Electrical metallic tubing (EMT).
E. Rigid polyvinyl chloride (PVC) conduit.
F. Conduit fittings.
G. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 260526 - Grounding and Bonding for Electrical Systems.
   1. Includes additional requirements for fittings for grounding and bonding.
C. Section 260529 - Hangers and Supports for Electrical Systems.
D. Section 260553 - Identification for Electrical Systems: Identification products and requirements.
E. Section 262100 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conduits.
F. Section 271000 - Structured Cabling: Additional requirements for communications systems conduits.

1.03 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2015.
B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2015.
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
D. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.
E. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2003.
F. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
G. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2013.
H. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2016.
   I. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   J. UL 1 - Flexible Metal Conduit; Current Edition, Including All Revisions.
   K. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.
   L. UL 360 - Liquid-Tight Flexible Steel Conduit; Current Edition, Including All Revisions.
   M. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.
   N. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.
   O. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate minimum sizes of conduits with the actual conductors to be installed, including adjustments for conductor sizes increased for voltage drop.
2. Coordinate the arrangement of conduits with structural members, ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
3. Verify exact conduit termination locations required for boxes, enclosures, and equipment installed under other sections or by others.
4. Coordinate the work with other trades to provide roof penetrations that preserve the integrity of the roofing system and do not void the roof warranty.
5. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.

B. Sequencing:
1. Do not begin installation of conductors and cables until installation of conduit is complete between outlet, junction and splicing points.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store conduit and fittings in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.
B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.
C. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
D. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit or electrical metallic tubing (EMT).
E. Interior, Damp or Wet Locations: Use galvanized steel rigid metal conduit.
F. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, electrical metallic tubing (EMT), or rigid PVC conduit.
G. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit.
   1. Locations subject to physical damage include, but are not limited to:
      a. Where exposed below 8 feet (2.4 m), except within electrical and communication rooms or closets.
I. Connections to Luminaires Above Accessible Ceilings: Use flexible metal conduit.
   1. Maximum Length: 6 feet (1.8 m).
J. Connections to Vibrating Equipment:
   1. Dry Locations: Use flexible metal conduit.
   2. Damp, Wet, or Corrosive Locations: Use liquidtight flexible metal conduit.
   3. Maximum Length: 6 feet (1.8 m) unless otherwise indicated.
   4. Vibrating equipment includes, but is not limited to:
      a. Motors.
K. Fished in Existing Walls, Where Necessary: Use flexible metal conduit.
2.02 CONDUIT REQUIREMENTS
   A. Electrical Service Conduits: Also comply with Section 262100.
   B. Communications Systems Conduits: Also comply with Section 271000.
   C. Fittings for Grounding and Bonding: Also comply with Section 260526.
   D. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.
   E. Provide products listed, classified, and labeled as suitable for the purpose intended.
   F. Minimum Conduit Size, Unless Otherwise Indicated:
      1. Branch Circuits: 3/4 inch (21 mm) trade size.
      2. Branch Circuit Homeruns: 3/4 inch (21 mm) trade size.
   G. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)
   A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.
   B. Fittings:
      1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
      2. Material: Use steel or malleable iron.
      3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 FLEXIBLE METAL CONDUIT (FMC)
   A. Description: NFPA 70, Type FMC standard wall steel flexible metal conduit listed and labeled as complying with UL 1, and listed for use in classified firestop systems to be used.
   B. Fittings:
      1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
      2. Material: Use steel or malleable iron.

2.05 LIQUIDTIGHT FLEXIBLE METAL CONDUIT (LFMC)
   A. Description: NFPA 70, Type LFMC polyvinyl chloride (PVC) jacketed steel flexible metal conduit listed and labeled as complying with UL 360.
   B. Fittings:
      1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
      2. Material: Use steel or malleable iron.

2.06 ELECTRICAL METALLIC TUBING (EMT)
   A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.
   B. Fittings:
      1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
      2. Material: Use steel or malleable iron.
      3. Connectors and Couplings: Use compression (gland) or set-screw type.
         a. Do not use indenter type connectors and couplings.

2.07 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT
   A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.
B. Fittings:
1. Manufacturer: Same as manufacturer of conduit to be connected.
2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.08 ACCESSORIES
A. Conduit Joint Compound: Corrosion-resistant, electrically conductive; suitable for use with the conduit to be installed.
B. Solvent Cement for PVC Conduit and Fittings: As recommended by manufacturer of conduit and fittings to be installed.
C. Pull Strings: Use nylon cord with average breaking strength of not less than 200 pound-force (890 N).

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive conduits.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
A. Install products in accordance with manufacturer's instructions.
B. Perform work in accordance with NECA 1 (general workmanship).
C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.
D. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.
E. Conduit Routing:
   1. Unless dimensioned, conduit routing indicated is diagrammatic.
   2. When conduit destination is indicated without specific routing, determine exact routing required.
   3. Conceal all conduits unless specifically indicated to be exposed.
   4. Arrange conduit to maintain adequate headroom, clearances, and access.
   5. Arrange conduit to provide no more than the equivalent of four 90 degree bends between pull points.
   6. Route conduits above water and drain piping where possible.
   7. Arrange conduit to prevent moisture traps. Provide drain fittings at low points and at sealing fittings where moisture may collect.
   8. Maintain minimum clearance of 6 inches (150 mm) between conduits and piping for other systems.
   9. Maintain minimum clearance of 12 inches (300 mm) between conduits and hot surfaces. This includes, but is not limited to:
      a. Heaters.
      b. Hot water piping.
      c. Flues.
   10. Group parallel conduits in the same area together on a common rack.
F. Conduit Support:
   1. Secure and support conduits in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
   3. Installation Above Suspended Ceilings: Do not provide support from ceiling support system. Do not provide support from ceiling grid or allow conduits to lay on ceiling tiles.
   4. Use conduit strap to support single surface-mounted conduit.
a. Use clamp back spacer with conduit strap for damp and wet locations to provide space between conduit and mounting surface.

5. Use metal channel (strut) with accessory conduit clamps to support multiple parallel surface-mounted conduits.

6. Use conduit clamp to support single conduit from beam clamp or threaded rod.

7. Use trapeze hangers assembled from threaded rods and metal channel (strut) with accessory conduit clamps to support multiple parallel suspended conduits.

8. Use of wire for support of conduits is not permitted.

G. Connections and Terminations:

1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.

2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.

3. Use suitable adapters where required to transition from one type of conduit to another.

4. Provide drip loops for liquidtight flexible conduit connections to prevent drainage of liquid into connectors.

5. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.

6. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.

7. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

H. Penetrations:

1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.

2. Make penetrations perpendicular to surfaces unless otherwise indicated.

3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.

4. Conceal bends for conduit risers emerging above ground.

5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.

6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.

7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.

8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

I. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:

1. Where conduits cross structural joints intended for expansion, contraction, or deflection.

2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.

3. Where conduits are subject to earth movement by settlement or frost.

J. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:

1. Where conduits pass from outdoors into conditioned interior spaces.

2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.
K. Provide pull string in all empty conduits and in conduits where conductors and cables are to be installed by others. Leave minimum slack of 12 inches (300 mm) at each end.
L. Provide grounding and bonding in accordance with Section 260526.
M. Identify conduits in accordance with Section 260553.

3.03 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
C. Correct deficiencies and replace damaged or defective conduits.

3.04 CLEANING
A. Clean interior of conduits to remove moisture and foreign matter.

3.05 PROTECTION
A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION 260533.13
SECTION 260533.16 - BOXES FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Outlet and device boxes up to 100 cubic inches (1,650 cu cm), including those used as junction and pull boxes.
   B. Cabinets and enclosures, including junction and pull boxes larger than 100 cubic inches (1,650 cu cm).

1.02 RELATED REQUIREMENTS
   A. Section 083100 - Access Doors and Panels: Panels for maintaining access to concealed boxes.
   B. Section 260529 - Hangers and Supports for Electrical Systems.
   C. Section 262726 - Wiring Devices:
      1. Wall plates.
      2. Additional requirements for locating boxes for wiring devices.

1.03 REFERENCE STANDARDS
   A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
   C. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.
   D. NEMA OS 1 - Sheet-Steel Outlet Boxes, Device Boxes, Covers, and Box Supports; 2013.
   E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   F. UL 50 - Enclosures for Electrical Equipment, Non-Environmental Considerations; Current Edition, Including All Revisions.
   I. UL 514A - Metallic Outlet Boxes; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
      2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
      3. Coordinate minimum sizes of boxes with the actual installed arrangement of conductors, clamps, support fittings, and devices, calculated according to NFPA 70.
      4. Coordinate minimum sizes of pull boxes with the actual installed arrangement of connected conduits, calculated according to NFPA 70.
      5. Coordinate the placement of boxes with millwork, furniture, devices, equipment, etc. installed under other sections or by others.
      6. Coordinate the work with other trades to preserve insulation integrity.
      7. Coordinate the work with other trades to provide walls suitable for installation of flush-mounted boxes where indicated.
      8. Notify Architect of any conflicts with or deviations from Contract Documents. Obtain direction before proceeding with work.
1.05 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING
   A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS
2.01 BOXES
   A. General Requirements:
      1. Do not use boxes and associated accessories for applications other than as permitted by NFPA 70 and product listing.
      2. Provide all boxes, fittings, supports, and accessories required for a complete raceway system and to accommodate devices and equipment to be installed.
      3. Provide products listed, classified, and labeled as suitable for the purpose intended.
      4. Where box size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.
      5. Provide grounding terminals within boxes where equipment grounding conductors terminate.
   B. Outlet and Device Boxes Up to 100 cubic inches (1,650 cu cm), Including Those Used as Junction and Pull Boxes:
      1. Use sheet-steel boxes for dry locations unless otherwise indicated or required.
      2. Use cast iron boxes or cast aluminum boxes for damp or wet locations unless otherwise indicated or required; furnish with compatible weatherproof gasketed covers.
      3. Use cast iron boxes or cast aluminum boxes where exposed galvanized steel rigid metal conduit or exposed intermediate metal conduit (IMC) is used.
      4. Use suitable concrete type boxes where flush-mounted in concrete.
      5. Use suitable masonry type boxes where flush-mounted in masonry walls.
      6. Use raised covers suitable for the type of wall construction and device configuration where required.
      7. Use shallow boxes where required by the type of wall construction.
      8. Do not use "through-wall" boxes designed for access from both sides of wall.
      9. Sheet-Steel Boxes: Comply with NEMA OS 1, and list and label as complying with UL 514A.
     10. Cast Metal Boxes: Comply with NEMA FB 1, and list and label as complying with UL 514A; furnish with threaded hubs.
     11. Boxes for Supporting Luminaires and Ceiling Fans: Listed as suitable for the type and weight of load to be supported; furnished with fixture stud to accommodate mounting of luminaire where required.
     13. Wall Plates: Comply with Section 262726.
   C. Cabinets and Enclosures, Including Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
      1. Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E, or UL 508A.
      2. NEMA 250 Environment Type, Unless Otherwise Indicated:
         a. Indoor Clean, Dry Locations: Type 1, painted steel.
         b. Outdoor Locations: Type 3R, painted steel.
      3. Junction and Pull Boxes Larger Than 100 cubic inches (1,650 cu cm):
         a. Provide screw-cover or hinged-cover enclosures unless otherwise indicated.
4. Finish for Painted Steel Enclosures: Manufacturer’s standard grey unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.
B. Verify that mounting surfaces are ready to receive boxes.
C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer’s instructions.
B. Install boxes in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards where mounting heights are not indicated.
C. Arrange equipment to provide minimum clearances in accordance with manufacturer’s instructions and NFPA 70.
D. Box Locations:
   1. Locate boxes to be accessible. Provide access panels in accordance with Section 083100 as required where approved by the Architect.
   2. Unless dimensioned, box locations indicated are approximate.
   3. Locate boxes as required for devices installed under other sections or by others.
      a. Switches, Receptacles, and Other Wiring Devices: Comply with Section 262726.
   4. Locate boxes so that wall plates do not span different building finishes.
   5. Locate boxes so that wall plates do not cross masonry joints.
   6. Unless otherwise indicated, where multiple outlet boxes are installed at the same location at different mounting heights, install along a common vertical center line.
   7. Do not install flush-mounted boxes on opposite sides of walls back-to-back. Provide minimum 6 inches (150 mm) horizontal separation unless otherwise indicated.
   8. Locate junction and pull boxes in the following areas, unless otherwise indicated or approved by the Architect:
      a. Concealed above accessible suspended ceilings.
      b. Within joists in areas with no ceiling.
      c. Electrical rooms.
E. Box Supports:
   1. Secure and support boxes in accordance with NFPA 70 and Section 260529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure except for cast metal boxes (other than boxes used for fixture support) supported by threaded conduit connections in accordance with NFPA 70. Do not provide support from piping, ductwork, or other systems.
F. Install boxes plumb and level.
G. Flush-Mounted Boxes:
   1. Install boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that front edge of box or associated raised cover is not set back from finished surface more than 1/4 inch (6 mm) or does not project beyond finished surface.
   2. Install boxes in combustible materials such as wood so that front edge of box or associated raised cover is flush with finished surface.
   3. Repair rough openings around boxes in noncombustible materials such as concrete, tile, gypsum, plaster, etc. so that there are no gaps or open spaces greater than 1/8 inch (3 mm) at the edge of the box.
H. Install boxes as required to preserve insulation integrity.
I. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

J. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.

K. Close unused box openings.

L. Install blank wall plates on junction boxes and on outlet boxes with no devices or equipment installed or designated for future use.

M. Provide grounding and bonding in accordance with Section 260526.

3.03 CLEANING
   A. Clean interior of boxes to remove dirt, debris, plaster and other foreign material.

3.04 PROTECTION
   A. Immediately after installation, protect boxes from entry of moisture and foreign material until ready for installation of conductors.

END OF SECTION 260533.16
SECTION 260536 - CABLE TRAYS FOR ELECTRICAL SYSTEMS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Metal cable tray systems:
   1. Metal ladder cable tray.

1.02  RELATED REQUIREMENTS

A. Section 078400 - Firestopping.
B. Section 260526 - Grounding and Bonding for Electrical Systems.
C. Section 260529 - Hangers and Supports for Electrical Systems.
D. Section 26053 - Identification for Electrical Systems: Identification products and requirements.

1.03  REFERENCE STANDARDS

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
D. NEMA FG 1 - Fiberglass Cable Tray Systems; 1993 (Revised 1994).
E. NEMA VE 1 - Metal Cable Tray Systems; 2017.
F. NEMA VE 2 - Cable Tray Installation Guidelines; 2013, with Errata (2016).
G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

PART 2  PRODUCTS

2.01  CABLE TRAY SYSTEM - GENERAL REQUIREMENTS

A. Provide new cable tray system consisting of all required components, fittings, supports, accessories, etc. as necessary for a complete system.
B. Provide products listed, classified, and labeled as suitable for the purpose intended.
C. Do not use cable tray for applications other than as permitted by NFPA 70 and product listing/classification.
D. Provide cable tray system and associated components suitable for use at indicated span/load ratings under the service conditions at the installed location.
E. Unless otherwise indicated, specified span/load ratings are according to NEMA VE 1 (metal cable tray systems) or NEMA FG 1 (fiberglass cable tray systems) with safety factor of 1.5 and working load only (no additional concentrated static load).
F. Unless otherwise indicated, specified load/fill depths and inside widths are nominal values according to NEMA VE 1 (metal cable tray systems) or NEMA FG 1 (fiberglass cable tray systems) with applicable allowable tolerances.

2.02  METAL CABLE TRAY SYSTEMS

A. Comply with NEMA VE 1.
B. Finishes:
C. Metal Ladder Cable Tray:
   1. Material: Mill-galvanized before fabrication (pre-galvanized) steel.
   2. Load/Fill Depth: As indicated on drawings.
   3. Span/Load Rating: As indicated on drawings.
   4. Rung Spacing: 9 inches (229 mm) on center for straight lengths.
5. Inside Width: As indicated on drawings.
6. Inside Radius of Fittings: 12 inches (305 mm).

**PART 3 EXECUTION**

**3.01 EXAMINATION**

A. Verify that work likely to damage cable tray system has been completed.
B. Verify that field measurements are as indicated.
C. Verify that the dimensions and span/load ratings of cable tray system components are consistent with the indicated requirements.
D. Verify that mounting surfaces are ready to receive cable tray and associated supports.
E. Verify that conditions are satisfactory for installation prior to starting work.

**3.02 INSTALLATION**

A. Install products in accordance with manufacturer's instructions.
B. Install cable tray in accordance with NECA 1 (general workmanship), and NEMA VE 2.
C. Unless otherwise indicated, arrange cable tray to be parallel or perpendicular to building lines.
D. Arrange cable tray to provide required clearances and maintain cable access.
   1. Cable Tray for Telecommunications Cables: Maintain recommended separation from sources of EMI greater than 5 kVA in accordance with NECA/BICSI 568.
E. Install cable tray plumb and level, with sections aligned and with horizontal runs at the proper elevation.
F. Metal Wire Mesh/Basket Cable Tray: Field fabricate fittings in accordance with manufacturer's instructions, using only manufacturer-approved connectors classified for bonding.
   1. Inside Radius of Fittings: 12 inches (305 mm).
G. Cable Tray Movement Provisions:
   1. Provide suitable expansion fittings where cable tray is subject to movement, including but not limited to:
      a. Where cable tray crosses structural joints intended for expansion.
      b. Long straight cable tray runs in accordance with NEMA VE 2.
   2. Use expansion guides in lieu of hold-down clamps where prescribed in NEMA VE 2.
   3. Set gaps for expansion fittings in accordance with NEMA VE 2.
H. Cable Provisions:
   1. Use suitable fixed barrier strips to maintain separation of cables as indicated and as required by NFPA 70.
   2. Use suitable drop-out fittings or bushings where cables exit cable tray as required to maintain minimum cable bending radius.
   3. Use suitable cable support fittings for long vertical cable tray runs with heavy cables.
I. Provide end closures at unconnected ends of cable tray runs.
J. Cable Tray Support:
   1. Use manufacturer's recommended hangers and supports, located in accordance with NEMA VE 2 and manufacturer's requirements, but not exceeding specified span unless otherwise approved by Engineer. Provide required support and attachment in accordance with Section 260529, where not furnished by cable tray manufacturer.
   2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.
K. Grounding and Bonding Requirements, in Addition to Requirements of Section 260526:
   1. Comply with grounding and bonding requirements of NEMA VE 2.
   2. Metal Cable Tray Systems: Use suitable bonding jumpers or classified connectors to provide electrical continuity.
3. Provide suitable equipment grounding conductor in each cable tray, except where cable tray contains only multiconductor cables with integral equipment grounding conductors. Do not use metal cable tray system as sole equipment grounding conductor.
   a. Equipment Grounding Conductor for Steel Cable Tray: Use bare or insulated copper conductor.
   b. Minimum Equipment Grounding Conductor Size: 6 AWG copper.
   c. Bond equipment grounding conductor to each cable tray section using suitable listed ground clamps. Separate bonding jumpers are not required where properly bonded equipment grounding conductor provides equivalent continuity.

L. Conduit Termination:
   1. Use listed cable tray conduit clamps (evaluated for bonding connection) to terminate conduits at cable tray.
   2. Provide insulating bushing at conduit termination to protect cables.
   3. Provide independent support for conduit.

M. Cable Installation:
   1. Comply with cable installation requirements of NEMA VE 2.
   2. Use appropriate cable pulling tools, applied to prevent excessive force on cable tray system and maintain minimum cable bending radius.
   3. Use cable clamps or cable ties to fasten conductors/cables to vertical and horizontal runs of cable tray.
      a. Distance Between Fastening Points for Vertical Runs: 18 inches (450 mm).
      b. Distance Between Fastening Points for Horizontal Runs: As required to maintain spacing and confine conductor/cable within the cable fill area.

N. Penetrations: Install firestopping to preserve fire resistance rating of building elements, using materials and methods specified in Section 078400.

O. Identification Requirements, in Addition to Those Specified in Section 260553.

P. Install cable tray covers where indicated.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect cable tray system for damage and defects.
   C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.
   D. Correct deficiencies and replace damaged or defective cable tray system components.

3.04 ADJUSTING
   A. Adjust tightness of mechanical connections to manufacturer's recommended torque settings.

3.05 CLEANING
   A. Remove dirt and debris from cable tray.
   B. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.06 PROTECTION
   A. Protect cable tray system from subsequent construction operations.

END OF SECTION 260536
SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Electrical identification requirements.
   B. Identification nameplates and labels.
   C. Wire and cable markers.
   D. Voltage markers.
   E. Floor marking tape.
   F. Warning signs and labels.

1.02 RELATED REQUIREMENTS
   A. Section 099113 - Exterior Painting.
   B. Section 099123 - Interior Painting.
   C. Section 260519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.
   D. Section 260536 - Cable Trays for Electrical Systems: Additional identification requirements for cable tray systems.
   E. Section 262726 - Wiring Devices - Lutron: Device and wallplate finishes; factory pre-marked wallplates.
   F. Section 271000 - Structured Cabling: Identification for communications cabling and devices.

1.03 REFERENCE STANDARDS
   C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   D. NFPA 70E - Standard for Electrical Safety in the Workplace; 2018.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Verify final designations for equipment, systems, and components to be identified prior to fabrication of identification products.
   B. Sequencing:
      1. Do not conceal items to be identified, in locations such as above suspended ceilings, until identification products have been installed.
      2. Do not install identification products until final surface finishes and painting are complete.

1.05 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.

1.06 FIELD CONDITIONS
   A. Do not install adhesive products when ambient temperature is lower than recommended by manufacturer.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS
   A. Existing Work: Unless specifically excluded, identify existing elements to remain that are not already identified in accordance with specified requirements.
   B. Identification for Equipment:
1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
   a. Panelboards:
      1) Identify ampere rating.
      2) Identify voltage and phase.
      3) Identify power source and circuit number. Include location when not within sight of equipment.
      4) Identify main overcurrent protective device. Use identification label for panelboards with a door. For power distribution panelboards without a door, use identification nameplate.
      5) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
      6) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
   b. Enclosed switches, circuit breakers, and motor controllers:
      1) Identify voltage and phase.
      2) Identify power source and circuit number. Include location when not within sight of equipment.
      3) Identify load(s) served. Include location when not within sight of equipment.

2. Service Equipment:
   a. Use identification nameplate to identify each service disconnecting means.

3. Use identification nameplate to identify switchboards and panelboards utilizing a high leg delta system in accordance with NFPA 70.

4. Use field-painted floor markings, floor marking tape, or warning labels to identify required equipment working clearances where indicated or where required by the authority having jurisdiction.
   a. Field-Painted Floor Markings: Alternating black and white stripes, 3 inches (76 mm) wide, painted in accordance with Section 099123 and 099113.

5. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following:
   a. Service equipment.
   b. Industrial control panels.
   c. Industrial machinery.

6. Arc Flash Hazard Warning Labels: Use warning labels to identify arc flash hazards for electrical equipment, such as switchboards, panelboards, industrial control panels, meter socket enclosures, and motor control centers that are likely to require examination, adjustment, servicing, or maintenance while energized.
   a. Legend: Include orange header that reads "WARNING", followed by the word message "Arc Flash and Shock Hazard; Appropriate PPE Required; Do not operate controls or open covers without appropriate personal protection equipment; Failure to comply may result in injury or death; Refer to NFPA 70E for minimum PPE requirements" or approved equivalent.
   b. Service Equipment: Include the following information in accordance with NFPA 70.
      1) Nominal system voltage.
      2) Available fault current.
      3) Clearing time of service overcurrent protective device(s).
      4) Date label applied.

C. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 260519.
   2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment.

D. Identification for Raceways:
1. Use voltage markers to identify highest voltage present for accessible conduits at maximum intervals of 20 feet (6.1 m).
2. Use voltage markers to identify highest voltage present for wireways at maximum intervals of 20 feet (6.1 m).

E. Identification for Cable Tray: Comply with Section 260536.

F. Identification for Boxes:
   1. Use voltage markers to identify highest voltage present.
   2. Use warning labels to identify electrical hazards for boxes containing exposed live parts or exposed conductors operating at over 600 V nominal with the word message "DANGER; HIGH VOLTAGE; KEEP OUT".

G. Identification for Devices:
   1. Identification for Communications Devices: Comply with Section 271000.
   2. Wiring Device and Wallplate Finishes: Comply with Section 262726.
   3. Use identification label or engraved wallplate to identify serving branch circuit for all receptacles.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Materials:
      a. Indoor Clean, Dry Locations: Use plastic nameplates.
      b. Outdoor Locations: Use plastic, stainless steel, or aluminum nameplates suitable for exterior use.
   2. Plastic Nameplates: Two-layer or three-layer laminated acrylic or electrically non-conductive phenolic with beveled edges; minimum thickness of 1/16 inch (1.6 mm); engraved text.
   3. Stainless Steel Nameplates: Minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
   4. Aluminum Nameplates: Anodized; minimum thickness of 1/32 inch (0.8 mm); engraved or laser-etched text.
   5. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch (25 mm) high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
   2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

C. Format for Equipment Identification:
   1. Minimum Size: 1 inch (25 mm) by 2.5 inches (64 mm).
   2. Legend:
      a. Equipment designation or other approved description.
   3. Text: All capitalized unless otherwise indicated.
   4. Minimum Text Height:
      a. Equipment Designation: 1/2 inch (13 mm).
   5. Color:

D. Format for Receptacle Identification:
   1. Minimum Size: 3/8 inch (10 mm) by 1.5 inches (38 mm).
   2. Legend: Power source and circuit number or other designation indicated.
      a. Include voltage and phase for other than 120 V, single phase circuits.
   3. Text: All capitalized unless otherwise indicated.
   4. Minimum Text Height: 3/16 inch (5 mm).
   5. Color: Black text on clear background.
2.03 WIRE AND CABLE MARKERS

A. Markers for Conductors and Cables: Use wrap-around self-adhesive vinyl cloth, wrap-around self-adhesive vinyl self-laminating, heat-shrink sleeve, plastic sleeve, plastic clip-on, or vinyl split sleeve type markers suitable for the conductor or cable to be identified.

B. Markers for Conductor and Cable Bundles: Use plastic marker tags secured by nylon cable ties.

C. Legend: Power source and circuit number or other designation indicated.

D. Text: Use factory pre-printed or machine-printed text, all capitalized unless otherwise indicated.

E. Minimum Text Height: 1/8 inch (3 mm).

F. Color: Black text on white background unless otherwise indicated.

2.04 VOLTAGE MARKERS

A. Markers for Conduits: Use factory pre-printed self-adhesive vinyl, self-adhesive vinyl cloth, or vinyl snap-around type markers.

B. Markers for Boxes and Equipment Enclosures: Use factory pre-printed self-adhesive vinyl or self-adhesive vinyl cloth type markers.

C. Minimum Size:
   1. Markers for Conduits: As recommended by manufacturer for conduit size to be identified.
   2. Markers for Pull Boxes: 1 1/8 by 4 1/2 inches (29 by 110 mm).
   3. Markers for Junction Boxes: 1/2 by 2 1/4 inches (13 by 57 mm).

D. Legend:
   1. Markers for Voltage Identification: Highest voltage present.

E. Color: Black text on orange background unless otherwise indicated.

2.05 FLOOR MARKING TAPE

A. Floor Marking Tape for Equipment Working Clearance Identification: Self-adhesive vinyl or polyester tape with overlaminate, 3 inches (76 mm) wide, with alternating black and white stripes.

2.06 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
   1. Materials:
   2. Minimum Size: 7 by 10 inches (178 by 254 mm) unless otherwise indicated.

C. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   3. Minimum Size: 2 by 4 inches (51 mm by 102 mm) unless otherwise indicated.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to receive adhesive products according to manufacturer's instructions.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
4. Elevated Equipment: Legible from the floor or working platform.
5. Branch Devices: Adjacent to device.
6. Interior Components: Legible from the point of access.
7. Conduits: Legible from the floor.
8. Boxes: Outside face of cover.
9. Conductors and Cables: Legible from the point of access.
10. Devices: Outside face of cover.

C. Install identification products centered, level, and parallel with lines of item being identified.
D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.
E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.
F. Mark all handwritten text, where permitted, to be neat and legible.

3.03 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.
B. Replace self-adhesive labels and markers that exhibit bubbles, wrinkles, curling or other signs of improper adhesion.

END OF SECTION 260553
SECTION 260583 - WIRING CONNECTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Electrical connections to equipment.

1.02 RELATED REQUIREMENTS
   A. Section 260519 - Low-Voltage Electrical Power Conductors and Cables.
   B. Section 260533.13 - Conduit for Electrical Systems.
   C. Section 260533.16 - Boxes for Electrical Systems.
   D. Section 262726 - Wiring Devices.
   E. Section 262816.16 - Enclosed Switches.

1.03 REFERENCE STANDARDS
   A. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2015).
   B. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.
   C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Obtain and review shop drawings, product data, manufacturer's wiring diagrams, and manufacturer's instructions for equipment furnished under other sections.
      2. Determine connection locations and requirements.
   B. Sequencing:
      1. Install rough-in of electrical connections before installation of equipment is required.
      2. Make electrical connections before required start-up of equipment.

1.05 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Products: Listed, classified, and labeled as suitable for the purpose intended.
   C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MATERIALS
   A. Cords and Caps: NEMA WD 6; match receptacle configuration at outlet provided for equipment.
      1. Colors: Conform to NEMA WD 1.
      2. Cord Construction: NFPA 70, Type SO, multiconductor flexible cord with identified equipment grounding conductor, suitable for use in damp locations.
      3. Size: Suitable for connected load of equipment, length of cord, and rating of branch circuit overcurrent protection.
   B. Disconnect Switches: As specified in Section 262816.16 and in individual equipment sections.
   C. Wiring Devices: As specified in Section 262726.
   D. Flexible Conduit: As specified in Section 260533.13.
   E. Wire and Cable: As specified in Section 260519.
   F. Boxes: As specified in Section 260533.16.
2.02 EQUIPMENT CONNECTIONS

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that equipment is ready for electrical connection, wiring, and energization.

3.02 ELECTRICAL CONNECTIONS

A. Make electrical connections in accordance with equipment manufacturer's instructions.
B. Make conduit connections to equipment using flexible conduit. Use liquidtight flexible conduit with watertight connectors in damp or wet locations.
C. Connect heat producing equipment using wire and cable with insulation suitable for temperatures encountered.
D. Provide receptacle outlet to accommodate connection with attachment plug.
E. Provide cord and cap where field-supplied attachment plug is required.
F. Install suitable strain-relief clamps and fittings for cord connections at outlet boxes and equipment connection boxes.
G. Install disconnect switches, controllers, control stations, and control devices to complete equipment wiring requirements.
H. Install terminal block jumpers to complete equipment wiring requirements.
I. Install interconnecting conduit and wiring between devices and equipment to complete equipment wiring requirements.

END OF SECTION 260583
SECTION 260923 - LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Occupancy sensors.
B. Outdoor motion sensors.
C. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 260529 - Hangers and Supports for Electrical Systems.
B. Section 260533.16 - Boxes for Electrical Systems.
C. Section 262726 - Wiring Devices: Devices for manual control of lighting, including wall switches and wall dimmers.

1.03 REFERENCE STANDARDS
A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
B. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate the placement of lighting control devices with millwork, furniture, equipment, etc. installed under other sections or by others.
   2. Coordinate the placement of wall switch occupancy sensors with actual installed door swings.
   3. Coordinate the placement of occupancy sensors with millwork, furniture, equipment or other potential obstructions to motion detection coverage installed under other sections or by others.
   4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.
B. Sequencing:
   1. Do not install lighting control devices until final surface finishes and painting are complete.

1.05 SUBMITTALS
A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Include ratings, configurations, standard wiring diagrams, dimensions, colors, service condition requirements, and installed features.

1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION
A. Store products in a clean, dry space in original manufacturer's packaging in accordance with manufacturer's written instructions until ready for installation.

1.08 FIELD CONDITIONS

1.09 WARRANTY
A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Provide five year manufacturer warranty for all occupancy sensors.
PART 2 PRODUCTS

2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.
B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

2.02 OCCUPANCY SENSORS

A. All Occupancy Sensors:
   1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
   2. Sensor Technology:
      a. Passive Infrared/Ultrasonic Dual Technology Occupancy Sensors: Designed to detect occupancy using a combination of both passive infrared and ultrasonic technologies.
   3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
   4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
   5. Dual Technology Occupancy Sensors: Field configurable turn-on and hold-on activation with settings for activation by either or both sensing technologies.
   6. Passive Infrared Lens Field of View: Field customizable by addition of factory masking material, adjustment of integral blinders, or similar means to block motion detection in selected areas.
   7. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
   9. Adaptive Technology: Field selectable; capable of self-adjusting sensitivity and time delay according to conditions.
   10. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.
   11. Load Rating for Line Voltage Occupancy Sensors: As required to control the load indicated on drawings.
   12. Where wired sensors are indicated, wireless sensors are not acceptable without prior approval of Architect.

B. Wall Switch Occupancy Sensors:
   1. All Wall Switch Occupancy Sensors:
      a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.
      b. Unless otherwise indicated or required to control the load indicated on drawings, provide line voltage units with self-contained relay.
      c. Operation: Field selectable to operate either as occupancy sensor (automatic on/off) or as vacancy sensor (manual-on/automatic off).
      d. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.
   2. Passive Infrared/Ultrasonic Dual Technology Wall Switch Occupancy Sensors: Capable of detecting motion within an area of 900 square feet (83.6 sq m).

C. Ceiling Mounted Occupancy Sensors:
   1. All Ceiling Mounted Occupancy Sensors:
1. Low profile occupancy sensors designed for ceiling installation.
   a. Description: Low profile occupancy sensors designed for ceiling installation.
   b. Unless otherwise indicated or required to control the load indicated on drawings, provide line voltage units with self-contained relay.
   c. Occupancy sensor to be field selectable as either manual-on/automatic-off or automatic on/off.

2. Passive Infrared/Ultrasonic Dual Technology Ceiling Mounted Occupancy Sensors:
   a. Standard Range Sensors: Capable of detecting motion within an area of 450 square feet (41.8 sq m) at a mounting height of 9 feet (2.7 m), with a field of view of 360 degrees.

2.03 OUTDOOR MOTION SENSORS
   A. Description: Factory-assembled wet location listed device suitable for wall or ceiling/eave mounting, with integral swivel for field adjustment of coverage, capable of detecting motion for automatic control of load indicated.
   B. Sensor Technology: Passive Infrared (PIR) designed to detect occupancy by sensing movement of thermal energy between zones.
   C. Operation: Unless otherwise indicated, motion sensor to turn load on when motion is detected and to turn load off when no motion is detected during an adjustable turn-off delay time interval.
   D. Turn-Off Delay: Field adjustable, with time delay settings available up to 15 minutes.
   E. Integral Photocell: For dusk to dawn operation.
   F. Manual Override: Activated by switching power off to unit and then back on.
   G. Load Rating: 1,000 W incandescent and fluorescent load at 120 V ac.
   H. Coverage: Capable of detecting motion within a distance of 50 feet (15 m) at a mounting height of 8 feet (2.4 m), with a field of view of 270 degrees.

2.04 ACCESSORIES
   A. Control and Timing Relays:
      1. Comply with NEMA ICS 5.
      2. Provide number and type of relays indicated or required to perform necessary functions.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
   C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.
   D. Verify that final surface finishes are complete, including painting.
   E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.
   F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.
   G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Provide extension rings to bring outlet boxes flush with finished surface.
   B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
   A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of lighting control devices provided under this section.
   1. Mounting Heights: As indicated on the drawings.
C. Install lighting control devices in accordance with manufacturer's instructions.
D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
E. Install lighting control devices plumb and level, and held securely in place.
F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 262726.
G. Provide required supports in accordance with Section 260529.
H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
I. Occupancy Sensor Locations:
   1. Location Adjustments: Within the design intent, reasonably minor adjustments to locations may be made in order to optimize coverage and avoid conflicts or problems affecting coverage.
   2. Locate ultrasonic and dual technology passive infrared/ultrasonic occupancy sensors a minimum of 4 feet (1.2 m) from air supply ducts or other sources of heavy air flow and as per manufacturer's recommendations, in order to minimize false triggers.

3.04 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect each lighting control device for damage and defects.
   C. Test occupancy sensors to verify proper operation, including time delays and ambient light thresholds where applicable. Verify optimal coverage for entire room or area. Record test results in written report to be included with submittals.
   D. Correct wiring deficiencies and replace damaged or defective lighting control devices.

3.05 ADJUSTING
   A. Adjust devices and wall plates to be flush and level.
   B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by Architect.
   C. Adjust position of directional occupancy sensors and outdoor motion sensors to achieve optimal coverage as required.
   D. Where indicated or as directed by Architect, install factory masking material or adjust integral blinders on passive infrared (PIR) and dual technology occupancy sensor lenses to block undesired motion detection.

3.06 CLEANING
   A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

3.07 CLOSEOUT ACTIVITIES
   A. Training: Train Owner's personnel on operation, adjustment, programming, and maintenance of lighting control devices.
      1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
      2. Location: At project site.

END OF SECTION 260923
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Electrical service requirements.

1.02 RELATED REQUIREMENTS
   A. Section 260526 - Grounding and Bonding for Electrical Systems.
   B. Section 260529 - Hangers and Supports for Electrical Systems.
   C. Section 260553 - Identification for Electrical Systems: Identification products and requirements.

1.03 DEFINITIONS
   A. Service Point: The point of connection between the facilities of the serving utility and the premises wiring as defined in NFPA 70, and as designated by the Utility Company.

1.04 REFERENCE STANDARDS
   B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 ADMINISTRATIVE REQUIREMENTS
   A. No later than two weeks following date of the Agreement, notify Utility Company of anticipated date of service.
   B. Coordination:
      1. Verify the following with Utility Company representative:
         a. Utility Company requirements, including division of responsibility.
         b. Exact location and details of utility point of connection.
         c. Utility easement requirements.
         d. Utility Company charges associated with providing service.
      2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for electrical service and associated equipment.
      3. Coordinate arrangement of service entrance equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   C. Utility Company charges associated with providing permanent service to be paid by Owner.
   D. Preinstallation Meeting: Convene one week prior to commencing work of this section to review service requirements and details with Utility Company representative.
   E. Scheduling:
      1. Arrange for inspections necessary to obtain Utility Company approval of installation.

1.06 QUALITY ASSURANCE
   A. Comply with the following:
      2. NFPA 70 (National Electrical Code).
      3. The requirements of the Utility Company.
   B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.
PART 2 PRODUCTS

2.01 ELECTRICAL SERVICE REQUIREMENTS
   A. Provide relocation of existing electrical service consisting of all required conduits, conductors, equipment, metering provisions, supports, accessories, etc. as necessary for connection between Utility Company point of supply and service entrance equipment.
   B. Electrical Service Characteristics: As indicated on drawings.
   D. Division of Responsibility: As indicated on drawings.
   E. Products Furnished by Contractor: Comply with Utility Company requirements.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that ratings and configurations of service entrance equipment are consistent with the indicated requirements.
   C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Verify and mark locations of existing underground utilities.

3.03 INSTALLATION
   A. Install products in accordance with manufacturer's instructions and Utility Company requirements.
   B. Perform work in accordance with NECA 1 (general workmanship).
   C. Arrange equipment to provide minimum clearances and required maintenance access.
   D. Provide required support and attachment components in accordance with Section 260529.
   E. Provide grounding and bonding for service entrance equipment in accordance with Section 260526.
   F. Identify service entrance equipment, including main service disconnect(s) in accordance with Section 260553.

3.04 PROTECTION
   A. Protect installed equipment from subsequent construction operations.

END OF SECTION 262100
SECTION 262416 - PANELBOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Power distribution panelboards.
B. Lighting and appliance panelboards.
C. Overcurrent protective devices for panelboards.

1.02 RELATED REQUIREMENTS

A. Section 260526 - Grounding and Bonding for Electrical Systems.
B. Section 260529 - Hangers and Supports for Electrical Systems.
C. Section 264300 - Surge Protective Devices.

1.03 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2018.
D. NEMA PB 1 - Panelboards; 2011.
E. NEMA PB 1.1 - General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less; 2013.
G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
J. UL 67 - Panelboards; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the work with other trades to avoid placement of ductwork, piping, equipment, or other potential obstructions within the dedicated equipment spaces and working clearances for electrical equipment required by NFPA 70.
   2. Coordinate arrangement of electrical equipment with the dimensions and clearance requirements of the actual equipment to be installed.
   3. Verify with manufacturer that conductor terminations are suitable for use with the conductors to be installed.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets for panelboards, enclosures, overcurrent protective devices, and other installed components and accessories.
1.06 QUALITY ASSURANCE
A. Conform to requirements of NFPA 70.
B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Receive, inspect, handle, and store panelboards in accordance with manufacturer's instructions and NECA 407.
B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
C. Handle carefully in accordance with manufacturer's written instructions to avoid damage to panelboard internal components, enclosure, and finish.

PART 2 PRODUCTS
2.01 PANELBOARDS - GENERAL REQUIREMENTS
A. Provide products listed, classified, and labeled as suitable for the purpose intended.
B. Unless otherwise indicated, provide products suitable for continuous operation under the following service conditions:
   1. Altitude: Less than 6,600 feet (2,000 m).
   2. Ambient Temperature:
      a. Panelboards Containing Circuit Breakers: Between 23 degrees F (-5 degrees C) and 104 degrees F (40 degrees C).
C. Short Circuit Current Rating:
   1. Provide panelboards with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.
D. Panelboards Used for Service Entrance: Listed and labeled as suitable for use as service equipment according to UL 869A.
E. Mains: Configure for top or bottom incoming feed as indicated or as required for the installation.
F. Branch Overcurrent Protective Devices: Replaceable without disturbing adjacent devices.
G. Bussing: Sized in accordance with UL 67 temperature rise requirements.
   1. Provide fully rated neutral bus unless otherwise indicated, with a suitable lug for each feeder or branch circuit requiring a neutral connection.
   2. Provide solidly bonded equipment ground bus in each panelboard, with a suitable lug for each feeder and branch circuit equipment grounding conductor.
H. Conductor Terminations: Suitable for use with the conductors to be installed.
I. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
   2. Boxes: Galvanized steel unless otherwise indicated.
      a. Provide wiring gutters sized to accommodate the conductors to be installed.
   3. Fronts:
      a. Fronts for Surface-Mounted Enclosures: Same dimensions as boxes.
   4. Lockable Doors: All locks keyed alike unless otherwise indicated.
J. Future Provisions: Prepare all unused spaces for future installation of devices including bussing, connectors, mounting hardware and all other required provisions.
K. Surge Protective Devices: Where factory-installed, internally mounted surge protective devices are provided in accordance with Section 264300, list and label panelboards as a complete assembly including surge protective device.
2.02 POWER DISTRIBUTION PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, power and feeder distribution type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:
   1. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   2. Main and Neutral Lug Type: Mechanical.

C. Bussing:
   1. Phase and Neutral Bus Material: Aluminum.

D. Circuit Breakers:
   1. Provide bolt-on type or plug-in type secured with locking mechanical restraints.
   2. Provide thermal magnetic circuit breakers unless otherwise indicated.

E. Enclosures:
   1. Provide surface-mounted enclosures unless otherwise indicated.
   2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
   3. Provide clear plastic circuit directory holder mounted on inside of door.

2.03 LIGHTING AND APPLIANCE PANELBOARDS

A. Description: Panelboards complying with NEMA PB 1, lighting and appliance branch circuit type, circuit breaker type, and listed and labeled as complying with UL 67; ratings, configurations and features as indicated on the drawings.

B. Conductor Terminations:
   1. Main and Neutral Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   2. Main and Neutral Lug Type: Mechanical.

C. Bussing:

D. Circuit Breakers: Thermal magnetic bolt-on type unless otherwise indicated.

E. Enclosures:
   1. Provide surface-mounted enclosures as indicated.
   2. Fronts: Provide lockable hinged door with concealed hinges for access to overcurrent protective device handles without exposing live parts.
   3. Provide clear plastic circuit directory holder mounted on inside of door.

2.04 OVERCURRENT PROTECTIVE DEVICES

A. Molded Case Circuit Breakers:
   1. Description: Quick-make, quick-break, over center toggle, trip-free, trip-indicating circuit breakers listed and labeled as complying with UL 489, and complying with FS W-C-375 where applicable; ratings, configurations, and features as indicated on the drawings.
   2. Interrupting Capacity:
      a. Provide circuit breakers with interrupting capacity as required to provide the short circuit current rating indicated, but not less than:
         1) 10,000 rms symmetrical amperes at 240 VAC.
      b. Fully Rated Systems: Provide circuit breakers with interrupting capacity not less than the short circuit current rating indicated.
   3. Conductor Terminations:
a. Provide mechanical lugs unless otherwise indicated.
b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.

4. Thermal Magnetic Circuit Breakers: For each pole, furnish thermal inverse time tripping element for overload protection and magnetic instantaneous tripping element for short circuit protection.

5. Multi-Pole Circuit Breakers: Furnish with common trip for all poles.

6. Provide the following circuit breaker types where indicated:
   a. Ground Fault Circuit Interrupter (GFCI) Circuit Breakers: Listed as complying with UL 943, class A for protection of personnel.

7. Do not use tandem circuit breakers.

8. Do not use handle ties in lieu of multi-pole circuit breakers.

9. Provide multi-pole circuit breakers for multi-wire branch circuits as required by NFPA 70.

2.05 SOURCE QUALITY CONTROL
   A. Factory test panelboards according to NEMA PB 1.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that the ratings and configurations of the panelboards and associated components are consistent with the indicated requirements.
   C. Verify that mounting surfaces are ready to receive panelboards.
   D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION
   A. Perform work in accordance with NECA 1 (general workmanship).
   B. Install products in accordance with manufacturer's instructions.
   C. Install panelboards in accordance with NECA 407 and NEMA PB 1.1.
   D. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
   E. Provide required support and attachment in accordance with Section 260529.
   F. Install panelboards plumb.
   G. Mount panelboards such that the highest position of any operating handle for circuit breakers or switches does not exceed 79 inches (2000 mm) above the floor or working platform.
   H. Provide grounding and bonding in accordance with Section 260526.
   I. Install all field-installed branch devices, components, and accessories.
   J. Provide filler plates to cover unused spaces in panelboards.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect and test in accordance with NETA ATS, except Section 4.
   C. Molded Case Circuit Breakers: Perform inspections and tests listed in NETA ATS, Section 7.6.1.1. Tests listed as optional are not required.
   D. Test GFCI circuit breakers to verify proper operation.
   E. Correct deficiencies and replace damaged or defective panelboards or associated components.

3.04 ADJUSTING
   A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.
   B. Adjust alignment of panelboard fronts.
3.05 CLEANING

A. Clean dirt and debris from panelboard enclosures and components according to manufacturer's instructions.

B. Repair scratched or marred exterior surfaces to match original factory finish.

**END OF SECTION 262416**
SECTION 262726 - WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Wall switches.
   B. Wall dimmers.
   C. Receptacles.
   D. Wall plates.

1.02 RELATED REQUIREMENTS
   A. Section 260533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS
   A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2017h.
   B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); 2017g.
   C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.
   E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2015).
   F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.
   G. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   I. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.
   L. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Coordinate the placement of outlet boxes with millwork, furniture, equipment, etc. installed under other sections or by others.
      2. Coordinate wiring device ratings and configurations with the electrical requirements of actual equipment to be installed.
      3. Coordinate the placement of outlet boxes for wall switches with actual installed door swings.
      4. Coordinate the installation and preparation of uneven surfaces, such as split face block, to provide suitable surface for installation of wiring devices.
      5. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide manufacturer's catalog information showing dimensions, colors, and configurations.

1.06 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Products: Listed, classified, and labeled as suitable for the purpose intended.
C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION
A. Store in a clean, dry space in original manufacturer's packaging until ready for installation.

PART 2 PRODUCTS

2.01 WIRING DEVICE APPLICATIONS
A. Provide wiring devices suitable for intended use and with ratings adequate for load served.
B. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.
C. Provide GFCI protection for receptacles installed within 6 feet (1.8 m) of sinks.

2.02 WIRING DEVICE FINISHES
A. Provide wiring device finishes as described below unless otherwise indicated.
B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.
C. Wiring Devices Installed in Wet or Damp Locations: White with specified weatherproof cover.

2.03 WALL SWITCHES
A. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.
B. Standard Wall Switches: Industrial specification grade, 20 A, 120/277 V with standard toggle type switch actuator and maintained contacts; single pole single throw, double pole single throw, or three way as indicated on the drawings.

2.04 WALL DIMMERS
A. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

2.05 RECEPTACLES
A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
   2. NEMA configurations specified are according to NEMA WD 6.
B. Convenience Receptacles:
   1. Standard Convenience Receptacles: Industrial specification grade, 20A, 125V, NEMA 5-20R; single or duplex as indicated on the drawings.
C. GFCI Receptacles:
   1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.
3. Weather Resistant GFCI Receptacles: Industrial specification grade, duplex, 20A, 125V, NEMA 5-20R, rectangular decorator style, listed and labeled as weather resistant type complying with UL 498 Supplement SE suitable for installation in damp or wet locations.

2.06 WALL PLATES
   A. Wall Plates: Comply with UL 514D.
      1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
      3. Screws: Metal with slotted heads finished to match wall plate finish.
   B. Nylon Wall Plates: Smooth finish, high-impact thermoplastic.
   C. Weatherproof Covers for Wet or Damp Locations: Gasketed, cast aluminum, with hinged lockable cover and corrosion-resistant screws; listed as suitable for use in wet locations while in use with attachment plugs connected and identified as extra-duty type.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.
   C. Verify that wall openings are neatly cut and will be completely covered by wall plates.
   D. Verify that final surface finishes are complete, including painting.
   E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
   F. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Provide extension rings to bring outlet boxes flush with finished surface.
   B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
   A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.
   B. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of wiring devices provided under this section.
      1. Mounting Heights: As indicated on the drawings.
      2. Orient outlet boxes for vertical installation of wiring devices unless otherwise indicated.
      3. Where multiple receptacles, wall switches, or wall dimmers are installed at the same location and at the same mounting height, gang devices together under a common wall plate.
   C. Install wiring devices in accordance with manufacturer's instructions.
   D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.
   E. Where required, connect wiring devices using pigtails not less than 6 inches (150 mm) long. Do not connect more than one conductor to wiring device terminals.
   F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.
   G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.
H. Provide GFCI receptacles with integral GFCI protection at each location indicated. Do not use feed-through wiring to protect downstream devices.
I. Install wiring devices plumb and level with mounting yoke held rigidly in place.
J. Install wall switches with OFF position down.
K. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.
L. Do not share neutral conductor on branch circuits utilizing wall dimmers.
M. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.
N. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.
O. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

**3.04 FIELD QUALITY CONTROL**

A. See Section 014000 - Quality Requirements, for additional requirements.
B. Inspect each wiring device for damage and defects.
C. Operate each wall switch, wall dimmer, and fan speed controller with circuit energized to verify proper operation.
D. Test each receptacle to verify operation and proper polarity.
E. Test each GFCI receptacle for proper tripping operation according to manufacturer’s instructions.
F. Correct wiring deficiencies and replace damaged or defective wiring devices.

**3.05 ADJUSTING**

A. Adjust devices and wall plates to be flush and level.

**3.06 CLEANING**

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

END OF SECTION 262726
SECTION 262816.16 - ENCLOSED SWITCHES

PART 2 PRODUCTS

1.01 ENCLOSED SAFETY SWITCHES

A. Description: Quick-make, quick-break enclosed safety switches listed and labeled as complying with UL 98; heavy duty; ratings, configurations, and features as indicated on the drawings.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless otherwise indicated, provide products suitable for continuous operation at the project location.

D. Horsepower Rating: Suitable for connected load.

E. Voltage Rating: Suitable for circuit voltage.

F. Short Circuit Current Rating:
   1. Provide enclosed safety switches, when protected by the fuses or supply side overcurrent protective devices to be installed, with listed short circuit current rating not less than the available fault current at the installed location as indicated on the drawings.

G. Provide with switch blade contact position that is visible when the cover is open.

H. Conductor Terminations: Suitable for use with the conductors to be installed.

I. Provide solidly bonded equipment ground bus in each enclosed safety switch, with a suitable lug for terminating each equipment grounding conductor.

J. Enclosures: Comply with NEMA 250, and list and label as complying with UL 50 and UL 50E.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor Clean, Dry Locations: Type 1.
      b. Outdoor Locations: Type 3R.
   2. Finish for Painted Steel Enclosures: Manufacturer's standard, factory applied grey unless otherwise indicated.

K. Provide safety interlock to prevent opening the cover with the switch in the ON position with capability of overriding interlock for testing purposes.

L. Heavy Duty Switches:
   2. Conductor Terminations:
      a. Provide mechanical lugs unless otherwise indicated.
      b. Lug Material: Aluminum, suitable for terminating aluminum or copper conductors.
   3. Provide externally operable handle with means for locking in the OFF position, capable of accepting three padlocks.

PART 3 EXECUTION

2.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the ratings of the enclosed switches are consistent with the indicated requirements.

C. Verify that mounting surfaces are ready to receive enclosed safety switches.

D. Verify that conditions are satisfactory for installation prior to starting work.

2.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.

D. Provide required support and attachment in accordance with Section 260529.

E. Install enclosed switches plumb.
F. Except where indicated to be mounted adjacent to the equipment they supply, mount enclosed switches such that the highest position of the operating handle does not exceed 79 inches (2000 mm) above the floor or working platform.

G. Provide grounding and bonding in accordance with Section 260526.

H. Identify enclosed switches in accordance with Section 260553.

2.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect and test in accordance with NETA ATS, except Section 4.
   C. Perform inspections and tests listed in NETA ATS, Section 7.5.1.1.
   D. Correct deficiencies and replace damaged or defective enclosed safety switches or associated components.

2.04 ADJUSTING
   A. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

2.05 CLEANING
   A. Clean dirt and debris from switch enclosures and components according to manufacturer's instructions.
   B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 262816.16
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Surge protective devices for service entrance locations.

1.02 RELATED REQUIREMENTS
   A. Section 260526 - Grounding and Bonding for Electrical Systems.
   B. Section 262416 - Panelboards.

1.03 ABBREVIATIONS AND ACRONYMS
   A. SPD: Surge Protective Device.

1.04 REFERENCE STANDARDS
   A. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2018.
   D. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.05 ADMINISTRATIVE REQUIREMENTS
   A. Coordination: Coordinate size and location of overcurrent device compatible with the actual surge protective device and location to be installed. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to ordering equipment.

1.06 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Include detailed component information, voltage, surge current ratings, repetitive surge current capacity, voltage protection rating (VPR) for all protection modes, maximum continuous operating voltage (MCOV), nominal discharge current (I-n), short circuit current rating (SCCR), connection means including any required external overcurrent protection, enclosure ratings, outline and support point dimensions, weight, service condition requirements, and installed features.

1.07 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.08 DELIVERY, STORAGE, AND PROTECTION
   A. Store in a clean, dry space in accordance with manufacturer's written instructions.

1.09 FIELD CONDITIONS
   A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.10 WARRANTY
   A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
PART 2 PRODUCTS

2.01 SURGE PROTECTIVE DEVICES - GENERAL REQUIREMENTS

A. Description: Factory-assembled surge protective devices (SPDs) for 60 Hz service; listed, classified, and labeled as suitable for the purpose intended; system voltage as indicated on the drawings.

B. Unless otherwise indicated, provide field-installed, externally-mounted or factory-installed, internally-mounted SPDs.

C. List and label as complying with UL 1449, Type 1 when connected on line side of service disconnect overcurrent device and Type 1 or 2 when connected on load side of service disconnect overcurrent device.

D. UL 1449 Voltage Protection Ratings (VPRs):
   1. 240/120V System Voltage: Not more than 1,000 V for L-N, L-G, and N-G modes and 1,200 V for L-L mode.

E. UL 1449 Maximum Continuous Operating Voltage (MCOV): Not less than 115% of nominal system voltage.

F. Enclosure Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
   1. Indoor clean, dry locations: Type 1.

G. Mounting for Field-installed, Externally Mounted SPDs: Unless otherwise indicated, as specified for the following locations:
   1. Provide surface-mounted SPD where mounted adjacent to surface-mounted equipment.

H. Equipment Containing Factory-installed, Internally Mounted SPDs: Listed and labeled as a complete assembly including SPD.
   1. Panelboards: See Section 262416.

2.02 SURGE PROTECTIVE DEVICES FOR SERVICE ENTRANCE LOCATIONS

A. Surge Protective Device:
   1. Protection Circuits: Field-replaceable modular or non-modular.
   2. Surge Current Rating: Not less than 120 kA per mode/240 kA per phase.
   3. UL 1449 Nominal Discharge Current (I-n): 20 kA.
   4. UL 1449 Short Circuit Current Rating (SCCR): Not less than the available fault current at the installed location as indicated on the drawings.
   5. Diagnostics:
      a. Protection Status Monitoring: Provide indicator lights to report the protection for each phase.
      b. Alarm Notification: Provide indicator light and audible alarm to report alarm condition. Provide button to manually silence audible alarm.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that the service voltage and configuration marked on the SPD are consistent with the service voltage and configuration at the location to be installed.

C. Verify that electrical equipment is ready to accept connection of the SPD and that installed overcurrent device is consistent with requirements of drawings and manufacturer's instructions.

D. Verify system grounding and bonding is in accordance with Section 260526, including bonding of neutral and ground for service entrance and separately derived systems where applicable. Do not energize SPD until deficiencies have been corrected.

E. Verify that conditions are satisfactory for installation prior to starting work.
3.02 INSTALLATION
   A. Perform work in accordance with NECA 1 (general workmanship).
   B. Install products in accordance with manufacturer's instructions.
   C. Arrange equipment to provide minimum clearances in accordance with manufacturer's instructions and NFPA 70.
   D. Provide conductors with minimum ampacity as indicated on the drawings, as required by NFPA 70, and not less than manufacturer's recommended minimum conductor size.
   E. Install conductors between SPD and equipment terminations as short and straight as possible, not exceeding manufacturer's recommended maximum conductor length. Twist conductors together to reduce inductance.
   F. Do not energize SPD until bonding of neutral and ground for service entrance and separately derived systems is complete in accordance with Section 260526 where applicable. Replace SPDs damaged by improper or missing neutral-ground bond.
   G. Disconnect SPD prior to performing any high potential testing. Replace SPDs damaged by performing high potential testing with SPD connected.

3.03 FIELD QUALITY CONTROL
   A. See Section 014000 - Quality Requirements, for additional requirements.
   B. Inspect and test in accordance with NETA ATS, except Section 4.

3.04 CLEANING
   A. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION 264300
SECTION 265100 - INTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior luminaires.
B. Exit signs.
C. Ballasts and drivers.

1.02 RELATED REQUIREMENTS

A. Section 260529 - Hangers and Supports for Electrical Systems.
B. Section 260533.16 - Boxes for Electrical Systems.
C. Section 262726 - Wiring Devices: Manual wall switches and wall dimmers.

1.03 REFERENCE STANDARDS

E. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.
F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
I. UL 1598 - Luminaires; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
   2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
   3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
   4. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.
   1. LED Luminaires:
a. Include estimated useful life, calculated based on IES LM-80 test data.

1.06 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND PROTECTION

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.08 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.09 WARRANTY

A. See Section 017800 - Closeout Submittals, for additional warranty requirements.

B. Provide three year manufacturer warranty for LED luminaires, including drivers.

C. Provide five year pro-rata warranty for batteries for emergency lighting units.

D. Provide ten year pro-rata warranty for batteries for self-powered exit signs.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

B. Substitutions: See Section 016000 - Product Requirements, except where individual luminaire types are designated with substitutions not permitted.

2.02 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:
   2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.

H. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
2.03 EXIT SIGNS
A. Description: Internally illuminated exit signs with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.
   1. Number of Faces: Single or double as indicated or as required for the installed location.
   2. Directional Arrows: As indicated or as required for the installed location.
B. Self-Powered Exit Signs:
   1. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.
   2. Battery: Sealed maintenance-free nickel cadmium unless otherwise indicated.
   3. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.
   4. Provide low-voltage disconnect to prevent battery damage from deep discharge.

2.04 BALLASTS AND DRIVERS
A. Ballasts/Drivers - General Requirements:
   1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
   2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.
B. Dimmable LED Drivers:
   1. Dimming Range: Continuous dimming from 100 percent to five percent relative light output unless dimming capability to lower level is indicated, without flicker.
   2. Control Compatibility: Fully compatible with the dimming controls to be installed.
      a. Wall Dimmers: See Section 2627.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that field measurements are as indicated.
B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
C. Verify that suitable support frames are installed where required.
D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
A. Provide extension rings to bring outlet boxes flush with finished surface.
B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
A. Coordinate locations of outlet boxes provided under Section 2605.16 as required for installation of luminaires provided under this section.
B. Install products in accordance with manufacturer's instructions.
C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 500 (commercial lighting) and NECA 502 (industrial lighting).
D. Provide required support and attachment in accordance with Section 2605.29.
E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.
F. Suspended Ceiling Mounted Luminaires:
   1. Do not use ceiling tiles to bear weight of luminaires.
2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
3. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.
4. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

G. Recessed Luminaires:
1. Install trims tight to mounting surface with no visible light leakage.

H. Install accessories furnished with each luminaire.
I. Bond products and metal accessories to branch circuit equipment grounding conductor.
J. Exit Signs:
1. Unless otherwise indicated, connect unit to unswitched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

K. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL
A. See Section 014000 - Quality Requirements, for additional requirements.
B. Inspect each product for damage and defects.
C. Operate each luminaire after installation and connection to verify proper operation.
D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.
E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.05 ADJUSTING
A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.
B. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect or authority having jurisdiction.

3.06 CLEANING
A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer’s instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 PROTECTION
A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 265100
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Exterior luminaires.
   B. Ballasts.

1.02 RELATED REQUIREMENTS
   A. Section 260529 - Hangers and Supports for Electrical Systems.
   B. Section 260533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS
   C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.
   E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
   F. UL 1598 - Luminaires; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS
   A. Coordination:
      1. Notify Architect of any conflicts or deviations from Contract Documents to obtain direction prior to proceeding with work.

1.05 SUBMITTALS
   A. See Section 013000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.
      1. LED Luminaires:
         a. Include estimated useful life, calculated based on IES LM-80 test data.

1.06 QUALITY ASSURANCE
   A. Conform to requirements of NFPA 70.
   B. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.07 DELIVERY, STORAGE, AND HANDLING
   A. Receive, handle, and store products according to NECA/IESNA 501 and manufacturer's written instructions.
   B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.08 WARRANTY
   A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
   B. Provide three year manufacturer warranty for all LED luminaires, including drivers.
PART 2 PRODUCTS

2.01 LUMINAIRE TYPES
   A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES
   A. Provide products that comply with requirements of NFPA 70.
   B. Provide products that are listed and labeled as complying with UL 1598, where applicable.
   C. Provide products listed, classified, and labeled as suitable for the purpose intended.
   D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.
   E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.
   F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.
   G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.
   H. LED Luminaires:
      1. Components: UL 8750 recognized or listed as applicable.
      2. Tested in accordance with IES LM-79 and IES LM-80.
      3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.
   I. Exposed Hardware: Stainless steel.

2.03 BALLASTS AND DRIVERS
   A. Ballasts/Drivers - General Requirements:
      1. Provide ballasts containing no polychlorinated biphenyls (PCBs).
      2. Minimum Efficiency/Efficacy: Provide ballasts complying with all current applicable federal and state ballast efficiency/efficacy standards.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that field measurements are as indicated.
   B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.
   C. Verify that suitable support frames are installed where required.
   D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.
   E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION
   A. Provide extension rings to bring outlet boxes flush with finished surface.
   B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.03 INSTALLATION
   A. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of luminaires provided under this section.
   B. Install products in accordance with manufacturer's instructions.
   C. Install luminaires in accordance with NECA/IESNA 501.
   D. Provide required support and attachment in accordance with Section 260529.
E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

G. Install accessories furnished with each luminaire.

H. Bond products and metal accessories to branch circuit equipment grounding conductor.

I. Install lamps in each luminaire.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect.

3.05 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect. Secure locking fittings in place.

3.06 CLEANING

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.07 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 265600
SECTION 271000 - STRUCTURED CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Communications system design requirements.
B. Communications pathways.
C. Copper cable and terminations.
D. Fiber optic cable and interconnecting devices.
E. Communications equipment room fittings.
F. Communications outlets.
G. Communications identification.

1.02 RELATED REQUIREMENTS

A. Section 260533.13 - Conduit for Electrical Systems.
B. Section 260536 - Cable Trays for Electrical Systems.
C. Section 260533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

A. EIA/ECA-310 - Cabinets, Racks, Panels, and Associated Equipment; Revision E, 2005.
C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
F. TIA-569 - Telecommunications Pathways and Spaces; 2015d, with Addendum (2016).
G. TIA-606 - Administration Standard for Telecommunications Infrastructure; 2017c.
J. UL 1863 - Communications-Circuit Accessories; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate requirements for service entrance and entrance facilities with Communications Service Provider.
   2. Coordinate the work with other trades to avoid placement of other utilities or obstructions within the spaces dedicated for communications equipment.
   3. Coordinate arrangement of communications equipment with the dimensions and clearance requirements of the actual equipment to be installed.

B. Arrange for Communications Service Provider to provide service.

C. Preinstallation Meeting: Convene one week prior to commencing work of this section to review service requirements and details with Communications Service Provider representative.
1.05 QUALITY ASSURANCE
A. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Store products in manufacturer's unopened packaging until ready for installation.
B. Keep stored products clean and dry.

1.07 WARRANTY
A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
B. Correct defective Work within a 2 year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 SYSTEM DESIGN
A. Provide a complete permanent system of cabling and pathways for voice and data communications, including cables, conduits and wireways, pull wires, support structures, enclosures and cabinets, and outlets.
   1. Comply with TIA-568 (SET) (cabling) and TIA-569 (pathways) (commercial standards).
   2. Comply with Communications Service Provider requirements.
   3. Provide fixed cables and pathways that comply with NFPA 70 and TIA-607 and are UL listed or third party independent testing laboratory certified.
   4. Provide connection devices that are rated for operation under conditions of 32 to 140 degrees F (0 to 60 degrees C) at relative humidity of 0 to 95 percent, noncondensing.
   5. In this project, the term plenum is defined as return air spaces above ceilings, inside ducts, under raised floors, and other air-handling spaces.

B. Main Distribution Frame (MDF): Centrally located support structure for terminating horizontal cables that extend to telecommunications outlets, functioning as point of presence to external service provider.
   1. Locate main distribution frame as indicated on the drawings.
   2. Capacity: As required to terminate all cables required by design criteria plus minimum 25 percent spare space.

C. Cabling to Outlets: Specified horizontal cabling, wired in star topology to distribution frame located at center hub of star; also referred to as "links".

2.02 PATHWAYS
A. Conduit: As specified in Section 260533.13; provide pull cords in all conduit.
B. Cable Trays: As specified in Section 260536.

2.03 COPPER CABLE AND TERMINATIONS
A. Copper Cable Terminations: Insulation displacement connection (IDC) type using appropriate tool; use screw connections only where specifically indicated.
B. Jacks and Connectors: Modular RJ-45, non-keyed, terminated with 110-style insulation displacement connectors (IDC); high impact thermoplastic housing; suitable for and complying with same standard as specified horizontal cable; UL 1863 listed.
   1. Performance: 500 mating cycles.
   2. Voice and Data Jacks: 8-position modular jack, color-coded for both T568A and T568B wiring configurations.

2.04 FIBER OPTIC CABLE AND INTERCONNECTING DEVICES
A. Fiber Optic Interconnecting Devices:
   1. Connector Type: Type LC.
   2. Connector Performance: 500 mating cycles, when tested in accordance with TIA-455-21.
3. Maximum Attenuation/Insertion Loss: 0.3 dB.

2.05 COMMUNICATIONS EQUIPMENT ROOM FITTINGS

A. Copper Cross-Connection Equipment:
   1. Connector Blocks for Category 5e and Up Cabling: Type 110 insulation displacement connectors; capacity sufficient for cables to be terminated plus 25 percent spare.
   2. Patch Panels for Copper Cabling: Sized to fit EIA/ECA-310 standard 19 inch (482.6 mm) wide equipment racks; 0.09 inch (2.2 mm) thick aluminum; cabling terminated on Type 110 insulation displacement connectors; printed circuit board interface.
      a. Jacks: Non-keyed RJ-45, suitable for and complying with same standard as cable to be terminated; maximum 48 ports per standard width panel.
      b. Capacity: Provide ports sufficient for cables to be terminated plus 25 percent spare.
      c. Labels: Factory installed laminated plastic nameplates above each port, numbered consecutively; comply with TIA-606.
      d. Provide incoming cable strain relief and routing guides on back of panel.

B. Backboards: Interior grade plywood without voids, 3/4 inch (19 mm) thick; UL-labeled fire-retardant.
   1. Size: As indicated on drawings.
   2. Do not paint over UL label.

C. Equipment Frames, Racks and Cabinets:
   1. Component Racks: EIA/ECA-310 standard 19 inch (482.6 mm) wide.
   2. Floor Mounted Racks: Aluminum or steel construction with corrosion resistant finish; vertical and horizontal cable management channels, top and bottom cable troughs, and grounding lug.

2.06 COMMUNICATIONS OUTLETS

A. Outlet Boxes: Comply with Section 260533.16.
   1. Provide depth as required to accommodate cable manufacturer’s recommended minimum conductor bend radius.

B. Wall Plates:
   1. Comply with system design standards and UL 514C.
   2. Accepts modular jacks/inserts.
   3. Capacity:

2.07 IDENTIFICATION PRODUCTS

A. Comply with TIA-606.

PART 3 EXECUTION

3.01 INSTALLATION - GENERAL

A. Comply with latest editions and addenda of TIA-568 (SET) (cabling), TIA-569 (pathways), TIA-607 (grounding and bonding), NECA/BICSI 568, NFPA 70, and SYSTEM DESIGN as specified in PART 2.

B. Comply with Communication Service Provider requirements.

C. Grounding and Bonding: Perform in accordance with TIA-607 and NFPA 70.

3.02 INSTALLATION OF PATHWAYS

A. Install pathways with the following minimum clearances:
   1. 48 inches (1220 mm) from motors, generators, frequency converters, transformers, x-ray equipment, and uninterruptible power systems.
   2. 12 inches (300 mm) from power conduits and cables and panelboards.
   3. 5 inches (125 mm) from fluorescent and high frequency lighting fixtures.
   4. 6 inches (150 mm) from flues, hot water pipes, and steam pipes.

B. Conduit, in Addition to Requirements of Section 260533.13:

C. Outlet Boxes:
1. Coordinate locations of outlet boxes provided under Section 260533.16 as required for installation of telecommunications outlets provided under this section.

3.03 INSTALLATION OF EQUIPMENT AND CABLING

A. Cabling:
   1. Do not bend cable at radius less than manufacturer's recommended bend radius; for unshielded twisted pair use bend radius of not less than 4 times cable diameter.
   2. Do not over-cinch or crush cables.
   3. Do not exceed manufacturer's recommended cable pull tension.
   4. When installing in conduit, use only lubricants approved by cable manufacturer and do not chafe or damage outer jacket.

B. Service Loops (Slack or Excess Length): Provide the following minimum extra length of cable, looped neatly:
   1. At Distribution Frames: 120 inches (3000 mm).
   2. At Outlets - Copper: 12 inches (305 mm).
   3. At Outlets - Optical Fiber: 39 inches (1000 mm).

C. Copper Cabling:
   1. Category 5e and Above: Maintain cable geometry; do not untwist more than 1/2 inch (12 mm) from point of termination.
   2. For 4-pair cables in conduit, do not exceed 25 pounds (110 N) pull tension.
   3. Use T568B wiring configuration.

D. Fiber Optic Cabling:
   1. Prepare for pulling by cutting outer jacket for 10 inches (250 mm) from end, leaving strength members exposed. Twist strength members together and attach to pulling eye.
   2. Support vertical cable at intervals as recommended by manufacturer.

E. Floor-Mounted Racks and Enclosures: Permanently anchor to floor in accordance with manufacturer's recommendations.

F. Identification:
   1. Use wire and cable markers to identify cables at each end.
   2. Use manufacturer-furnished label inserts, identification labels, or engraved wallplate to identify each jack at communications outlets with unique identifier.
   3. Use identification nameplate to identify cross-connection equipment, equipment racks, and cabinets.

3.04 FIELD QUALITY CONTROL

A. See Section 014000 - Quality Requirements, for additional requirements.

B. Comply with inspection and testing requirements of specified installation standards.

C. Visual Inspection:
   1. Inspect cable jackets for certification markings.
   2. Inspect cable terminations for color coded labels of proper type.
   3. Inspect outlet plates and patch panels for complete labels.

D. Testing - Copper Cabling and Associated Equipment:
   1. Test backbone cables after termination but before cross-connection.
   2. Test operation of shorting bars in connection blocks.
   3. Category 5e and Above Backbone: Perform near end cross talk (NEXT) and attenuation tests.
   4. Category 5e and Above Links: Perform tests for wire map, length, attenuation, NEXT, and propagation delay.

E. Testing - Fiber Optic Cabling:

F. Final Testing: After all work is complete, including installation of telecommunications outlets, and telephone dial tone service is active, test each voice jack for dial tone.

END OF SECTION 271000