PROJECT MANUAL
FOR

DENTAL CLINIC RENOVATION
1245 FULTON AVE.
COOS BAY, OREGON

FOR

CONFEDERATED TRIBES OF COOS, LOWER UMPQUA & Siuslaw Indians (CTCLUSI)
OREGON

APRIL 2019
PROJECT #17.10
DENTAL CLINIC RENOVATION
FOR
CONFEDERATED TRIBES OF COOS,
LOWER UMPQUA & SIUSLAW INDIANS
(CTCLUSI)

1245 FULTON AVENUE
COOS BAY, OREGON 97420

HGE, INC., ARCHITECTS, ENGINEERS & PLANNERS
333 SOUTH 4TH STREET
COOS BAY, OREGON 97420
(541) 269-1166
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March 2019

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ADVERTISEMENT FOR BIDS

Sealed bids for the Dental Clinic Renovation Project for the Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians (CTCLUSI) will be received at the Tribal Administration Building, 1245 Fulton Avenue, Coos Bay, Oregon, 97420, until 2:00 p.m. Thursday, May 9, 2019. Bids will be opened and read aloud thereafter in the Tribal Conference Room. Refer to Instruction to Bidders within the Contract Documents for more information.

Project scope includes but is not limited to a single-story building addition of approximately 1400 sf to provide additional dental exam/operatories and related support spaces, and expanded waiting area. Work also includes remodel of approximately 1900 sf of the existing dental clinic area. The work is to be staged by the contractor to allow the clinic to remain operational during the entire construction period. The project is located at the north end of the existing Tribal Administration Building at 1245 Fulton Avenue, Coos Bay, Oregon.

Bids are invited from qualified Indian and non-Indian owned general contractors. CTCLUSI's Indian Preference Policy shall apply to this solicitation and the award will be made to the lowest responsive bidder whose bid meets the requirements of the invitation for bids.

Contract Documents for this Work, including Instructions to Bidders and Bid Form, may be examined at the office of the Architect, HGE INC., Architects, Engineers & Planners, 333 South 4th Street, Coos Bay, Oregon 97420, phone (541) 269-1166, email: general@hge1.com, and at the following locations: Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians, Coos Bay office, 1245 Fulton Avenue, Coos Bay, Oregon, various plan centers, and on the HGE website at www.hge1.com/open-to-bid. General Contractors are encouraged to contact HGE, INC., by phone or email and register their interest in submitting a bid and to be included in the plan holders’ list. One set of drawings, specifications and contract documents may be obtained by prime bidders from HGE INC., Architects, Engineers, Surveyors & Planners, upon receipt of a refundable deposit of $100.00.

A mandatory pre-bid conference and walk-through of the project will be held at the project site at 1245 Fulton Avenue, Coos Bay, Oregon at 1:30 p.m., April 22, 2019. The pre-bid walk-through is mandatory for general contract bidders. Sub-contractors are encouraged to attend.

No bids will be considered unless fully completed in the manner provided in the Instructions to Bidders upon the official bid form provided by the Architect and accompanied by an unconditional certified check or a bid bond executed in favor of CTCLUSI in an amount not less than ten percent (10%) of the total amount of the bid, to be forfeited as fixed and liquidated damages should the bidder fail or neglect to enter into a contract and provide suitable bond for the faithful performance of the work in the event the contract is awarded.

The Owner reserves the right to reject any and all bids, and to waive any technicalities or informalities in connection therewith. No bidder may withdraw his bid after the hour set for opening thereof until the lapse of thirty (30) days from the bid opening.

By Order of:
Alexis Barry, Chief Executive Officer
Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians

Published:

The World
Date: April 10, 2019
Coos Bay, Oregon

Daily Journal of Commerce
Date: April 10, 2019
Portland, Oregon
SECTION 00-2113
INSTRUCTIONS TO BIDDERS

SUMMARY
1.01 SEE AIA DOCUMENT A701 (1997 EDITION), INSTRUCTIONS TO BIDDERS FOLLOWING THIS DOCUMENT.

1.02 RELATED DOCUMENTS
A. Document 00-1113 - Advertisement for Bids.
B. AIA Document A701 - 1997 INSTRUCTIONS TO BIDDERS
C. Document 00-2210 - Supplementary Instructions To Bidders
D. Document 00-4100 - Bid Form

INVITATION
2.01 BID SUBMISSION
A. Bids signed, executed, and dated will be received at the office of the Owner at or before 2:00 p.m. local standard time on the 11th day of April, 2019. Refer to Advertisement for Bids for additional information regarding delivery location.
B. Offers submitted after the above time shall be returned to the bidder unopened.
C. Offers will be opened privately immediately after the time for receipt of bids.
D. Amendments to the submitted offer will be permitted if received in writing prior to bid closing and if endorsed by the same party or parties who signed and sealed the offer.

BID DOCUMENTS AND CONTRACT DOCUMENTS
3.01 DEFINITIONS
A. Bid Documents: Contract Documents supplemented with Advertisement for Bids, Instructions to Bidders, Bid Form, Supplements To Bid Forms and Appendices and Bid securities identified.

3.02 AVAILABILITY
A. Bid Documents may be obtained at the office of Architect which is located at 333 South 4th Street, Coos Bay, Oregon, 97420. Phone: 541-269-1166, fax 541-269-1833.
B. One set of Bid Documents can be obtained by general contract bidders upon receipt of a refundable deposit, by cash or check, in the amount of $100.00 for one set.
C. Deposit will be refunded if Bid Documents are returned complete, undamaged, unmarked and reusable, no later than bid opening date. Failure to comply will result in forfeiture of deposit.
D. Architect's website document access:
   1. PDF digital copies of these documents are also available to Bidders via Architect's website at www.hge1.com/open-to-bid.
E. Bid Documents are made available only for the purpose of obtaining offers for this project. Their use does not grant a license for other purposes.

3.03 EXAMINATION
A. Bid Documents may be viewed at the Architect's office; HGE Inc., Architects, Engineers & Planners and various plan centers.
B. Upon receipt of Bid Documents verify that documents are complete. Notify Architect should the documents be incomplete.
C. Immediately notify Architect upon finding discrepancies or omissions in the Bid Documents.

3.04 INQUIRIES/ADDENDA
A. Direct questions to Architect, telephone 1-541-269-1166, fax 541-269-1833, email general@hge1.com.
INSTRUCTIONS TO BIDDERS
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B. Addenda may be issued during the bidding period. All Addenda become part of the Contract Documents. Include resultant costs in the Bid Amount. Addendums will be prepared by the Architect and Distributed by the Owners Representative.
C. Verbal answers are not binding on any party.
D. Clarifications requested by bidders must be in writing not less than 7 days before date set for receipt of bids. The reply will be in the form of an Addendum, a copy of which will be forwarded to known recipients.

SITE ASSESSMENT

4.01 SITE EXAMINATION
A. Examine the project site before submitting a bid. Refer to Article 2 Bidder’s Representations, AIA Document A701 Instructions to Bidders.

4.02 MANDATORY PREBID CONFERENCE
A. A bidders conference has been scheduled for 10:30 a.m. on the 29th day of March at the project location of 1245 Fulton Avenue, Coos Bay, Oregon, 97420. A job walk will occur immediately afterwards. The pre-bid conference and walk-thru is mandatory for general contractor bidders.
B. All general contract and subcontract bidders and suppliers are invited.
C. Representatives of Architect will be in attendance.
D. Information relevant to the Bid Documents will be recorded in an Addendum, issued to Bid Document recipients.

QUALIFICATIONS

5.01 BIDDER’S QUALIFICATIONS
A. Successful bidder must be registered with the Construction Contractor’s Board as required by ORS 701.035 to 701.055.
B. Successful bidder must demonstrate the bidder’s responsibility under ORS 279C.375 (3)(b).
C. Bidder is not required to be licensed for asbestos abatement under ORS 468A.720.

BID SUBMISSION

6.01 SUBMISSION PROCEDURE
A. Bidders shall be solely responsible for the delivery of their bids in the manner and time prescribed.
B. Submit one copy of the executed offer on the Bid Forms provided, signed and sealed with the required security in a closed opaque envelope, clearly identified with bidder’s name, project name and Owner’s name on the outside.
C. Bid Submission to include:
   1. Bid Form, filled out completely.
   2. Bid Security - cashiers check or bid bond.
D. An abstract summary of submitted bids will be made available to all bidders following bid opening.

BID ENCLOSURES/REQUIREMENTS

7.01 BID FORM REQUIREMENTS
A. Submitted bids must be accompanied by the following:
   1. Completed copy of Non-Collusion Affidavit Form
OFFER ACCEPTANCE/REJECTION

8.01 ACCEPTANCE OF OFFER

A. Owner reserves the right to accept or reject any or all offers and to waive any technicalities or informalities in connection therewith.

B. Owner may reject for good cause all bids upon finding that it is in the public interest to do so.

C. After acceptance by Owner, Architect on behalf of Owner, will issue to the successful bidder, a written letter of Contract Award.

D. The successful bidder will be required to furnish and pay for satisfactory Performance and Payment Bonds, or other assurance of completion.

END OF SECTION
Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians (CTCLUSI)
Dental Clinic Expansion
1245 Fulton Avenue, Coos Bay, Oregon 97420
Work includes 2,735 sq. ft. addition with major remodel of 3,573 sq. ft. dental clinic. The increase includes providing all-new dental exam treatment rooms with patient comfort and satisfaction as a goal. Work also includes remodeling the existing administration area at the north end of the building to increase circulation and floor plan efficiency.

THE OWNER:
(Name, legal status, address, and other information)

Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians (CTCLUSI)
1245 Fulton Avenue
Coos Bay, Oregon 97420
Telephone Number: 541-888-9577

THE ARCHITECT:
(Name, legal status, address, and other information)

HGE, Inc.
333 South 4th Avenue
Coos Bay, Oregon 97420
Telephone Number: 541-269-1166
Fax Number: 541-269-1833

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3 BIDDING DOCUMENTS
4 BIDDING PROCEDURES
5 CONSIDERATION OF BIDS
6 POST-BID INFORMATION
7 PERFORMANCE BOND AND PAYMENT BOND
8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An Additions and Deletions Report that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612™–2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.
§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents
§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)

Bidders shall obtain Bidding Documents via email, website, or paper copy.

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions
§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process
§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.
§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:
*(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)*

Bids shall be submitted as a paper copy.

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:
*(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)*

A bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

**ARTICLE 5 CONSIDERATION OF BIDS**

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.
§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.
(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

N/A

§ 7.2 Time of Delivery and Form of Bonds
§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS
§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

1. AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
   (Insert the complete AIA Document number, including year, and Document title.)
   N/A

   (Insert the complete AIA Document number, including year, and Document title.)
   N/A

3. AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
   (Insert the complete AIA Document number, including year, and Document title.)
   N/A

4. AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
   (Insert the date of the E203-2013.)
   Not used.
### PROCUREMENT AND CONTRACTING REQUIREMENTS

#### A. 00-0101 - Project Title Page

#### B. 00-0115 - Table of Contents

#### C. 00-1115 - Advertisement for Bids

#### D. 00-2113 - Instructions to Bidders

#### E. AIA Document A701 - 1997: Instructions to Bidders

#### F. 00-2210 - Supplementary Instructions to Bidders

#### G. 00-4000 - Procurement Forms and Supplements

#### H. Substitution Request Form (Bid Phase)

#### I. 00-4100 - Bid Form

#### J. Non-Combination Affidavit

#### K. 00-7200 - General Conditions

#### L. AIA Document A201 - 2007: General Conditions of the Contract for Construction

#### M. 00-7300 - Supplementary Conditions

### SPECIFICATIONS

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#### 2.03 DIVISION 03 - CONCRETE

| A. 03-2000 - Concrete Reinforcing |
| B. 03-3000 - Cast-in-Place Concrete |

#### 2.04 DIVISION 04 - MASONRY (NOT USED)

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Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

[ ] AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

[ ] The Sustainability Plan:

<table>
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[ ] Supplementary and other Conditions of the Contract:

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Other documents listed below:
(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

N/A
A bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

PAGE 7

N/A

... 

N/A

... 

N/A

...

(Insert the date of the E203-2013.)

Not used.

.5 Drawings

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.6 Specifications

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User Notes:

(795764048)
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Certification of Document's Authenticity
AIA® Document D401™ – 2003

I, , hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 11:57:54 ET on 04/11/2019 under Order No. 7945067786 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A701™ – 2018, Instructions to Bidders, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

(Signed)

(Title)

(Dated)
SECTION 00-2210
SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

GENERAL
1.01 THE FOLLOWING SUPPLEMENTS SHALL MODIFY, CHANGE, DELETE FROM OR ADD TO
THE AIA DOCUMENT A701-1997 INSTRUCTIONS TO BIDDERS. WHERE ANY ARTICLE OF
THE INSTRUCTIONS TO BIDDERS IS MODIFIED OR ANY PARAGRAPH, SUBPARAGRAPH,
OR CLAUSE THEREOF IS MODIFIED OR DELETED BY THESE SUPPLEMENTS, THE
UNALTERED PROVISIONS OF THAT ARTICLE, PARAGRAPH, SUBPARAGRAPH, OR CLAUSE
SHALL REMAIN IN EFFECT.

1.02 ARTICLE 1 DEFINITIONS ADD TO AS FOLLOWS:
A. The word Owner is the Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians
   (CTCLUSI).
B. The word Architect is HGE Inc. - Architects, Engineers & Planners.

1.03 ARTICLE 4 BIDDING PROCEDURE SUBPARAGRAPH 4.1.1, ADD THE FOLLOWING:
A. One copy of the Bid Form and other required bidding documents shall be submitted with all
   blank spaces in the form fully filled.

1.04 ARTICLE 4 BIDDING PROCEDURE SUBPARAGRAPH 4.2.2, ADD THE FOLLOWING:
A. Bid security in the form of Bid Bond issued by a Bonding Company acceptable to the Owner,
cashier’s check or certified check in an amount equal to 10% of the total bid, made payable to
the Owner shall be required.

1.05 ARTICLE 4 BIDDING PROCEDURE SUBPARAGRAPH 4.2.3, ADD THE FOLLOWING:
A. All Bidders will leave their bids open for a period of thirty (30) days after the date of bid opening.
No bid may be withdrawn during such period of time. Owner may accept any Bid in accordance
with the Instructions to Bidders within such thirty (30) day period.

1.06 ARTICLE 5 CONSIDERATION OF BIDS ADD SUBPARAGRAPH 5.3.3:
A. If the Contractor is to be awarded, Owner will provide written Notice of Intent to Award to all
Bidders of the Owner's intent to award the Contract. Owner's award shall not be final until the
later of the following:
   1. Five (5) days after the date of the Notice of Intent; or
   2. The Owner provides a written response to all timely-filed protests that denies the protest
      and affirms the award.

1.07 ARTICLE 5 CONSIDERATION OF BIDS ADD SUBPARAGRAPH 5.3.4:
A. Goods or services manufactured or produced in the State of Oregon to receive preference, all
factors being equal.

1.08 ARTICLE 6 POST BID INFORMATION DELETE SUBPARAGRAPH 6.1:
A. Contractor's Qualification Statement.

1.09 ARTICLE 7 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND
SUBPARAGRAPH 7.2.2:
A. A Performance Bond and Labor and Material Payment Bond shall be required. Contractor shall
provide separate Performance Bond and Labor and Material Payment Bond made payable to
the Owner issued by a Corporation legally licensed to transact business in the State of Oregon.
Corporation issuing such a bond must comply with applicable Oregon Statutes for public work
and be satisfactory to the Owner. The bonds are to be in the amount of 100% of the contract
sum to assure the Owner of full and prompt performance of the Contract.
1.10 ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR
SUBPARAGRAPH 8.1.1 ADD THE FOLLOWING:

A. The Contractor shall within ten (10) days after notification in writing of the Owner’s Notice to award a Contract, execute and return to the Owner the Form of Agreement, the Bonds and all applicable Certificates of Insurance.

1.11 CTCLUSI SUPPLEMENTARY INSTRUCTIONS TO BIDDERS:
A. STANDARD TERMS

1. It is the sole responsibility of the Bidder to provide all information requested and meet all requirements of these Construction Documents. CTCLUSI has no express or implied obligation to reimburse any Bidder for any expenses incurred in preparing proposals in response to this request.

2. The successful Bidder and all personnel assigned to perform the services covered in these Construction Documents shall be licensed to practice in the State of Oregon and shall pass a criminal background check.

3. The Bidder shall be responsible for all taxes, fees and permits associated with or required of these Construction Documents.

4. The Bidder shall be responsible for the proper disposal of any waste generated by these Construction Documents.

5. The successful Bidder shall serve CTCLUSI as an independent contractor and shall not be deemed an employee or representative of CTCLUSI. The Bidder understands and agrees that the successful Bidder will be an Independent Contractor for whom no Federal or State Income Tax will be deducted by CTCLUSI and for whom no retirement benefits, Medicare, survivor benefit insurance, group life insurance, vacation, sick leave, worker’s compensation, unemployment and similar benefits available to CTCLUSI employees will accrue. The Bidder further understands that annual information returns as required by the Internal Revenue Code or State of Oregon Income Tax Law will be furnished to the successful Bidder for Bidder’s income tax records.

6. The Bidder shall not sublet, sell, transfer, assign or otherwise dispose of any agreement related to the Construction Documents or any portion thereof, or of his right, title or interest therein, without written request to and written consent of CTCLUSI, such consent being in the sole discretion of CTCLUSI. No subcontracts, transfer or agreement shall in any case release the Bidder of his liability under this agreement.

7. CTCLUSI has the right to terminate, without fault, any contract related to these Construction Documents in whole or in part if CTCLUSI determines, in its sole discretion, that such termination is in the best interest of CTCLUSI. Any such termination shall be effected by delivery to the Bidder of a Notice of Termination specifying the extent of such termination.

8. The Bidder agrees to indemnify, defend and save harmless CTCLUSI, its officers, agents and employees from any and all claims and losses accruing or resulting to any and all contractors, subcontractors, materialmen, laborer and any other person, firm or corporation furnishing or supplying work, services, materials or supplies in connection with the performance of any resulting contract related to these Construction Documents and form any and all claims and losses accruing or resulting to any person, firm or corporation who may be injured or damaged by the Bidder in the performance of such contract and against any liability including costs and expenses for violation of property rights, copyrights or rights of privacy, arising out of publication, translation, reproduction, delivery, performance, use or disposition of any data furnished under such contract or based on any libelous or other unlawful matter contained in such data.

9. These Construction Documents and any resulting contract shall be governed by and interpreted under all applicable laws, ordinances, rules, regulations and resolutions of the Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians. The Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians Tribal Court shall be deemed to have jurisdiction over any disputes under these Contract Documents and any resulting contract.

B. INDIAN PREFERENCE
1. The work to be performed under these Construction Documents is on a project subject to Section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b). Section 7(b) requires that to the greatest extent feasible:
   a. Preferences and opportunities for training and employment shall be given to Indians;
   and
   b. Preferences in the award of contracts and subcontracts shall be given to Indian organizations and Indian-owned economic enterprises.

   END OF SECTION
SUBSTITUTION REQUEST
(During the Bidding Phase)

Project: ________________________________  Substitution Request Number: ________________________________

 toch: ________________________________  From: ________________________________

To: ________________________________  Date: ________________________________

Re: ________________________________  A/E Project Number: ________________________________

Specification Title: ________________________________  Description: ________________________________

Section: ____________________  Page: ____________________  Article/Paragraph: ____________________

Proposed Substitution:
Manufacturer: ________________________________  Address: ________________________________  Phone: ________________________________
Trade Name: ________________________________  Model No.: ________________________________

Attached data includes product description, specifications, drawings, photographs, and performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The Undersigned certifies:
• Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
• Same warranty will be furnished for proposed substitution as for specified product.
• Same maintenance service and source of replacement parts, as applicable, is available.
• Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
• Proposed substitution does not affect dimensions and functional clearances.
• Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.

Submitted by: ________________________________  Signed by: ________________________________
Firm: ________________________________  Telephone: ________________________________
Address: ________________________________

A/E’s REVIEW AND ACTION

☐ Substitution approved - Make submittals in accordance with Specification Section 01330.
☐ Substitution approved as noted - Make submittals in accordance with Specification Section 01330.
☐ Substitution rejected - Use specified materials.
☐ Substitution Request received too late - Use specified materials.

Signed by: ________________________________  Date: ________________________________

Supporting Data Attached:  ☐ Drawings  ☐ Product Data  ☐ Samples  ☐ Tests  ☐ Reports  ☐________
SECTION 00-4100

BID FORM

THE PROJECT AND THE PARTIES

1.01 TO:

Owner: Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians (CTCLUSI)
1245 Fulton Avenue, Coos Bay, Oregon  97420

1.02 FOR:  DENTAL CLINIC RENOVATION PROJECT

Project Location:  1245 Fulton Avenue, Coos Bay, Oregon 97420 at the CTCLUSI Administration building.

1.03 DATE: __________________________ (BIDDER TO ENTER DATE)

1.04 SUBMITTED BY:

NAME OF FIRM (PLEASE PRINT): ______________________________________________

1.05 GENERAL

A. The Bidder declares that they have carefully examined the Contract Documents for the construction of the proposed improvements; that the Bidder has personally inspected the contemplated construction area, that the Bidder has satisfied themselves as to the quantities of materials, items of equipment, possible difficulties, and conditions of work involved.

B. The bidder further declares that they are registered with the Construction Contractor's Board as required by ORS 701.35 to 701.55, and possess such additional licenses and certifications as required by law for the performance of the work proposed herein.

C. The subcontractor(s) performing work as described in ORS 701.005(2) will be registered with the Construction Contractors Board in accordance with ORS 701.035 to 701.055 before the subcontractor(s) commence work under the Contract.

D. INDIAN PREFERENCE:
   1. Bidder _______is / ________is not (check one) a Certified Minority Business Enterprise. If yes, Bidder must provide copy of Certification of Minority Business Enterprise Program.

E. REVIEW OF BID QUOTATIONS:
   1. CTCLUSI reserves the right, in its sole discretion, to reject any and all bids if deemed to be in the best interest of CTCLUSI. The award will be made to the lowest responsive Bidder whose bid meets the requirements of these Construction Documents.
   2. The successful Bidder will be required to enter into a contract with CTCLUSI according to the terms of the successful bid and these Construction Documents. The successful Bidder will be required to maintain applicable liability and workers compensation insurance.
   3. CTCLUSI will apply Indian preference to bid quotations, as applicable, in accordance with Chapter VII of the Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians Tribal Code and CTCLUSI Approved Procurement Policy (found within the Project Manual).

F. Bidder certifies that the provisions required by ORS 279C.836, unless exempt under Sections (4), (7), (8), or (9), before starting work on this Contract, or any subcontract hereunder, Contractor and all subcontractors shall have on file with the Construction Contractor's Board a public works bond with corporate surety authorized to do business in the State of Oregon in the amount of $30,000.

G. The Bidder agrees that if this Proposal is accepted, the Bidder will, within ten (10) calendar days after receiving contract forms, execute the Agreement between Owner and Contractor as specified, and deliver to the Owner the Performance and Labor and Payment Bonds required herein.
1.06 BASIC BID:
   A. The undersigned bidder, in submitting his bid, authorizes the Owner to evaluate the bid and make a single award on the basis of the bid.
   B. After having examined all of the contract documents as prepared by HGE Inc., Architects, Engineers & Planners, 333 South 4th Street, Coos Bay, Oregon 97420, we do hereby propose to furnish labor and materials to complete the work required by said documents for the following fixed sum:
      (Fill in lump sum amount for each bid unit, in written words in space provided, and in numerals within parenthesis.)
      ________________________________________________________________Dollars and __________________________ Cents ($______________________) complete.

Bidder further agrees to be bound by the entire Contract Documents, including:
   Advertisement for Bids
   Issued Addenda
   Instructions to Bidders - AIA A701 and Supplemental Instructions
   Bid Form (this document)
   Subcontractor Disclosure Form
   General Conditions - AIA 201 and Supplementary Conditions
   Contract for Construction:  Owner-Contractor Agreement - AIA 101
   Performance and Payment Bonds
   Technical Specifications
   Plans/Drawings
   Issued Change Orders and Architects Supplemental Instructions
   All Applicable State and Federal Laws
   All Applicable Indian Tribe Laws
   CTCLUSI Approved Procurement Policy

1.07 BID SECURITY
   A. Bid security in the form of a certified check of Bid Bond in the amount of 10% of the bid amount is enclosed per ORS 279C.385. The undersigned agrees that Bid Security will be left in escrow with the Owner and that the amount thereof is the measure of liquidated damages which Owner will sustain by failure of the undersigned to deliver and execute the Contract or provide Performance and Payment Bonds and may become the property of the Owner at Owner’s option. If this bid is not accepted within thirty (30) days of the time set for the opening of bids or if the undersigned executes and timely delivers said contract and the Performance and Payment Bonds, the Bid Security will be returned.

1.08 COMPLETION DATE AND LIQUIDATED DAMAGES
   A. It is understood that time is of the essence in the execution of this Contract in order to avoid undue hardship upon the Owner. It is the desire of the Owner to issue a Notice to Proceed upon successful review of the lower qualified bidder and have the project completed within _______ (_____) calendar days.
   B. The Undersigned agrees that he will have the work Substantially Complete on or before __________ calendar days after Notice to Proceed (Bidder to fill in number of days he/she will require to perform the Work and this will be the agreed upon construction time period).
   C. The Contractor agrees that said Work shall be prosecuted regularly, diligently, at such rate of progress as will ensure Substantial Completion thereof within the time specified. It is expressly understood and agreed, by the Contractor and the Owner, that the time for the completion of the
Work described herein is reasonable taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

1.09 OWNER RIGHTS
   A. The Owner reserves the right to reject any or all bids and to waive all informalities.

1.10 ADDENDA
   A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
      1. Addendum # ______ Dated ________________.
      2. Addendum # ______ Dated ________________.
      3. Addendum # ______ Dated ________________.

1.11 BID FORM SIGNATURE(S)
   A. Name of Firm (please print):______________________________________________________
   B. Mailing Address:_______________________________________________________________
   C. Physical Address (if different):_________________________________________________
   D. Construction Contractor Board Registration Number:______________________________
   E. Telephone Number:____________________________________________________________
   F. Fax Number:__________________________________________________________________
   G. Email Address:________________________________________________________________
   H. Signature (if bid is by a partnership, one of the partners must sign):

   _____________________________________________________________________________
   I. Name and Official Capacity of Signatory (please print):

   _____________________________________________________________________________
   J. If Corporation, Attest (Secretary of Corporation):

   _____________________________________________________________________________
   K. SEAL (if Corporation):

   _____________________________________________________________________________
END OF SECTION
NON-COLLUSION AFFIDAVIT

STATE OF  )
County of  ) ss.

I state that I am _________________________ of ______________________________ and that __________________________ (Title) __________________________ (Name of Firm)

I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

1. The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or argument with any other contractor, bidder or potential bidder, except as disclosed on the attached appendix.

2. That neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

3. No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form or complimentary bid.

4. The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complimentary or other noncompetitive bid.

5. (Name of Firm), its affiliates, directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as described on the attached appendix.

I state that __________________________ (Name of Firm), understands and acknowledges that the above representations are material and important and will be relied on by the CTCLUSI in awarding the contract(s) for which this bid is submitted. I understand, and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the CTCLUSI of the true facts relating to the submission of bids for this contract.

_______________________________
(Name of Company/Position)
SECTION 00-7200
GENERAL CONDITIONS

FORM OF GENERAL CONDITIONS
1.01 THE GENERAL CONDITIONS APPLICABLE TO THIS CONTRACT IS ATTACHED FOLLOWING THIS PAGE:

RELATED REQUIREMENTS
2.01 SECTION 00-7300 - SUPPLEMENTARY CONDITIONS.
SUPPLEMENTARY CONDITIONS
3.01 REFER TO DOCUMENT 00-7300 - SUPPLEMENTARY CONDITIONS FOR AMENDMENTS TO THESE GENERAL CONDITIONS.

END OF SECTION
## General Conditions of the Contract for Construction

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**ADDITIONS AND DELETIONS:**
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.
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ARTICLE 1  GENERAL PROVISIONS
§ 1.1 BASIC DEFINITIONS
§ 1.1.1 THE CONTRACT DOCUMENTS
The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor’s bid or proposal, or portions of Addenda relating to bidding requirements.

§ 1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect’s consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect’s consultants or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect’s duties.

§ 1.1.3 THE WORK
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. The Work may constitute the whole or a part of the Project.

§ 1.1.4 THE PROJECT
The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by separate contractors.

§ 1.1.5 THE DRAWINGS
The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

§ 1.1.6 THE SPECIFICATIONS
The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 INSTRUMENTS OF SERVICE
Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect’s consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 INITIAL DECISION MAKER
The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS
§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.
§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 CAPITALIZATION
Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 INTERPRETATION
In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE
§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce the Instruments of Service provided to them solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers may not use the Instruments of Service on other projects or for additions to this Project outside the scope of the Work without the specific written consent of the Owner, Architect and the Architect's consultants.

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM
If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

ARTICLE 2 OWNER
§ 2.1 GENERAL
§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER
§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or


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the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.2 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.2.3 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.2.4 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner’s control and relevant to the Contractor’s performance of the Work with reasonable promptness after receiving the Contractor’s written request for such information or services.

§ 2.2.5 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.3.2.

§ 2.3 OWNER’S RIGHT TO STOP THE WORK
If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.4 OWNER’S RIGHT TO CARRY OUT THE WORK
If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner’s expenses and compensation for the Architect’s additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR
§ 3.1 GENERAL
§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor’s authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect’s administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.
§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor’s review is made in the Contractor’s capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor’s notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall make Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor’s best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner shall be solely responsible for any loss or damage arising solely from those Owner-required means, methods, techniques, sequences or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor’s employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other
§ 3.4.2 Except in the case of minor changes in the Work authorized by the Architect in accordance with Sections 3.12.8 or 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor’s employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 WARRANTY
The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor’s warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.6 TAXES
The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions. If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect’s determination or recommendation, that party may proceed as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume...
the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 ALLOWANCES
§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,
   .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
   .2 Contractor’s costs for unloading and handling at the site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
   .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor’s costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 SUPERINTENDENT
§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner’s consent, which shall not unreasonably be withheld or delayed.

§ 3.10 CONTRACTOR’S CONSTRUCTION SCHEDULES
§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner’s and Architect’s information a Contractor’s construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

§ 3.10.2 The Contractor shall prepare a submittal schedule, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, and shall submit the schedule(s) for the Architect’s approval. The Architect’s approval shall not unreasonably be delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor’s construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.
§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE
The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
§ 3.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. Their purpose is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve and submit to the Architect Shop Drawings, Product Data, Samples and similar submittals required by the Contract Documents in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of separate contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples or similar submittals until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect’s approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Architect’s approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such written notice, the Architect’s approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor’s responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be
required to provide professional services in violation of applicable law. If professional design services or
certifications by a design professional related to systems, materials or equipment are specifically required of the
Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria
that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a
properly licensed design professional, whose signature and seal shall appear on all drawings, calculations,
specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings
and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear
such professional’s written approval when submitted to the Architect. The Owner and the Architect shall be entitled
to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or
provided by such design professionals, provided the Owner and Architect have specified to the Contractor all
performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will
review, approve or take other appropriate action on submittals only for the limited purpose of checking for
conformance with information given and the design concept expressed in the Contract Documents. The Contractor
shall not be responsible for the adequacy of the performance and design criteria specified in the Contract
Documents.

§ 3.13 USE OF SITE
The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes,
rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably
cumber the site with materials or equipment.

§ 3.14 CUTTING AND PATCHING
§ 3.14.1 The Contractor shall be responsible for cutting, fitting or patching required to complete the Work or to make
its parts fit together properly. All areas requiring cutting, fitting and patching shall be restored to the condition
existing prior to the cutting, fitting and patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed
construction of the Owner or separate contractors by cutting, patching or otherwise altering such construction, or by
excavation. The Contractor shall not cut or otherwise alter such construction by the Owner or a separate contractor
except with written consent of the Owner and of such separate contractor; such consent shall not be unreasonably
withheld. The Contractor shall not unreasonably withhold from the Owner or a separate contractor the Contractor’s
consent to cutting or otherwise altering the Work.

§ 3.15 CLEANING UP
§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or
rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste
materials, rubbish, the Contractor’s tools, construction equipment, machinery and surplus materials from and about
the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and Owner
shall be entitled to reimbursement from the Contractor.

§ 3.16 ACCESS TO WORK
The Contractor shall provide the Owner and Architect access to the Work in preparation and progress wherever
located.

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS
The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement
of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but
shall not be responsible for such defense or loss when a particular design, process or product of a particular
manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are
contained in Drawings, Specifications or other documents prepared by the Owner or Architect. However, if the
Contractor has reason to believe that the required design, process or product is an infringement of a copyright or a
patent, the Contractor shall be responsible for such loss unless such information is promptly furnished to the
Architect.
§ 3.18 INDEMNIFICATION
§ 3.18.1 To the fullest extent permitted by law the Contractor shall indemnify and hold harmless the Owner, Architect, Architect’s consultants, and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 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 Section 3.18.1 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’ compensation acts, disability benefit acts or other employee benefit acts.

ARTICLE 4 ARCHITECT
§ 4.1 GENERAL
§ 4.1.1 The Owner shall retain an architect lawfully licensed to practice architecture or an entity lawfully practicing architecture in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 4.1.2 Duties, responsibilities and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified or extended without written consent of the Owner, Contractor and Architect. Consent shall not be unreasonably withheld.

§ 4.1.3 If the employment of the Architect is terminated, the Owner shall employ a successor architect as to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 4.2 ADMINISTRATION OF THE CONTRACT
§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner’s representative during construction until the date the Architect issues the final Certificate For Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor’s rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and report to the Owner (1) known deviations from the Contract Documents and from the most recent construction schedule submitted by the Contractor, and (2) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor’s failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of and will not be responsible for acts or omissions of the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.
§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION
Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.
§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect’s response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term “Subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term “Subcontractor” does not include a separate contractor or sub contractors of a separate contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term “Sub-subcontractor” is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor’s Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsibly in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor’s Work, which the Contractor, by these Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may...
be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS
§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

1. assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor in writing; and

2. assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor’s rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor’s compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon such assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor’s obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
§ 6.1 OWNER’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS
§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner’s own forces, and to award separate contracts in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to those including those portions related to insurance and waiver of subrogation. If the Contractor fails to complete the work or engage in a violation of the Contract, the Owner may be entitled to recover damages for the failure.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term “Contractor” in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner’s own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner’s own forces, the Owner shall be deemed to be subject to the same obligations and to have the same rights that apply to the Contractor under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

§ 6.2 MUTUAL RESPONSIBILITY
§ 6.2.1 The Contractor shall afford the Owner and separate contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor’s construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor’s Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that

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the Owner’s or separate contractor’s completed or partially completed construction is fit and proper to receive the Contractor’s Work, except as to defects not then reasonably discoverable.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a separate contractor because of the Contractor’s delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a separate contractor’s delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or separate contractors as provided in Section 10.2.5.

§ 6.2.5 The Owner and each separate contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 OWNER’S RIGHT TO CLEAN UP
If a dispute arises among the Contractor, separate contractors and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7  CHANGES IN THE WORK
§ 7.1 GENERAL
§ 7.1.1 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 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect; and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 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.

§ 7.2 CHANGE ORDERS
§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor and Architect stating their agreement upon all of the following:
1. The change in the Work;
2. The amount of the adjustment, if any, in the Contract Sum; and
3. The extent of the adjustment, if any, in the Contract Time.

§ 7.3 CONSTRUCTION CHANGE DIRECTIVES
§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum 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 Contract Sum and Contract Time being adjusted accordingly.

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

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one 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
§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 7.3.5 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect 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 Contract Sum or Contract Time.

§ 7.3.6 A Construction Change Directive signed by the Contractor indicates the Contractor’s agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment 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 Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 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 premiums for all bonds and insurance, 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.

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

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect’s professional judgment, to be reasonably justified. The Architect’s interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 MINOR CHANGES IN THE WORK
The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.
ARTICLE 8  TIME
§ 8.1 DEFINITIONS
§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 PROGRESS AND COMPLETION
§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 DELAYS AND EXTENSIONS OF TIME
§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner; or by changes ordered in the Work; or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor’s control; or by delay authorized by the Owner pending mediation and arbitration; or by other causes that the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9  PAYMENTS AND COMPLETION
§ 9.1 CONTRACT SUM
The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.2 SCHEDULE OF VALUES
Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor’s Applications for Payment.

§ 9.3 APPLICATIONS FOR PAYMENT
§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2., for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor’s right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.
§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 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 suitably 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.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

1. defective Work not remedied;
2. third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;

Init.

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User Notes:
.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
.5 damage to the Owner or a separate contractor;
.6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
.7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.3 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or material or equipment suppliers to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Architect will reflect such payment on the next Certificate for Payment.

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor’s portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

§ 9.6.5 Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.7 FAILURE OF PAYMENT

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor’s Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days’ written notice to the Owner and Architect,
stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 SUBSTANTIAL COMPLETION
§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 PARTIAL OCCUPANCY OR USE
§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT
§ 9.10.1 Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the
Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect’s knowledge, information and belief, and on the basis of the Architect’s on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect’s final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor’s being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner’s property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys’ fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from .
.1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
.2 failure of the Work to comply with the requirements of the Contract Documents; or
.3 terms of special warranties required by the Contract Documents.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY
§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS
The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 SAFETY OF PERSONS AND PROPERTY
§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury or loss to .
.1 employees on the Work and other persons who may be affected thereby;
.2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody or control of the Contractor or the Contractor’s Subcontractors or Sub-subcontractors; and
.3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.
§ 10.2.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss.

§ 10.2.3 The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY
If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 HAZARDOUS MATERIALS
§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and report the condition to the Owner and Architect in writing.

§ 10.3.2 Upon receipt of the Contractor's written notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up.
§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect’s consultants and agents and employees of any of them from and against claims, damages, losses and expenses, including but not limited to attorneys’ fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for materials or substances required by the Contract Documents, except to the extent of the Contractor’s fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall indemnify the Owner for the cost and expense the Owner incurs (1) for remediation of a material or substance the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner’s fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall indemnify the Contractor for all cost and expense thereby incurred.

§ 10.4 EMERGENCIES
In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor’s discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS
§ 11.1 CONTRACTOR’S LIABILITY INSURANCE
§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor’s operations and completed 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’ compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
.2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor’s employees;
.3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor’s employees;
.4 Claims for damages insured by usual personal injury liability coverage;
.5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
.6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
.7 Claims for bodily injury or property damage arising out of completed operations; and
.8 Claims involving contractual liability insurance applicable to the Contractor’s obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor’s completed operations coverage, until the expiration of the period for correction of claims made under the Policy. The insurance required by Section 11.1.2 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater.
of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days’ prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect’s Consultants as additional insureds for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.

§ 11.2 OWNER’S LIABILITY INSURANCE
The Owner shall be responsible for purchasing and maintaining the Owner’s usual liability insurance.

§ 11.3 PROPERTY INSURANCE
§ 11.3.1 Unless otherwise provided, the Owner shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder’s risk “all-risk” or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an “all-risk” or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect’s and Contractor’s services and expenses required as a result of such insured loss.

§ 11.3.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance that will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

§ 11.3.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or
otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

§ 11.3.2 BOILER AND MACHINERY INSURANCE
The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

§ 11.3.3 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 use of the Owner’s property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner’s property, including consequential losses due to fire or other hazards however caused.

§ 11.3.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

§ 11.3.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Section 11.3.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

§ 11.3.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Section 11.3. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days’ prior written notice has been given to the Contractor.

§ 11.3.7 WAIVER OF SUBROGATION
The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect’s consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect’s consultants, separate contractors described in Article 6, 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 or otherwise. 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.

§ 11.3.8 A loss insured under the Owner’s property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner’s duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the
Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved in the manner selected by the Owner and Contractor as the method of binding dispute resolution in the Agreement. If the Owner and Contractor have selected arbitration as the method of binding dispute resolution, the Owner as fiduciary shall make settlement with insurers or, in the case of a dispute over distribution of insurance proceeds, in accordance with the directions of the arbitrators.

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND
§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

§ 11.4.2 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 authorize a copy to be furnished.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK
§ 12.1 UNCOVERING OF WORK
§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK
§ 12.2.1 BEFORE OR AFTER SUBSTANTIAL COMPLETION
The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, whether discovered before or after Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 AFTER SUBSTANTIAL COMPLETION
§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.
§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction, whether completed or partially completed, of the Owner or separate contractors caused by the Contractor’s correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor’s liability with respect to the Contractor’s obligations other than specifically to correct the Work.

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK
If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS
§ 13.1 GOVERNING LAW
The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS
§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner’s rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate such assignment.

§ 13.3 WRITTEN NOTICE
Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES
§ 13.4.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

§ 13.4.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval or acquiescence in a breach there under, except as may be specifically agreed in writing.


User Notes:
§ 13.5 TESTS AND INSPECTIONS
§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner’s expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect’s services and expenses shall be at the Contractor’s expense.

§ 13.5.4 Required certificates of testing, inspection or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.5.5 If the Architect is to observe tests, inspections or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.5.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.6 INTEREST
Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

§ 13.7 TIME LIMITS ON CLAIMS
The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT
§ 14.1 TERMINATION BY THE CONTRACTOR
§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 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 of a court or other public authority having jurisdiction that requires all Work to be stopped;

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

Init.


User Notes:
3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or

4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor’s request, reasonable evidence as required by Section 2.2.1.

§ 14.1.2 The Contractor may terminate the Contract if, 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, repeated suspensions, delays or interruptions of the entire Work by the Owner as described in Section 14.3 constitute in the aggregate more than 100 percent of the total number of days of work for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days’ written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with the Contractor because the Owner has repeatedly failed to fulfill the Owner’s obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days’ written notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE
§ 14.2.1 The Owner may terminate the Contract if the Contractor
  1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
  2 fails to make payment to Subcontractors for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors;
  3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
  4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the above reasons exist, the Owner, upon certification by the Initial Decision Maker that sufficient cause exists to justify such action, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor’s surety, if any, seven days’ written notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:
  1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereof owned by the Contractor;
  2 Accept assignment of subcontracts pursuant to Section 5.4; and
  3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect’s services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE
§ 14.3.1 The Owner may, 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.
§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay or interruption as described in Section 14.3.1. Adjustment of the Contract Sum shall include profit. 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

.2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE
§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause.

§ 14.4.2 Upon receipt of written notice from the Owner of such termination for the Owner’s convenience, the Contractor shall

.1 cease operations as directed by the Owner in the notice;

.2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and

.3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner’s convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES
§ 15.1 CLAIMS
§ 15.1.1 DEFINITION
A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS
Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE
Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST
If the Contractor wishes to make a Claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME
§ 15.1.5.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, written notice as provided herein shall be given. The Contractor’s Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.5.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.
§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES
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; and

2. damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION
§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of such request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.
§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor’s default, the Owner may, but is not obligated to, notify the surety and request the surety’s assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic’s lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 MEDIATION
§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.6 shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 The parties shall share the mediator’s fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 ARBITRATION
§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 CONSOLIDATION OR JOINDER
§ 15.4.4.1 Either party, at its sole discretion, may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Either party, at its sole discretion, may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an
additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as the Owner and Contractor under this Agreement.
SECTION 00-7300
SUPPLEMENTARY CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

A. These Supplementary Conditions amend and supplement the General Conditions, AIA Document A201-2007 General Conditions of the Contract for Construction defined in Document 00-7200 and other provisions of the Contract Documents as indicated below. All provisions that are not so amended or supplemented remain in full force and effect.

B. The terms used in these Supplementary Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 MODIFICATIONS TO GENERAL CONDITIONS

A. ARTICLE 1. GENERAL PROVISIONS

1. 1.1.1: Revise the first sentence as set forth below:

   a. The Contract Documents consist of the Conditions of the Contract (General, Supplementary and other Conditions), Contract Forms as bound or referenced, the Drawings, the Specifications, the Details, all Addenda issued prior to execution of the contract and all modifications issued after execution of the Contract.

2. 1.2 CORRELATIONS AND INTENT OF THE CONTRACT DOCUMENTS

   a. 1.2.1 Add the following:

      1) If work is required in a manner to make it impossible to produce first class work, or should discrepancies appear among contract documents, request interpretation before proceeding with work. If Contractor fails to make such request, no excuse will thereafter be entertained for failure to carry out work in satisfactory manner.

   b. 1.2.3: Add the following:

      1) Reference to technical society, organization, or body is made in specifications in accordance with the following abbreviations:

         (a) ACI American Concrete Institute
         (b) AIA American Institute of Architects
         (c) AIEE American Institute of Electrical Engineers
         (d) AISC American Institute of Steel Construction
         (e) ASA American Standard Association
         (f) APA American Plywood Association
         (g) ASTM American Society of Testing Materials
         (h) ASME American Society of Mechanical Engineers
         (i) AWI Architectural Woodwork Institute
         (j) AWSC American Welding Society Code
         (k) CS Commercial Standard
         (l) FS Federal Specifications
         (m) MIL Military Specifications
         (n) NBFU National Board of Fire Underwriters
         (o) NBS National Board of Standards
         (p) NEC National Electric Code
         (q) NEMA National Electrical Manufacturer's Assn.
         (r) NFPA National Fire Protection Association
         (s) OSHA Occupational Safety and Health Act
         (t) UBC Uniform Building Code
         (u) IBC International Building Code
         (v) UL Underwriters Laboratory
         (w) WCLIB West Coast Lumber Inspection Bureau

B. ARTICLE 2 OWNER

1. 2.1.1 Add the following:
a. The Owner is defined as The Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians (CTCLUSI).

2. 2.2.5 Substitute the following:
   a. The Owner through the Architect will furnish to the Contractor 6 complete sets of drawings and specifications without charge for use on project. These include sets submitted to Agency having jurisdiction for plans review and building permit. Additional copies may be purchased by Contractor at cost of reproduction.

C. ARTICLE 3 CONTRACTOR
1. 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES
   a. 3.3.1 Add the following:
      1) The Contractor will supervise and direct the work and will review with all subcontractors methods and materials to be used to verify their compliance with all safety standards and laws and be responsible for compliance with same, to insure safe, hazard free conditions for all persons visiting or working on the entire project.

2. 3.7 PERMITS, FEES, NOTICES, AND COMPLIANCE WITH LAWS
   a. 3.7.1 Add:
      1) The Owner shall pay for the Building Permit. The Contractor shall pay all other permit and plan review fees related to his work and his subcontractors, including plumbing, mechanical and electrical permits. Owner shall pay any system development fees required.

3. 3.11 DOCUMENTS AND SAMPLES AT THE SITE, Add the following
   a. Upon completion of the project transfer all information from the record set of drawings to a clean set of prints and deliver to the Architect. Drawing additions are to be added in contrasting ink and are to be accurate, neat and finished in appearance and show accurate horizontal and vertical dimensions for location of underground work. Drawings must be acceptable to Architect before certification of final payment will be made.

4. 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES
   a. 3.12.5 Add the following:
      1) See Section 01-3000 - Administrative Requirements for submittal information, requirements, and procedures.

5. 3.15 CLEANING UP
   a. 3.15.1 Add the following:
      1) Upon completion of any portion of the work, promptly remove temporary facilities generated by that portion of the work, including surplus materials, equipment, and machinery if so directed by the Architect or the Owner. Upon completion of the Work, completely remove temporary facilities. Remove stains, spots and smears from all surfaces. Remove all labels. Leave the premises in a "broom clean" condition.

D. ARTICLE 4 ARCHITECT
1. 4.1.1 Add the following:
   a. The Architect is defined as HGE INC., Architects, Engineers & Planners.

E. ARTICLE 5 SUBCONTRACTORS
1. 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK
   a. 5.2.1 Add the following:
      1) The list of subcontractors shall be submitted no later than five (5) days after the bid opening.

F. ARTICLE 7 CHANGES IN THE WORK
1. 7.2 CHANGE ORDERS
   a. 7.2.2 Add the following:
      1) The cost to the Owner resulting from extra work shall be determined by an agreed price which shall include a percentage for overhead and profit as listed
below; or shall be the actual cost of the additional direct labor, materials, and subcontract work involved, plus a percentage for overhead and profit as listed below.

(a) The percentage shall not exceed 10% to cover both profit and overhead.

2) The credit to the Owner resulting from a deduction of work shall be determined by an agreed price, or the actual cost of direct labor, materials, and subcontract work involved.

3) Cost and credits shall be submitted by the Contractor to the Architect in a complete breakdown form, showing cost, overhead and profit.

4) Cost shall be limited to the following: Cost of products, including taxes and cost of delivery; cost of labor, including social security, old age, and unemployment insurance, and fringe benefits under collective bargaining agreements; Workmen’s Compensation Insurance; bond premiums; and rental value of power tools and equipment. Overhead shall include the following: Supervision, superintendence, wages of time keepers, watchmen, and clerks, hand tools, incidentals, general office expense, and all other proven expenses not included in “cost”.

G. ARTICLE 8 TIME

1. 8.2 PROGRESS AND COMPLETION

   a. 8.2.4 Add the following:

      1) The Contractor agrees:

      2) To proceed upon receipt of the executed Contract and the Notice to Proceed.

      3) It is hereby understood and mutually agreed, by and between the contractor and the Owner, that the date of beginning and the time for completion of each phase of the work to be done are ESSENTIAL CONDITIONS of this contract.

      4) The Contractor agrees that said work shall be prosecuted regularly, diligently, at such rate of progress as will insure substantial completion thereof within the time specified. It is expressly understood and agree, by and between the Contractor and the Owner that the time for the completion of the work described herein is reasonable taking into consideration the average climatic range and usual industrial conditions prevailing in this locality.

H. ARTICLE 9 PAYMENTS AND COMPLETION

1. APPLICATIONS FOR PAYMENT

   a. 9.3.1 Add the following:

      1) Payment request form shall be submitted on AIA G702 Application for Payment supplemented with AIA G703 Continuation Sheet. Forms will be furnished by Architect if requested by Contractor. Contractor may use their own spreadsheet type format, however line items must exactly match AIA line items.

2. PROGRESS PAYMENTS

   a. 9.6.1 Amend as follows:

      1) After the Architect has issued a certificate for payment the Owner will pay the Contractor ninety-five (95%) percent of the value of material and labor worked into the building or stored on the site before the first day of the month less the aggregate of previous payments.

      2) Payment will be made on or before the twentieth (20th) day of the month following the date of the application for payment.

      3) Upon Substantial Completion of the contract the sum sufficient to increase total payment to ninety-five (95%) percent of the contract amount is due. Thirty (30) days thereafter, provided the work then be fully completed and accepted by Architects, balance under the contract is due.

I. ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

1. 10.2 SAFETY OF PERSONS AND PROPERTY

   a. 10.2.2 Add the following:
1) Contractors shall comply with all provisions of OAR 437 Division 155 (Hazard Communication). Contractor shall provide Owner, through the Architect, a copy of MSDS (Material Safety Data Sheets) for all chemicals brought onto the site, and shall maintain an inventory on the job site of such chemicals. Such inventory shall be accessible to those who desire access.

J. ARTICLE 11 INSURANCE AND BONDS
1. 11.1 CONTRACTORS LIABILITY INSURANCE
   a. 11.1.2 Add the following:

   1) The Contractor’s comprehensive general liability insurance and automobile liability insurance shall not be less than the amount shown below:
   2) Worker's Compensation as required by law:
   3) Bodily Injury Liability - Automobile:
      (a) Each person $500,000
      (b) Each occurrence $1,000,000
   4) Bodily Injury Liability - Except Automobile
      (a) Each person $1,000,000
      (b) Each occurrence $1,000,000
   5) Property Damage Liability - Automobile:
      (a) Each occurrence $500,000
   6) Property Damage Liability - Except Automobile:
      (a) Each occurrence $500,000
      (b) Aggregate occurrence $1,000,000
   7) The Contractor will either (1) require each of his subcontractors to procure and maintain during the life of his subcontract, subcontractor’s comprehensive general liability, automobile liability, and property damage liability insurance of the type and in the same amounts as specified in this subparagraph; or (2) insure the activity of his subcontractors.
   8) The Contractor, its subcontractors, if any, and all employers working under this Agreement are subject employers under the Oregon Worker’s Compensation Law and shall comply with ORS 656.017, which requires them to provide workers’ compensation coverage for all their subject workers.

2. 11.4 PERFORMANCE AND PAYMENT BOND
3. 11.4.1 Substitute the following:
   a. The Contractor shall furnish a Performance Bond in an amount equal to one hundred (100%) percent of the contract sum as security for the faithful performance of this contract and also a Labor and Material Payment Bond in an amount not less than one hundred (100%) percent of the contract sum as security for the payment of all persons performing labor on the project under this contract. Bond shall be written by a company licensed in the State of Oregon and satisfactory to the Owner.

K. ARTICLE 12 MISCELLANOUS PROVISIONS
1. 13.1 GOVERNING LAW, Add the following:
   a. General Contractor and each subcontractor to comply with all Federal, State laws pertaining to Social Security, Unemployment Insurance, Tax Regulations. Make prompt payment to designated agencies.
   b. Contractor agrees to abide by all Federal, State, and Tribal regulations pertaining to the employment of minority and ethnic groups including all required affirmative action, and further agrees to hold owner harmless on account of all duties and responsibilities imposed on Contractor by the terms of any Tribal, State or Federal Statute, regulation, or other governmental directive.

L. ARTICLE 13 SUPPLEMENTAL PUBLIC CONTRACTING STATUTES
1. All employers, including Contractor, that employ subject workers who work under this contract shall comply with ORS 656.017 and provide the required Workers’ Compensation coverage, unless such employers are exempt under ORS 656.126. Contractor shall ensure that each of its subcontractors complies with these requirements.
2. All sums due the State Unemployment Compensation Fund from the Contractor or any Subcontractor in connection with the performance of the contract shall be promptly so paid.

3. Contractor certifies that it has not discriminated against minorities, women or emerging small business enterprises in obtaining any required subcontractors.

4. Contractor certifies its compliance with the Oregon tax laws, in accordance with ORS 305.385.

5. In the performance of this contract, the Contractor shall use, to the maximum extent economically feasible, recycled paper, materials, and supplies.

6. Contractor certifies that all subcontractors performing construction work under this contract will be licensed with the Construction Contractors Board or licensed by the state Landscaper Contractors Board in accordance with 701.035 to 701.055 before the subcontractors commence work under this contract.

7. In compliance with the provisions of ORS 279C.525, the following is a list of federal, state and local agencies, of which the Owner has knowledge, that have enacted ordinances or regulations dealing with the prevention of environmental pollution and the preservation of natural resources that may affect the performance of the contract:
   a. FEDERAL AGENCIES
      1) Agriculture, Department of
      2) Forest Service
      3) Soil Conservation Service
      4) Defense, Department of
      5) Army Corps of Engineers
      6) Environmental Protection Agency
      7) Interior, Department of
      8) Bureau of Sport Fisheries and Wildlife
      9) Bureau of Outdoor Recreation
     10) Bureau of Land Management
     11) Bureau of Indian Affairs
     12) Bureau of Reclamation
     13) Labor, Department of
     14) Occupational Safety and Health Administration
     15) Transportation, Department of
     16) Coast Guard
     17) Federal Highway Administration
   b. STATE AGENCIES:
      1) Agriculture, Department of
      2) Environmental quality, Department of
      3) Fish and Wildlife, Department of
      4) Forestry, Department of
      5) Geology and Mineral Industries, Department of
      6) Human Resources, Department of
      7) Land Conservation and Development Commission
      8) Soil and Water Conservation Commission
      9) State Engineer
     10) State Land Board
     11) Water Resources Board
   c. LOCAL AGENCIES:
      1) City Council
      2) County Court
      3) County Commissioners, Board of
      4) Port Districts
      5) Metropolitan Service Districts
      6) County Service Districts
M. ARTICLE 14 CTCLUSI CONTRACTUAL PROVISIONS:

1. CTCLUSI will require all contracts resulting from these Construction Documents to include, but not be limited to, the following provisions:
   
a. Venue: The venue for any suit or action, including a resolution of any dispute as to the enforceability, validity, or scope of this agreement, is exclusively in the Tribal Court of the Tribes of Coos, Lower Umpqua and Siuslaw Indians. All parties consent and submit to such jurisdiction and waive any right to seek any other jurisdiction.
   
b. Sovereign Immunity: Nothing in this agreement is intended to be construed as a waiver of sovereign immunity or the acknowledgment.
   
c. (3) Indian Preference: The parties to this contract shall comply with the provisions of Section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).
   
d. In connection with this contract, the contractor shall, to the greatest extent feasible, give preference in the award of any subcontract to any Indian organizations and Indian-owned economic enterprises, and preferences and opportunities for training and employment to Indians.
   
e. The contractor shall include this Section 7(b) clause in every subcontract in connection with the project, and shall, at the direction of CTCLUSI, take appropriate action pursuant to the subcontract upon a finding by CTCLUSI or HUD that the subcontractor has violated the Section 7(b) clause of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450(b)).
   
f. (4) CLUSITC Building Code: The Contractor shall include in every subcontract in connection with this project that the subcontractor agrees to comply with the CLUSITC Building Code and any and all requirements determined by the CTCLUSI Building Inspector.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01-1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT
A. Project Name: 17.10 Conf. Tribes of Coos, Lower Umpqua & Siuslaw Indians - Dental Clinic Renovation
B. Owner Name: Confederated Tribes of Coos, Lower Umpqua & Siuslaw Indians (CTCLUSI)
C. Architect's Name: HGE, INC., ARCHITECTS, ENGINEERS & PLANNERS
D. The Work includes but is not limited to a single-story building addition of approximately 1400 sf to provide additional dental exam/operatories and related support spaces, and expanded waiting area. New dental equipment, dental cabinetry and relocation of existing dental equipment to be by Owner. Contractor to coordinate installation by Owner. Work also includes remodel of approximately 1900 sf of the existing dental clinic area. The work is to be staged by the contractor to allow the clinic to remain operational during the entire construction period. The project is located at the north end of the existing Tribal Administration Building at 1245 Fulton Avenue, Coos Bay, Oregon.

1.02 CONTRACT DESCRIPTION
A. Contract Type: A single prime contract based on a Stipulated Price as described in Contract Documents.

1.03 WORK BY OWNER
A. Owner has awarded a contract for supply and installation of dental equipment as noted on the Drawings which will commence on a date to be determined. Rough-in of all equipment by Contractor.
B. Items noted NIC (Not in Contract) will be supplied and installed by Owner before Substantial Completion. Some items include:
   1. Movable cabinets.
   2. Furnishings.
   3. Small equipment.
   4. Dental equipment and cabinetry as noted.
   5. Existing dental equipment and cabinetry as noted.
C. Owner will supply and install the following:
   1. Toilet Accessories as noted.
D. Owner will supply the following for installation by Contractor:
   1. Specialty rough-in boxes as provided by dental equipment vendor.

1.04 OWNER OCCUPANCY
A. Owner intends to continue to occupy portions of the existing building during the entire construction period.
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. Construction Operations: Limited to areas noted on Drawings.
B. Arrange use of site and premises to allow:
   1. Owner occupancy.
   2. Use of site and premises by the public.
C. 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.

D. Existing building spaces may not be used for storage.

E. Time Restrictions:
   1. Limit conduct of especially noisy exterior work to the hours of 8 to 5.
   2. Limit conduct of the hours of 8 to 5.
   3. The hours mentioned above are subject to change at any time when given 24-hour notification by owner.

F. Utility Outages and Shutdown:
   1. Limit disruption of utility services to hours the building is unoccupied. Notify owner of disruptions 24 hours in advance.
   2. Prevent accidental disruption of utility services to other facilities.

1.06 WORK SEQUENCE

A. Construct Work in phases during the construction period:
   1. Phase 1: The majority of the Work including building addition and a portion of remodel work, excluding existing dental clinic areas. The existing building will remain operational during regular hours for the duration of the project. The existing dental clinic area will remain operational for the duration of the project. A temporary access route will be developed by the Owner to avoid patient access thru the construction zone.
   2. Phase 2: Remaining Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01-3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Submittals for review, information, and project closeout.
B. Number of copies of submittals.
C. Submittal procedures.

1.02 RELATED REQUIREMENTS
A. Section 01-7000 - Execution and Closeout Requirements: Additional coordination requirements.
B. Section 01-7800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 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 compliance 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 and for record documents purposes described in Section 01-7800 - Closeout Submittals.

3.02 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.

3.03 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 compliance with requirements of Section 01-7800 - 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.
3.04 SUBMITTAL PROCEDURES

A. General Requirements:
B. Transmit each submittal with approved form.
C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
E. 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.
F. Deliver submittals to Architect at business adress and electronically, via e-mail.
G. Schedule submittals to expedite the Project, and coordinate submission of related items.
H. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
J. Provide space for Contractor and Architect review stamps.
K. When revised for resubmission, identify all changes made since previous submission.
L. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
M. Submittals not requested will not be recognized or processed.

END OF SECTION
SECTION 01-4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.
B. Testing and inspection agencies and services.
C. Control of installation.
D. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00-7200 - General Conditions: Inspections and approvals required by public authorities.
B. Section 01-3000 - Administrative Requirements: Submittal procedures.
C. Section 01-6000 - Product Requirements: Requirements for material and product quality.

1.03 SUBMITTALS

A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing compliance with information given and the design concept expressed in the contract documents, or for Owner's information.
C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to 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. Compliance with Contract Documents.
      k. When requested by Architect, provide interpretation of results.

1.04 TESTING AND INSPECTION AGENCIES AND SERVICES

A. Contractor shall employ and pay for services of an independent testing agency to perform other specified testing.
B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
C. Contractor Employed Agency:

PART 3 EXECUTION

2.01 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.

2.02 TESTING AND INSPECTION

A. 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-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. 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.

C. 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.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

2.03 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

END OF SECTION
SECTION 01-5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Temporary sanitary facilities.
B. Temporary Controls: Barriers, enclosures, and fencing.
C. Security requirements.
D. Waste removal facilities and services.

1.02 RELATED REQUIREMENTS
A. Section 01-5100 - Temporary Utilities.

1.03 TEMPORARY UTILITIES - SEE SECTION 01-5100

1.04 TEMPORARY SANITARY FACILITIES
A. Provide and maintain temporary sanitary facilities at Qaxas site and at Florence site for the duration of work performed at each location. Use of existing facilities is not permitted. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.

1.05 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, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.06 FENCING
A. Provide 6 foot high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.07 INTERIOR ENCLOSURES
A. Provide temporary partitions and ceilings as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.
B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces.

1.08 SECURITY - SEE SECTION 01-3553
A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.09 WASTE REMOVAL
A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
B. Provide containers with lids. Remove trash from site periodically.
C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.
PART 2 PRODUCTS - NOT USED
PART 3 EXECUTION - NOT USED

END OF SECTION
SECTION 01-5100
TEMPORARY UTILITIES

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Temporary Utilities: Provision of electricity, lighting, heat, ventilation, and water.

1.02 RELATED REQUIREMENTS
A. Section 01-5000 - Temporary Facilities and Controls:
   1. Temporary sanitary facilities required by law.

1.03 TEMPORARY ELECTRICITY
A. Connect to Owner's existing power service.
   1. Contractor may utilize available electrical power at each unit to perform work.
   2. Do not disrupt Owner's need for continuous service.
   3. Exercise measures to conserve energy.
B. Complement existing power service capacity and characteristics as required.

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

END OF SECTION
SECTION 01-6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 01-2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

B. Section 01-6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

C. Section 01-7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.02 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 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Use of products having any of the following characteristics is not permitted:

C. Where other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01-6116.
   2. If wet-applied, have lower VOC content, as defined in Section 01-6116.

2.02 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.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01-2500 - Substitution Procedures.

B. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

D. A request for substitution 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.
   2. Will provide the same warranty for the substitution as for the specified product.
3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
4. Waives claims for additional costs or time extension that may subsequently become apparent.

E. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.
   2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
   3. The Architect will notify Contractor of decision to accept or reject request by addendum.

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. See Section 01-7419.
   B. Store and protect products in accordance with manufacturers' instructions.
   C. Store with seals and labels intact and legible.
   D. Store sensitive products in weathertight, 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.

END OF SECTION
SECTION 01-6116
VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."
B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02  RELATED REQUIREMENTS

A. Section 01-3000 - Administrative Requirements: Submittal procedures.

1.03  DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
B. Interior of Building: Anywhere inside the exterior weather barrier.

1.04  SUBMITTALS

A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Evidence of Compliance: Submit for each different product in each applicable category.
C. Product Data: For each VOC-restricted product used in the project, submit evidence of compliance.

PART 2  PRODUCTS

2.01  MATERIALS

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

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
SECTION 01-7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Examination, preparation, and general installation procedures.
B. Cutting and patching.
C. Surveying for laying out the work.
D. Cleaning and protection.
E. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
F. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS
A. Section 01-1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
B. Section 01-3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
C. Section 01-4000 - Quality Requirements: Testing and inspection procedures.
D. Section 01-5000 - Temporary Facilities and Controls: Temporary interior partitions.
E. Section 01-7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties, and bonds.
F. Section 02-4100 - Demolition: Demolition of whole structures and parts thereof; site utility demolition.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01-3000 - 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 compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.
C. 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.
D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS
A. For surveying work, employ a land surveyor registered in the State in which the Project is located 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,

1.06 PROJECT CONDITIONS
A. Use of explosives is not permitted.
B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. 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 spaces.
   1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.

F. 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 8 am to 5 pm.

G. 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. See Section 01-1000 for occupancy-related requirements.

B. 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.

C. Notify affected utility companies and comply with their requirements.

D. 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.

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 01-6000 - 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 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Contractor shall locate and protect survey control and reference points.

D. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

E. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

F. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

G. Utilize recognized engineering survey practices.

H. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

I. 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.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations.

J. Periodically verify layouts by same means.

K. Maintain a complete and accurate log of control and survey work as it progresses.

3.04 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.

3.05 CUTTING AND PATCHING

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

B. 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-complying work.

C. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing.
D. Employ skilled and experienced installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.
E. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.
F. Restore work with new products in accordance with requirements of Contract Documents.
G. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
H. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
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.

3.06 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 periodically and dispose off-site; do not burn or bury.

3.07 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.

3.08 ADJUSTING
A. Adjust operating products and equipment to ensure smooth and unhindered operation.
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3.09 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,
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, scuppers, 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.

3.10 CLOSEOUT PROCEDURES
A. Make submittals that are required by governing or other authorities.
B. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
C. 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.
D. 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.
E. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
F. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
G. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.11 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
SECTION 01-7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Project Record Documents.
   B. Operation and Maintenance Data.
   C. Warranties and bonds.
   D. Evidence of Payments and Release of Liens.

1.02 RELATED REQUIREMENTS
   A. Section 00-7200 - General Conditions: Performance bond and labor and material payment bonds, warranty, and correction of work.
   B. Section 01-3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.
   C. Section 01-7000 - Execution and Closeout Requirements: Contract closeout procedures.
   D. Individual Product Sections and Drawings: Specific requirements for operation and maintenance data.
   E. Individual Product Sections and Drawings: 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. Drawings.
      2. Specifications.
      3. Addenda.
      4. Change Orders and other modifications to the Contract.
      5. Reviewed shop drawings, product data, and samples.
      6. Manufacturer's instruction for assembly, installation, and adjusting.
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. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.
F. Record Drawings and Shop 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:
   1. Product data, with catalog number, size, composition, and color and texture designations.
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.
D. Additional information as specified in individual product specification sections.
E. 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 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. Prepare instructions and data by personnel experienced in maintenance and operation of described products.
D. Binders: Commercial quality, 8-1/2 by 11 inch three D side ring binders with durable plastic covers; 2 inch maximum ring size. When multiple binders are used, correlate data into related consistent groupings.
E. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
F. Project Directory: Title and address of Project; names, addresses, and telephone numbers of
Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

G. 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.

H. 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.

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

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

3.05 WARRANTIES AND BONDS

A. 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.

1. General Warranties:
   a. Provide one-year warranty as described in the General Conditions, Article 3.5.
      Warranty period shall commence on the date of the fully executed Certificate of
      Substantial Completion.
   b. Weather-tight warranty: The Contractor shall, and hereby does, warranty flashings,
      roofing, and all other work which is a component part of the roofing to be weather-tight
      under ordinary wear and usage for a period of two years from and after Substantial
      Completion of the building. This is an extension of the general one year warranty
      described above.

2. Additional Warranties: See individual technical specifications or drawings for required
   written warranties for specific items of work.

3. Warranty Period shall begin upon Substantial Completion, or if a Certificate of Substantial
   Completion is not issued or if Work which is to be covered by warranty is not then
   complete, Warranty Period shall begin upon the date of Final Acceptance or on the date
   appearing on the final Certificate for Payment to the Contractor, whichever is earlier.

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

C. Co-execute submittals when required.

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

E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable
   plastic covers.

F. 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.

G. 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.

H. 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.

3.06 EVIDENCE OF PAYMENTS AND RELEASE OF LIENS

A. Submit with Final Application for Payment the following:
   2. Contractor's Affidavit of Release of Liens: AIA G706A, with
      a. Consent of Surety to Final Payment: AIA G707.
b. Contractor's release or waiver of liens.
c. Separate releases or waivers of liens for subcontractors, suppliers, and others with
   lien rights against property of Owner.

END OF SECTION
SECTION 02-4100
DEMOLITION

PART 3 EXECUTION

1.01 GENERAL PROCEDURES AND PROJECT CONDITIONS
A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. 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.
   3. Provide, erect, and maintain temporary barriers and security devices.
   4. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   5. Do not close or obstruct roadways or sidewalks without permit.
   6. 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.
   7. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
B. Do not begin removal until receipt of notification to proceed from Owner.
C. 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.

1.02 DEBRIS AND WASTE REMOVAL
A. Remove debris, junk, and trash from site.
B. Leave site in clean condition, ready for subsequent work.
C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION
SECTION 03-2000
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Reinforcing steel for cast-in-place concrete.
   B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS
   A. Section 31-6216.13 - Steel Pipe Piles: Reinforcement for foundation footings and grade beams.
   B. Section 03-3000 - Cast-in-Place Concrete.
   C. Testing Agency Requirements.

1.03 REFERENCE STANDARDS
   A. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
   B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2011.
   F. CRSI (DA4) - Manual of Standard Practice; 2009.

1.04 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
   C. Manufacturer’s Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

1.05 QUALITY ASSURANCE
   A. Perform work of this section in accordance with ACI 301.

PART 2 PRODUCTS

2.01 REINFORCEMENT
   A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
      1. Deformed billet-steel bars.
      2. Unfinished.
   B. Reinforcement Accessories:
      1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
      2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.02 FABRICATION
   A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.
   B. Welding of reinforcement is not permitted.
   C. Locate reinforcing splices not indicated on drawings at point of minimum stress.

PART 3 EXECUTION

3.01 PLACEMENT
   A. Place, support and secure reinforcement against displacement. Do not deviate from required position.
B. Do not displace or damage vapor barrier.
C. Accommodate placement of formed openings.
D. Maintain concrete cover around reinforcing as follows:
   1. Supported Slabs and Joists: 3/4 inch, not exposed to ground or weather.
   2. Walls (exposed to weather or backfill): 2 inch.
   3. Footings and Concrete Formed Against Earth: 3 inch.
   4. Slabs on Fill: 3 inch.
E. Comply with applicable code for concrete cover over reinforcement.

END OF SECTION
SECTION 03-3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Floors and slabs on grade.
B. Concrete foundation walls and exposed exterior walls with formliner texture, exposed smooth interior walls.
C. Joint devices associated with concrete work.
D. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.

1.02 RELATED REQUIREMENTS

A. Section 014000 - Quality Requirements.
B. Section 03-1000 - Concrete Forming and Accessories: Forms and accessories for formwork.
C. Section 03-2000 - Concrete Reinforcing.
D. Section 03-3511 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.

1.03 REFERENCE STANDARDS

C. ACI 301 - Specifications for Structural Concrete; 2010 (Errata 2012).
D. ACI 302.1R - Guide for Concrete Floor and Slab Construction; 2004 (Errata 2007).
F. ACI 306R - Cold Weather Concreting; 2010.
G. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014.
H. ACI 347R - Guide to Formwork for Concrete; 2014.
S. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.


1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
D. Test Reports: Submit report for each test or series of tests specified.
E. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.
F. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
G. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.05 QUALITY ASSURANCE
A. Perform work of this section in accordance with ACI 301 and ACI 318.
B. Follow recommendations of ACI 306R when concreting during cold weather.

1.06 WARRANTY
A. See Section 01-7800 - Closeout Submittals, for additional warranty requirements.
B. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover the cost of flooring failures due to moisture migration from slabs for ten years.
   1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.

PART 2 PRODUCTS

2.01 FORMWORK
A. Comply with requirements of Section 03-1000.
B. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.

2.02 REINFORCEMENT MATERIALS
A. Comply with requirements of Section 03-2000.

2.03 CONCRETE MATERIALS
A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.
B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.
C. Fly Ash: ASTM C618, Class C or F.
D. Calcined Pozzolan: ASTM C618, Class N.
E. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
F. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES
A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
B. Air Entrainment Admixture: ASTM C260/C260M.

2.05 ACCESSORY MATERIALS
A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Installation: Comply with ASTM E1643.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   3. Manufacturers:
      b. Substitutions: See Section 01-6000 - Product Requirements.
B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Grout: Comply with ASTM C1107/C1107M.
C. Epoxy Adhesive: Moisture-insensitive, two-part; consisting of epoxy resin, non-metallic aggregate, and activator.
   1. Manufacturers:
      b. Simpson SET-XP or 3.
      c. Or equivalent.

2.06 BONDING AND JOINTING PRODUCTS
A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
   1. Manufacturers:
      c. Substitutions: See Section 01-6000 - Product Requirements.
B. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.

2.07 CURING MATERIALS
A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
   1. Manufacturers:
      a. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
      c. Substitutions: See Section 01-6000 - Product Requirements.
B. Moisture-Retaining Sheet: ASTM C171.
   1. Curing paper, regular.

2.08 CONCRETE MIX DESIGN
A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

C. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: 4,000 psi, unless drawings indicate otherwise. Concrete should be a minimum of a 6-sack mix.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Water-Cement Ratio: Maximum 40 percent by weight.
   6. Total Air Content: 4-1/2 percent, determined in accordance with ASTM C173/C173M, 5% for concrete exposed to soil/weather.

2.09 MIXING
   A. Transit Mixers: Comply with ASTM C94/C94M.
   B. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION
   A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
   B. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in accordance with bonding agent manufacturer's instructions.
      1. Use latex bonding agent only for non-load-bearing applications.

3.03 REBAR DOWELING WITH EPOXY ADHESIVE
   A. Install in accordance with manufacturers evaluation report.
      1. Coordinate inspection.
      2. Clean hole.
      3. Insure adequate mixing.
      4. Allow cure time.

3.04 PLACING CONCRETE
   A. Place concrete in accordance with ACI 304R.
   B. Place concrete for floor slabs in accordance with ACI 302.1R.
   C. Notify Architect and Owner's Independant Testing Agency not less than 24 hours prior to commencement of placement operations.
   D. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
   E. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.
   F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.
3.05  SLAB JOINTING
A. Locate joints as indicated on drawings.
B. Anchor joint fillers and devices to prevent movement during concrete placement.
C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.

3.06  FLOOR FLATNESS AND LEVELNESS TOLERANCES
A. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
B. Correct the slab surface if tolerances are less than specified.
C. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07  CONCRETE FINISHING
A. Repair surface defects, including tie holes, immediately after removing formwork.
B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/8 inch or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
D. Vertical Cast-In-Place Concrete:
   1. Avoid patching.
   2. Fill tie holes with approved and appropriate tie-hole patching compounds only, expansive or non-shrink, matching color of concrete. Compound to be shrinkage compensating to remain tightly in the tie hole.
E. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   2. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.
   3. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
   4. Sidewalk Paving, ramps: Light broom, texture perpendicular to direction of travel with troweled and radius edge 1/4 inch radius.

3.08  CURING AND PROTECTION
A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
D. Surfaces Not in Contact with Forms:
   1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   2. Final Curing: Begin after initial curing but before surface is dry.
a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.

3.09 FIELD QUALITY CONTROL
A. An independent testing agency will perform field quality control tests, as specified in Section 01-4000 - Quality Requirements.
B. Provide free access to concrete operations at project site and cooperate with appointed firm.
C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.
E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

3.10 DEFECTIVE CONCRETE
A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.
C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION
A. Do not permit traffic over unprotected concrete floor surface until fully cured.
B. Protect slabs scheduled for exposed finish, polished or trowel finish, from damage, staining, or discoloration during entire course of construction.

END OF SECTION
SECTION 06-1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.
B. Exposed timber structural framing.
C. Non-structural dimension lumber framing.
D. Rough opening framing for doors, windows, and roof openings.
E. Sheathing.
F. Subflooring.
G. Underlayment.
H. Preservative treated wood materials.
I. Miscellaneous framing and sheathing.
J. Communications and electrical room mounting boards.
K. Concealed wood blocking, nailers, and supports.
L. Miscellaneous wood nailers, furring, and grounds.
M. Roof sheathing with factory applied roofing underlayment.

1.02 RELATED REQUIREMENTS

A. Section 06-1736 - Metal-Web Wood Joists.
B. Section 06-1753 - Shop-Fabricated Wood Trusses.
C. Section 06-1800 - Glued-Laminated Construction.
D. Section 07-2500 - Weather Barriers: Water-resistive barrier over sheathing.
E. Section 07-6200 - Sheet Metal Flashing and Trim: Sill flashings.

1.03 REFERENCE STANDARDS

D. PS 1 - Structural Plywood; 2009.
E. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.
G. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2004, and supplements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir-Larch, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.
2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS
A. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).
B. Sizes: Nominal sizes as indicated on drawings, S4S.
C. Moisture Content: S-dry or MC19.
D. Stud Framing (2 by 2 through 2 by 6):
   2. Grade: No. 2.
E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
   2. Grade: No. 2 & Btr.
F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER
A. Sizes: Nominal sizes as indicated on drawings.
B. Surfacing: S4S.
C. Sizes: Nominal sizes as indicated on drawings, Rough (unsurfaced).
D. Moisture Content: S-dry or MC19.
E. Rafter, Small Beam, and Purlin Framing (2 by 6 through 4 by 16):
   1. Species: Western Cedar.
   2. Grade: Select.
F. Location: North side covered walkway, heavy timber framing and brackets. West side awning framing, brackets.

2.04 TIMBERS
A. Sizes: Nominal sizes as indicated on drawings, S4S.
B. Moisture Content: S-dry (23 percent maximum).
C. Beams and Posts 5 inches and over in thickness:
   1. Grade: No. 2.

2.05 CONSTRUCTION PANELS
A. Subflooring: Particleboard, ANSI A208.1, Grade M-2 EXTERIOR GLUE waferboard; 3/4 inch thick, tongue and groove edge.
B. Underlayment: APA Underlayment; plywood, Exposure 2, 3/8 inch thick. Fully sanded faces at resilient flooring.
C. Roof Sheathing: APA PRP-108/APA PRPR-108, Form B455, Structural I Rated Sheathing, Exterior Exposure Class, and as follows:
   2. Thickness: 5/8 inch, nominal.
   3. Edges: square.
D. Roof Sheathing: Oriented strand board structural wood panel, PS 2, with factory laminated roofing underlayment layer.
   1. Sheathing Panel:
      a. Size: 4 feet wide by 8 feet long.
      b. Edge Profile: Self-spacing profile.
   2. Integral Roofing Underlayment Layer: Medium density, phenolic impregnated kraft paper overlay.
   3. Exposure Time: Sheathing undamaged and integral roofing underlayment layer intact after exposure to weather for up to 180 days.
4. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center.

5. Seam Tape: Manufacturer's standard pressure-sensitive, self-adhering, cold-applied seam tape consisting of polyolefin film with acrylic adhesive.

E. Wall Sheathing: APA PRP-108/APA PRP-108, Form B455 Structural I Rated Sheathing, Exterior Exposure Class, and as follows:
   2. Thickness: 1/2 inch, nominal.

F. Wall Sheathing, Oriented Strand Board (OSB): APA rated structural sheathing, structural I.

G. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.06 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Preservative Treatment:
   1. Manufacturers:
      d. Substitutions: See Section 01-6000 - Product Requirements.
   2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative to 0.40 lb/cu ft retention.
      a. Treat lumber exposed to weather.
      b. Treat lumber in contact with roofing, flashing, or waterproofing.
      c. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top
story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.
   3. Handrails.
   4. Grab bars.
   5. Towel and bath accessories.
   6. Wall-mounted door stops.

3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Subflooring: Glue and nail to framing; staples are not permitted.

B. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
   1. At long edges provide solid edge blocking where joints occur between roof framing members, as indicated on Roof Framing Plan
   2. Nail panels to framing; staples are not permitted.

C. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.

D. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

3.05 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.06 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.07 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01-7419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.

END OF SECTION
SECTION 06-1733
WOOD I-JOISTS

PART 1  GENERAL

1.01  SECTION INCLUDES
   A. Wood I-joists for roof and floor framing.
   B. Bridging, bracing, and anchorage.

1.02  RELATED REQUIREMENTS
   A. Section 06-1000 - Rough Carpentry: Installation requirements for miscellaneous framing.

1.03  DESIGN REQUIREMENTS
   A. Refer to structural notes/criteria in Drawings.

1.04  SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Manufacturer's literature describing materials, dimensions, allowable spans and spacings, bearing and anchor details, bridging and bracing requirements, and installation instructions; identify independent inspection agency.
   C. Shop Drawings: Indicate sizes and spacing of joists, bracing and bridging, bearing stiffeners, holes to be cut (if any), and framed openings between joists.
   D. Certificate: Certification by joist manufacturer that products delivered are of the same design and construction as those evaluated by the independent inspection agency.

1.05  DELIVERY, STORAGE, AND HANDLING
   A. Deliver products to site in manufacturer's original packaging with manufacturer's name and product identification intact and legible.
   B. Protect products from damage due to weather and breakage.
   C. Protect joists from warping or other distortion by stacking in upright position, braced to resist movement, with air circulation under coverings and around stacks.
   D. Handle individual joists in the upright position.

PART 2  PRODUCTS

2.01  MANUFACTURERS
   A. Wood I-Joists:
      2. Louisiana-Pacific Corporation; ____: www.lpcorp.com/#sle.
      4. Substitutions: See Section 01-6000 - Product Requirements.

2.02  MATERIALS
   A. Wood I-Joists: Solid lumber top and bottom flanges and oriented strand board (OSB) webs bonded together with structural adhesive; Joints shall meet or exceed section properties of specified products as indicated on Drawings.
   B. Joist Bridging: Type, size and spacing recommended by joist manufacturer.
   C. Fasteners: Electrogalvanized steel, type to suit application.

PART 3  EXECUTION

3.01  EXAMINATION
   A. Verify that supports and openings are ready to receive joists.

3.02  PREPARATION
   A. Coordinate placement of bearing items.
3.03 ERECTION
A. Install joists in accordance with manufacturer's instructions.
B. Set structural members level and plumb, in correct position.
C. Make provisions for erection loads and for sufficient temporary bracing to maintain structure plumb and in true alignment until completion of erection and installation of permanent bracing.
D. Install permanent bridging and bracing.

3.04 TOLERANCES
A. Framing Members: 1/2 inch maximum, from true position.

END OF SECTION
SECTION 06-1800
GLUED-LAMINATED CONSTRUCTION

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Glue laminated wood beams and purlins.
B. Steel hardware and attachment brackets.

1.02 REFERENCE STANDARDS
F. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2014.

1.03 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate framing system, sizes and spacing of members, loads and cambers, bearing and anchor details, bridging and bracing, framed openings .

1.04 QUALITY ASSURANCE
A. Manufacturer/Fabricator Qualifications: Company specializing in manufacture of glue laminated structural units with three years of documented experience, and certified by AITC in accordance with AITC A190.1.

1.05 DELIVERY, STORAGE, AND HANDLING
A. Protect members to AITC requirements for individually wrapped.
B. Leave individual wrapping in place until finishing occurs.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Glued-Laminated Structural Units:
1. Western Wood Structures, Inc; ______: www.westernwoodstructures.com/#sle.
2. Substitutions: See Section 01-6000 - Product Requirements.

2.02 GLUED-LAMINATED UNITS
A. Glued-Laminated Units: Fabricate in accordance with AITC 117 Industrial grade.
1. Verify dimensions and site conditions prior to fabrication.
2. Cut and fit members accurately to length to achieve tight joint fit.
3. Fabricate member with camber built in.
4. Do not splice or join members in locations other than those indicated without permission.
5. After end trimming, seal with penetrating sealer in accordance with AITC requirements.
2.03 MATERIALS
   A. Lumber: Softwood lumber conforming to RIS grading rules with 12 percent maximum moisture content before fabrication. Design for the following values, unless indicated otherwise in Drawings:
      1. Bending (Fb): 2400 psi.
      2. Tension Parallel to Grain (Ft): 1500 psi.
      3. Compression Parallel to Grain (Fc): 1650 psi.
      4. Compression Perpendicular to Grain Bottom (Fc1): 650 psi.
      5. Compression Perpendicular to Grain Top (Fc1): 650 psi.
      6. Horizontal Shear (Fv): 165 psi.
      7. Modulus of Elasticity (E): 1,600,000 psi.
   B. Steel Connections and Brackets: ASTM A36/A36M weldable quality, galvanize per ASTM A123/A123M.
   C. Hardware: 4 (1) Type 1 high strength heavy hex bolts and 3 (2) nuts, hot-dip galvanized to meet requirements of ASTM A153/A153M, matching washers.

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

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that supports are ready to receive units.
   B. Verify sufficient end bearing area.

3.02 ERECTION
   A. Lift members using protective straps to prevent visible damage.
   B. Set structural members level and plumb, in correct positions or sloped where indicated.

3.03 TOLERANCES
   A. Framing Members: 1/2 inch maximum from true position.

END OF SECTION
SECTION 06-2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Finish carpentry items.
B. Wood door frames, glazed frames.
C. Wood casings and moldings.

1.02 RELATED REQUIREMENTS
A. Section 01-6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 06-1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.
C. Section 06-4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.
D. Section 07466 - Fiber Cement Siding.
E. Section 09-9113 - Exterior Painting: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS
B. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.
C. PS 1 - Structural Plywood; 2009.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

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

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS
A. Unless otherwise indicated provide products of quality specified by AWI Architectural Woodwork Quality Standards Illustrated for Premium grade.
B. Unless otherwise indicated provide products of quality specified by Woodwork Institute Manual of Millwork for Premium grade.

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

2.03 LUMBER MATERIALS
A. Softwood Lumber: Doug-Fir KD S4s, clear vertical grade species, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.
   2. Location: Interior trim.
B. Softwood Lumber: Resawn texture cedar, K.D., grade C and better species, maximum moisture content of 6 percent, primed, fingerjointed, 20 foot lengths.
   1. Location: Exterior trim scheduled for paint finish.

2.04 SHEET MATERIALS
A. Softwood Plywood Exposed to View: Face species as indicated, rough sawn texture, veneer core; PS 1 Grade A-B; no plugs, glue type as recommended for application.
2.05 PLASTIC LAMINATE MATERIALS
   A. Plastic Laminate: NEMA LD 3, HGS; color as selected by Architect; textured, low gloss finish.

2.06 ADHESIVE
   A. Adhesive: Type recommended by laminate manufacturer to suit application.

2.07 ACCESSORIES
   A. Aluminum Edge Trim: Extruded convex shape; smooth surface finish; self locking serrated tongue; of width to match component thickness; natural mill finish.
   B. Wood Filler: Solvent base, tinted to match surface finish color.

2.08 FABRICATION
   A. Shop assemble work for delivery to site, permitting passage through building openings.
   B. Cap exposed plastic laminate finish edges with aluminum trim.
   C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.
   D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Set and secure materials and components in place, plumb and level.
   B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

3.02 PREPARATION FOR SITE FINISHING
   A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.
   B. Site Finishing: See Section 09-9000.

3.03 TOLERANCES
   A. Maximum Variation from True Position: 1/16 inch.
   B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION
SECTION 06-4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

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

1.02 RELATED REQUIREMENTS
A. Section 06-1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

1.03 REFERENCE STANDARDS
A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
C. BHMA A156.9 - American National Standard for Cabinet Hardware; 2010.
D. ANSI A135.4 - American National Standard for Basic Hardboard; 2012.
F. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.
H. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
J. PS 1 - Structural Plywood; 2009.
K. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2010.

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.
C. Product Data: Provide data for hardware accessories.

1.05 QUALITY ASSURANCE
A. Perform work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.

PART 2 PRODUCTS

2.01 CABINETS
A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

2.02 LUMBER MATERIALS
A. Softwood Lumber: NIST PS 20; Graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Grade II/Custom; average moisture content of 5-10 percent; species as indicated on drawings.
B. Hardwood Lumber: NHLA; Graded in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Grade II/Custom; average moisture content of 5-10 percent; species as indicated on drawings.

2.03 PANEL MATERIALS
A. Particleboard: ANSI A208.1; medium density industrial type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, composed of wood chips bonded with interior grade adhesive under heat and pressure; sanded faces; thickness as required; use for components indicated on drawings.
B. Medium Density Fiberboard (MDF): ANSI A208.2; type as specified in AWI/AWMAC Architectural Woodwork Quality Standards Illustrated; composed of wood fibers pressure bonded with moisture resistant adhesive to suit application; sanded faces; thickness as required.
C. Plywood for Non-Decorative Purposes: NIST PS 1, Interior rated adhesives, core of seven (7) wood plies from listed species unless otherwise indicated, thickness as indicated or as required by application.
   2. Concealed Surfaces: PS 1; APA B-B Grade, rotary cut Douglas fir face veneer.
   3. Location: At countertops and base cabinets in all sink and lavatory locations.
D. Hardboard: AHA A135.4; Pressed wood fiber with resin binder, Class 1 - Tempered, 1/4 inch thick, smooth two sides (S2S); use for drawer bottoms, dust panels, and other components indicated on drawings.
E. Pre-Finished High Density Particle Board (PFHDPB)

2.04 LAMINATE MATERIALS
A. Provide specific types as indicated.
   1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, through color, color as selected, finish as selected.
   2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, through color, color as selected, finish as selected.

2.05 COUNTERTOPS
A. Plastic Laminate Countertops: Medium density fiberboard substrate covered with HPDL, conventionally fabricated, with decorative PVC edge.
B. Solid Surfacing-Material Countertops:
   1. Corian or equal.
   2. Location: Reception upper countertops.

2.06 ACCESSORIES
A. Adhesive: Type recommended by fabricator to suit application.
B. Typical Plastic Edge Banding/Profile: Radius edge with thick applied band, 0.12 inch thick, 1/8 inch nominal (3 mm) radius edge with thick applied band shaped; smooth finish; of width to match component thickness, color as selected from manufacturer's standards.
   1. Use at all drawer and door edges.
C. Other Edge Banding/Profile: Impact resistant HPDL or PVC edge banding, square edge with thin applied band, 1/16 inch thick, square edge with thin applied band, flat shaped; smooth finish; of width to match component thickness
   1. Use at all exposed shelf edges, casework boxes. Ease edge of banding to remove any sharp edges.
D. Grommets: Standard plastic grommets for cut-outs, in color to match adjacent surface.
E. Concealed Station Brackets:
1. Product: "C" (Concealed Bracket), "EC" (Extended Concealed Bracket); steel, black powder coat, mounting hardware included (3/8" - 16 x 3" carriage bolt assemblies); manufactured by A & M Hardware, Inc.; www.AandMhardware.com; 1-888-647-0200.
   a. "C", without upper extension:
      1) 9" Support Arm, 4,520 lbs/pair load limit
      2) 12" Support Arm, 4,020 lbs/pair load limit
      3) 18" Support Arm, 2,060 lbs/pair load limit
      4) 24" Support Arm, 1,800 lbs/pair load limit
   b. "EC", with upper extension:
      1) 9" Support Arm, 7,960 lbs/pair load limit
      2) 12" Support Arm, 3,100 lbs/pair load limit
      3) 18" Support Arm, 4,500 lbs/pair load limit
      4) 24" Support Arm, 2,320 lbs/pair load limit
2. Substitutions: See Section 01-6000 - Product Requirements.

2.07 HARDWARE
   A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.
   B. Adjustable Shelf Supports: Standard side-mounted system using multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch spacing adjustments.
   C. Drawer and Door Pulls: "U" shaped wire pull, steel with satin finish, 4 inch centers.
   D. Catches: Touch type.
   E. Drawer Slides:
      1. Type: Full extension.
      2. Static Load Capacity: Commercial grade.
      3. Manufacturers:
   F. Hinges: European style concealed self-closing type, steel with polished finish.
      1. Manufacturers:
         a. Blum, Inc: www.blum.com/#sle, or equal.

2.08 FABRICATION
   A. Cabinet Style: Flush overlay.
   B. Cabinet Doors and Drawer Fronts: Flush style.
   C. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.
   D. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.
   E. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Locate counter butt joints minimum 2 feet from sink cut-outs.
      1. Cap exposed plastic laminate finish edges with material of same finish and pattern.
   F. Solid Surfacings-Material: Fabricate tops on one piece, unless otherwise indicated. Comply with solid surfacing-material manufacturer's written recommendations for adhesives, sealer, fabrication and finishing.
   G. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

2.09 FACTORY FINISHING
   A. Finish work in accordance with AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Section 1500, Nitrocellulose Lacquer, Transparent.
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.
C. Install cantilevered counter support arms prior to gypsum board installation. Coordinate with rough framing and add studs as necessary to locate arms in correct location.

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. 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.
B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING
A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION
SECTION 07-2100
THERMAL INSULATION

PART 1  GENERAL

1.01  SECTION INCLUDES
A.  Batt insulation and vapor retarder in exterior wall construction.
B.  Sound Batt Insulation in Sound Walls.
C.  Rigid Cellular Polystyrene Thermal Insulation for filling perimeter window and door shim spaces, crevices in exterior wall and roof, and at exterior wall headers.

1.02  RELATED REQUIREMENTS
A.  Section 06-1000 - Rough Carpentry: Supporting construction for batt insulation.

1.03  REFERENCE STANDARDS

1.04  FIELD CONDITIONS
A.  Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

1.05  LABELING REQUIREMENTS
A.  Building Thermal Envelope Insulation:
   1.  An R-value identification mark is applied (by manufacturer) to each piece of insulation 12 inches or greater in width.
   2.  Alternately, the insulation installers have provided a signed, dated and posted certification listing the type, manufacturer and R-value of installation installed.
B.  Insulation Mark Installation:
   1.  Insulation materials are installed such that the manufacturer's R-value is readily observable upon inspection.
C.  Insulation Product Rating:
   1.  The thermal resistance (R-value) of insulation has been determined in accordance with the US FTC R-value rule.

PART 2  PRODUCTS

2.01  MANUFACTURERS
A.  Insulation:
   5.  Substitutions:  See Section 016000 - Product Requirements.

2.02  APPLICATIONS
A.  Insulation in Wood Framed Walls:  Batt insulation with integral vapor retarder.
B. Insulation behind window and door headers (interior side): Rigid, Cellular Polystyrene Thermal Insulation.

2.03 FOAM BOARD INSULATION MATERIALS
A. Expanded Polystyrene (EPS) Board Insulation: ASTM C578, Type XI; with the following characteristics:
   1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   2. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
   3. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
   5. Board Density: 0.7 lb/cu ft.
   7. Location: at headers.

2.04 BATT INSULATION MATERIALS
A. Where batt insulation is indicated, use glass fiber batt insulation.
B. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
C. Batt Insulation: ASTM C 665; preformed batt; friction fit, conforming to the following:
   1. Material: Glass fiber.
   2. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
   3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
   5. Thermal Resistance: R of [21, 30 and 38].
   6. Thickness: 5-1/2", 9-1/2" and 12" inch, refer to Drawings for R-values locations.
      a. Floor: R-25
      b. Walls: R-21
      c. Roof (attic area): R-38.
   7. Vapor Barrier Facing: Aluminum foil, flame spread 25 rated; one side (or equivalent), when not in direct contact with finish material, paper face elsewhere.
D. Glass Fiber Sound Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C 665; friction fit.
   1. Density: 0.8 pcf.
   2. Thickness: 3 inch.
   3. Manufacturers:
      a. Same as above.
   4. Locations: Typical throughout building, except as noted for SAFB below.

2.05 ACCESSORIES
A. Tape: Bright aluminum self-adhering type, mesh reinforced, 2 inch wide, at foil face vapor barrier areas, polyester elsewhere.
B. Nails or Staples: Steel wire; electroplated or galvanized; type and size to suit application.
C. Wire: Galvanized steel.
D. Support tape: Nylon reinforced or as approved by manufacture.
E. Adhesive: Type recommended by insulation manufacturer for application.

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.
3.02 BOARD INSTALLATION AT EXTERIOR WALLS
   A. Install boards horizontally on walls (at headers).
      1. Install in running bond pattern.
      2. Butt edges and ends tightly to adjacent boards and to protrusions.
   B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane and in gaps / shimmed spaces.

3.03 BATT INSTALLATION
   A. Install insulation and vapor retarder in accordance with manufacturer’s instructions.
   B. Install in exterior wall spaces without gaps or voids. Do not compress insulation.
   C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
   D. Fit insulation tightly to exterior side of mechanical and electrical services within the plane of the insulation.

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

END OF SECTION
SECTION 07-2500
WEATHER BARRIERS

PART 1 GENERAL
1.01 SECTION INCLUDES

A. Water-Resistive Barrier: Under exterior wall cladding, over sheathing or other substrate; not air tight or vapor retardant.

B. Vapor Retarders: Materials to make exterior walls, joints between exterior walls and roof, and joints around frames of openings in exterior walls water vapor resistant and air tight.

1.02 RELATED REQUIREMENTS

A. Section 03-3000 - Cast-in-Place Concrete: Vapor retarder under concrete slabs on grade.

B. Section 06-1000 - Rough Carpentry: Water-resistive barrier under exterior cladding.

C. Section 07-2100 - Thermal Insulation: Vapor retarder installed in conjunction with batt insulation.

D. Section 07-4270 - Aluminum Composition Material Wall Panels: Weather barrier.

E. Section 07-5400 - Thermoplastic Membrane Roofing: Vapor retarder installed as part of roofing system.

F. Section 07-9005 - Joint Sealers: Sealant materials and installation techniques.

1.03 DEFINITIONS

A. Weather Barrier: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Air Barrier: Air tight barrier made of material that is relatively air impermeable but water vapor permeable, both to the degree specified, with sealed seams and with sealed joints to adjacent surfaces. Note: For the purposes of this specification, vapor impermeable air barriers are classified as vapor retarders.

C. Vapor Retarder: Air tight barrier made of material that is relatively water vapor impermeable, to the degree specified, with sealed seams and with sealed joints to adjacent surfaces.

1. Water Vapor Permeance: For purposes of conversion, 57.2 ng/(Pa s sq m) = 1 perm.

1.04 REFERENCE STANDARDS


1.05 SUBMITTALS

A. See Section 01-3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on material characteristics.

C. Manufacturer's Installation Instructions: Indicate preparation, installation methods, and storage and handling criteria.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the materials manufacturers before, during and after installation.

PART 2 PRODUCTS
2.01 AIR BARRIER MATERIALS (WATER VAPOR PERMEABLE AND WATER-RESISTIVE)

A. Self-Adhered Water Resistant Air Barrier Membrane:

1. Water Vapor Permeance: 29 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure A (desiccant method).
2. Dry Film Thickness: 28 mils (0.028 inch), minimum.
5. Surface Burning Characteristics: Flame spread index of 25 or less, and smoke developed index of 50 or less, when tested in accordance with ASTM E84.
6. Manufacturers:
   a. Henry Company, Blueskin VP 160..
   b. Substitutions: See Section 01-6000 - Product Requirements.

2.02 SELF-ADHERING FLASHING
   A. Manufacturer and Product:
      2. Henry Company, Blueskin SA.
      3. Substitutions: See Section 01-6000 - Product Requirements.
   B. Materials: Rubberized asphalt and polyethylene. 40 mils thickness.
   C. Location: Around all wall openings and where noted on drawings.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that surfaces and conditions are ready to accept the work of this section.

3.02 PREPARATION
   A. Remove projections, protruding fasteners, and loose or foreign matter that might interfere with proper installation.

3.03 INSTALLATION
   A. Install materials in accordance with manufacturer's instructions.
   B. Air Barriers: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
   C. Vapor Retarders: Install continuous air tight barrier over surfaces indicated, with sealed seams and with sealed joints to adjacent surfaces.
   D. Self-Adhered Sheets:
      1. All surfaces to receive membrane must be dry and clean of oil, dust, fronts, bulk water and other contaminants that would be detrimental to adhesion of membrane. Approved adhesive -primer to be applied as recommended by Membrane manufacturer. Primer required for applications below 40 degrees, not required above 40 degrees temperature.
      2. Prepare substrate in manner recommended by sheet manufacturer; fill and tape joints in substrate and between dissimilar materials.
      3. Lap sheets shingle-fashion to shed water and seal laps air tight.
      4. Once sheets are in place, press firmly into substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
      5. Use same material, or other material approved by sheet manufacturer for the purpose, to seal to adjacent construction and as flashing.
      6. At wide joints, provide extra flexible membrane allowing joint movement.
   E. Openings and Penetrations in Exterior Weather Barriers:
      1. Install flashing over sills, covering entire sill frame member, extending at least 5 inches onto weather barrier and at least 6 inches up jambs; mechanically fasten stretched edges.
      2. At openings to be filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches wide; do not seal sill flange.
      3. At openings to be filled with non-flanged frames, seal weather barrier to each side of opening framing, using flashing at least 9 inches wide, covering entire depth of framing.
4. At interior face of openings, seal gap between window/door frame and rough framing, using joint sealant over backer rod.
5. Service and Other Penetrations: Form flashing around penetrating item and seal to weather barrier surface.
6. Refer to Drawings for additional placement requirements, and coordination placement with metal flashings.

3.04 FIELD QUALITY CONTROL

A. See Section 01-4000 - Quality Requirements, for additional requirements.
B. Coordination of ABAA Tests and Inspections:
   1. Provide testing and inspection required by ABAA QAP.
   2. Notify ABAA in writing of schedule for air barrier work, and allow adequate time for testing and inspection.
   3. Cooperate with ABAA testing agency.
   4. Allow access to air barrier work areas and staging.
   5. Do not cover air barrier work until tested, inspected, and accepted.
C. Do not cover installed weather barriers or vapor retarders until inspections have been completed.

3.05 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION
SECTION 07-4646
FIBER-CEMENT SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Fiber-cement siding.

1.02 RELATED REQUIREMENTS
A. Section 06-1000 - Rough Carpentry:
B. Section 07-2500 - Weather Barriers: Weather barrier under siding.
C. Section 07620 - Sheet Metal Flashing and Trim
D. Section 07-9005 - Joint Sealers.
E. Section 09-9113 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Manufacturer's requirements for related materials to be installed by others.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods, including nail patterns.
C. Test Report: Applicable model code authority evaluation report (e.g. ICC-ES).
D. Maintenance Instructions: Periodic inspection recommendations and maintenance procedures.
E. Warranty: Submit copy of manufacturer's warranty, made out in Owner's name, showing that it has been registered with manufacturer.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in performing work of the type specified in this section with minimum three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Store products under waterproof cover and elevated above grade, on a flat surface.

PART 2 PRODUCTS

2.01 FIBER-CEMENT SIDING
A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying to ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
   2. Texture: Simulated cedar grain.
   3. Length: 12 ft, nominal.
   5. Thickness: 5/16 inch, nominal.
   7. Manufacturers:
         1) HZ10 system required for this region.
      b. Substitutions: See Section 01-6000 - Product Requirements.
B. Fascia Panels: Panels giving appearance of multiple shingles made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
   1. Style: Vertical siding panels.
   2. Texture: Cedar mill.
   3. Length: 12 feet.
   4. Width (Height): 48 inches.
   5. Thickness: 5/16 inch, nominal.
   7. Manufacturers:
      a. Same as lap siding.

C. Soffit Panels: Panels made of cement and cellulose fiber formed under high pressure with integral surface texture, complying with ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.

D. Trim and Battens
   1. Texture: Rustic
   2. Length: 12 feet, nominal.
   3. Width: 5.5 inches (verify with size of existing battens.)
   4. Thickness: ¾”
   5. Finish: Unfinished.
   6. Manufacturer: Same as Lap Siding

202 ACCESSORIES

A. Trim: Same material and texture as siding.
B. Location: At roof parapet / fascia.
C. Fasteners: Galvanized or corrosion resistant; length as required to penetrate sheathing and stud a minimum of 1-1/4 inch.
D. Sheet Metal Flashing: 8 inch wide metal flashing under butt joints of siding, per manufacturers recommendations.
E. Joint Sealer: As specified in Section 07-9005.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.
B. Verify that weather barrier has been installed over substrate completely and correctly.
C. Do not begin until unacceptable conditions have been corrected.
D. If substrate preparation is responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Install Sheet Metal Flashing:
   1. Above door and window trim and casings.
   2. Above horizontal trim in field of siding.

3.03 INSTALLATION

A. Install in accordance with manufacturer’s instructions and recommendations.
   1. Read warranty and comply with terms necessary to maintain warranty coverage.
   2. Use trim details indicated on drawings.
   3. Touch up field cut edges before installing.
   4. Pre-drill nail holes to prevent breakage.

B. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.
C. Over Steel Studs: Use hot-dipped galvanized self-tapping screws, with the points of at least three screws penetrating each stud the panel crosses and at panel ends.

D. Allow space for thermal movement between both ends of siding panels that butt against trim; seal joint between panel and trim with specified sealant.

E. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses. Install 8 inch wide X 8 inch high flashing behind butt joints in the field (not required at corners). Lap flashing over the previous course of siding.

F. Do not install siding less than 6 inches from surface of ground nor closer than 1 inch to roofs, patios, porches, and other surfaces where water may collect.

G. After installation, seal joints except lap joints of lap siding; seal around penetrations, and paint exposed cut edges.

H. Finish Painting: Refer to Section 09-9113.

### 3.04 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

**END OF SECTION**
SECTION 07-5419
PVC THERMOPLASTIC SINGLE-PLY ROOFING

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Mechanically attached PVC thermoplastic roofing membrane, typical.
B. Adhered system with PVC thermoplastic roofing membrane, at vertical parapet surfaces.
C. Insulation.
D. Vapor retarder.
E. Roofing stack boots and walkway pads.
F. Roof board.

1.02 RELATED REQUIREMENTS
A. Section 07-6200 - Sheet Metal Flashing and Trim: Counterflashings, reglets.
B. Section 07-7200 - Roof Accessories: Roof-mounted units; prefabricated curbs, ladder, and access hatch.

1.03 REFERENCE STANDARDS
E. FM DS 1-29 - Roof Deck Securement and Above-Deck Roof Components; Factory Mutual System; 2006.

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide manufacturer's written information listed below.
   1. Product data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.
   2. Preparation instructions and recommendations.
C. Warranty:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's certification that installation complies with all warranty conditions for the waterproof membrane.

1.05 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum twenty (20) years of documented experience.
B. Installer Qualifications: Company specializing in performing the work of this section:
   1. With minimum five (5) years documented experience.
   2. Approved by membrane manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.
B. Store products in weather protected environment, clear of ground and moisture.
C. Protect foam insulation from direct exposure to sunlight.

1.07 WARRANTY
A. See Section 01-7800 - Closeout Submittals, for additional warranty requirements.
B. Material Warranty: Provide membrane manufacturer's warranty agreeing to replace material that shows manufacturing defects within 20 years after installation.
C. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 20 years No Dollar Limit total system warranty.
   2. For repair and replacement include costs of both material and labor in warranty.

PART 2 PRODUCTS
2.01 MANUFACTURER
A. Thermoplastic PVC Membrane Roofing:
   1. Carlisle SureFlex PVC.

2.02 ROOFING APPLICATIONS
A. PVC Membrane Roofing: One ply membrane, mechanically fastened, over vapor retarder and insulation, and roof cover board.
B. Roofing Assembly Performance Requirements and Design Criteria:
   1. Roof Covering External Fire Resistance Classification: UL Class A when tested per UL 790.
   2. Factory Mutual Classification: Class I and windstorm resistance of I-90, in accordance with FM DS 1-28.

2.03 ROOFING MEMBRANE AND ASSOCIATED MATERIALS
A. Membrane:
   1. Material: Polyvinyl chloride (PVC) complying with ASTM D4434/D4434M.
   3. Thickness: 60 mils (0.060 inch), minimum.
   4. Sheet Width: Factory fabricated into largest sheets possible.
B. Seaming Materials: As recommended by membrane manufacturer.
C. Membrane Fasteners: As recommended and approved by membrane manufacturer.
D. Vapor Retarder: Material approved by roof manufacturer complying with requirements of fire rating classification; compatible with roofing and insulation materials.
   1. Fire-retardant adhesive.
E. Flexible Flashing Material: Same material as membrane.

2.04 ROOF BOARD
A. Deck Sheathing and Cover Board: Glass mat faced gypsum panels, ASTM C1177/C1177M, fire resistant type, 1/4 inch thick.

2.05 INSULATION
A. Polyisocyanurate (ISO) Board Insulation: ASTM C1289, Type II, Class 1- Faced with aluminum foil on both major surfaces of the core foam; non-reinforced core foam.
   1. Grade and Compressive Strength: Grade 2, 20 psi, minimum.
2. Tapered Board: Slope as indicated; minimum thickness 1/4 inch; fabricate of fewest layers possible.
3. Product:
   a. Approved by membrane manufacturer.

2.06 ACCESSORIES
A. Prefabricated Flashing Accessories:
   1. Corners and Seams: Same material as membrane, in manufacturer's standard thicknesses.
   2. Penetrations: Same material as membrane, with manufacturer's standard cut-outs, rigid inserts, clamping rings, and flanges.
   3. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
      b. Locate around all mechanical equipment on roof. Refer to Drawings for additional layout.
   4. Miscellaneous Flashing: Non-reinforced PVC membrane; 80 mils (0.080 inch) thick, in manufacturer's standard lengths and widths.
B. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.
C. Membrane Adhesive: As recommended by membrane manufacturer.
D. Surface Conditioner for Adhesives: Compatible with membrane and adhesives.
E. Sealants: As recommended by membrane manufacturer.
F. Cleaner: Manufacturer's standard, clear, solvent-based cleaner.
G. Edgings and Terminations: Manufacturer's standard edge and termination accessories.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that surfaces and site conditions are ready to receive work.
B. Verify deck is supported and secure.
C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.
D. Verify deck surfaces are dry and free of snow or ice.
E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 PREPARATION, GENERAL
A. Clean substrate thoroughly prior to roof application.
B. Do not begin work until other work that requires foot or equipment traffic on roof is complete.
C. Apply manufacturer's recommended vapor retarder or temporary roof before roof installation.

3.03 WOOD DECK PREPARATION
A. Verify flatness and tightness of joints of wood decking. Verify that all wood decking edges are fully supported. Fill knot holes with latex filler or completely cover with securely nailed sheet metal.
B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

3.04 INSTALLATION - GENERAL
A. Perform work in accordance with manufacturer's instructions and NRCA (RM) applicable requirements.
B. Do not apply roofing membrane during unsuitable weather.
C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.05 INSTALLATION - GENERAL

A. Perform work in accordance with manufacturer's instructions.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.06 INSULATION

A. Apply vapor retarder to sheathing surface with adhesive in accordance with manufacturer's instructions.
   1. Extend vapor retarder under cant strips and blocking to deck edge.
   2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Ensure vapor retarder is clean and dry, continuous, and ready for application of insulation.

C. Attachment of Insulation:
   1. Mechanically fasten insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements. Do not penetrate through roof deck. Underside of roof deck is exposed inside the building.

D. Lay subsequent layers of insulation with joints staggered minimum 6 inch from joints of preceding layer.

E. Lay boards with edges in moderate contact without forcing, and gap between boards no greater than 1/4 inch. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

F. Do not apply more insulation than can be completely waterproofed in the same day.

3.07 MEMBRANE APPLICATION

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive to substrate at rate recommended by adhesive manufacturer. Fully embed membrane in adhesive except in areas directly over or within 3 inches of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

D. Seam Welding:
   1. Seam Welding: Overlap edges and ends and seal seams by heat welding, minimum 2 inches.
   2. Cover all seams with manufacturer's recommended joint covers.
   3. Probe all seams once welds have thoroughly cooled. (Approximately 30 minutes.)
   4. Repair all deficient seams within the same day.
   5. Seal cut edges of reinforced membrane after seam probe is complete.

E. Mechanical Attachment:
   1. Apply membrane and mechanical attachment devices in accordance with manufacturer's instructions.
F. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 4 inches onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.

G. Coordinate installation of roof drains, sumps, curbs, roof accessories, and related flashings.

H. Daily Seal: Install daily seal per manufacturers instructions at the end of each work day.
   Prevent infiltration of water at incomplete flashings, terminations, and at unfinished membrane edges.

END OF SECTION
SECTION 07-6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, sheet metal roofing, and other items indicated in Schedule.
B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS
A. Section 06-1000 - Rough Carpentry: Wood nailers for sheet metal work.
B. Section 07-5419- PVC Thermoplastic Single Ply Roofing: Roofing system.
C. Section 07-7123 - Manufactured Gutters and Downspouts.
D. Section 07-9005 - Joint Sealers.

1.03 REFERENCE STANDARDS
A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2015.
C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.05 QUALITY ASSURANCE
A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.
B. Fabricator and Installer Qualifications: Company specializing in sheet metal work with ____ years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING
A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS
2.01 SHEET MATERIALS
A. Pre-Finished Galvanized Steel: ASTM A 653/A 653M, with G90/Z275 zinc coating; minimum 0.02 inch (24 gauge) thick base metal, shop pre-coated with modified silicone coating.
2. PVDF (Polyvinylidene Fluoride) Coating: Superior Performance Organic Finish, AAMA 2605; multiple coat, thermally cured fluoropolymer finish system; color as scheduled.

B. Stainless Steel: ASTM A666, Type 304 alloy, soft temper, 28 gage, (0.0156 inch) thick; smooth No. 4 - Brushed finish.

2.02 ACCESSORIES
A. Fasteners: Galvanized steel, with soft neoprene washers.
B. Primer: Zinc chromate type.
C. Protective Backing Paint: Zinc molybdate alkyd.
D. Sealant to be Concealed in Completed Work: Non-curing butyl sealant.
E. Sealant to be Exposed in Completed Work: 1; elastomeric sealant, 100 percent silicone with minimum movement capability of plus/minus 25 percent and recommended by manufacturer for substrates to be sealed; clear.
F. Sealant: Type 1 specified in Section 07-9005.
G. Plastic Cement: 1, Type I.

2.03 FABRICATION
A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
B. Form pieces in longest possible lengths.
C. Hem exposed edges on underside 1/2 inch; miter and seam corners.
D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.
E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.
G. Fabricate flashings to allow toe to extend 2 inches over roofing edge. Return and brake edges.

PART 3 EXECUTION
3.01 PREPARATION
A. Install starter and edge strips, and cleats before starting installation.
B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.02 INSTALLATION
A. Comply with drawing details.
B. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted.
C. Apply plastic cement compound between metal flashings and felt flashings.
D. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.
E. Seal metal joints watertight.
F. Secure gutters and downspouts in place with concealed fasteners.
G. Slope gutters 1/8 inch per foot minimum.
H. Connect downspouts to downspout boots, and grout connection watertight.

3.03 FIELD QUALITY CONTROL
A. See Section 01-4000 - Quality Requirements, for field inspection requirements.
B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION
SECTION 07-8400
FIRESTOPPING

PART 1  GENERAL
1.01  SECTION INCLUDES
   A.  Firestopping systems.

1.02  SUBMITTALS
   A.  See Section 01-3000 - Administrative Requirements, for submittal procedures.

1.03  QUALITY ASSURANCE
   A.  Fire Testing:  Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   B.  Manufacturer Qualifications:  Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

PART 2  PRODUCTS
2.01  MANUFACTURERS
   A.  Firestopping Manufacturers:

2.02  MATERIALS
   A.  Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories:  Provide type of materials as required for tested firestopping assembly.

2.03  FIRESTOPPING SYSTEMS

PART 3  EXECUTION
3.01  INSTALLATION
   A.  Install materials in manner described in fire test report and in accordance with manufacturer’s instructions, completely closing openings.

END OF SECTION
SECTION 07-9005
JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Sealants and joint backing.

1.02 RELATED REQUIREMENTS
A. Section 07-2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders:
B. Section 09-2116 - Gypsum Board Assemblies: Acoustic sealant.

1.03 REFERENCE STANDARDS
D. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the work with other sections referencing this section.

1.05 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.

1.06 FIELD CONDITIONS
A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.01 SEALANTS
A. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25 minimum; Uses M, G, and A; single component.
   1. Color: color as selected.
   2. Product: Sonolastic NP-1 manufactured by BASF.
   3. Applications: Use for:
      a. Control, expansion, and soft joints in masonry.
      b. Joints between concrete and other materials.
      c. Joints between metal frames and other materials.
      d. Joints at wood siding and trim as indicated.
      e. Other exterior joints for which no other sealant is indicated.
   4. Test Data:
      a. Movement capability, % - +100 to -50.
      b. Tensile strength - 250 psi.
      c. Ultimate elongation at break, % - 1000.
B. Type 2 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
   1. Color: Match adjacent finished surfaces.
   2. Product: Sonalac manufactured by BASF.
   3. Applications: Use for:
      a. Interior wall and ceiling control joints.
      b. Joints between door and window frames and wall surfaces.
c. Other interior joints for which no other type of sealant is indicated.

2.02 ACCESSORIES
   A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
   B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
   C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
   D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION
   A. Verify that substrate surfaces are ready to receive work.
   B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION
   A. Remove loose materials and foreign matter that could impair adhesion of sealant.
   B. Clean and prime joints in accordance with manufacturer's instructions.
   C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
   D. Protect elements surrounding the work of this section from damage or disfigurement.

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 the following, unless otherwise indicated:
      2. Neck dimension no greater than 1/3 of the joint width.
      3. Surface bond area on each side not less than 75 percent of joint width.
   D. Install bond breaker where joint backing is not used.
   E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
   F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
   G. Tool joints concave.

3.04 CLEANING
   A. Clean adjacent soiled surfaces.

3.05 PROTECTION
   A. Protect sealants until cured.

3.06 SCHEDULE
   A. Exterior Joints for Which No Other Sealant Type is Indicated: Type 1.
   B. Interior Joints for Which No Other Sealant is Indicated: Type 2.

END OF SECTION
SECTION 08-1416
FLUSH WOOD DOORS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, acoustical, and special function.

1.02 RELATED REQUIREMENTS
   A. Section 08705 - Door Hardware.
   B. Section 08-8000 - Glazing.
   C. Section 09-9000 - Painting and Coating.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
   C. Samples: Submit two samples of door veneer, 12 by 12 inch in size illustrating wood grain, stain color, and sheen.

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.

PART 2 PRODUCTS
2.01 MANUFACTURERS
   A. Wood Veneer Faced Doors:
      1. Masonite, Aspiro services: masonitearchitectural.com
      9. Substitutions: See Section 01-6000 - Product Requirements.

2.02 DOORS
   A. Doors: Refer to drawings for locations and additional requirements.
      1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with WDMA I.S. 1A.
      2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
   B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.
      1. Provide solid core doors at each location.
      2. Wood veneer facing for field transparent finish as indicated on drawings.
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.
   B. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.
   C. Sound-Rated Doors: Equivalent to type, with particleboard core (PC) construction as required to achieve STC rating specified; plies and faces as indicated above.

2.04 DOOR FACINGS
   A. Veneer Facing for Transparent Finish: Match Species, grade, cut, finish of existing flush wood doors.

2.05 ACCESSORIES
   A. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

2.06 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 for hardware reinforcement.
      2. Provide solid blocking for other throughbolted hardware.
   C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.
   D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.

2.07 FACTORY FINISHING - WOOD VENEER DOORS
   A. Finish work in accordance with WDMA I.S. 1A for grade specified and as follows:
   B. Factory finish doors in accordance with specified quality standard:
      1. Transparent Finish: Transparent conversion varnish, Premium quality, high gloss sheen.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that opening sizes and tolerances are acceptable.
   B. 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.
      1. Install fire-rated doors in accordance with NFPA 80 requirements.
   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.
   E. Coordinate installation of glazing.

3.03 TOLERANCES
   A. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taut string, corner to corner, over an imaginary 36 by 84 inches surface area.
   B. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.
C. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

3.04 ADJUSTING
   A. Adjust doors for smooth and balanced door movement.
   B. Adjust closers for full closure.

3.05 SCHEDULE
   A. Refer to Door and Hardware Schedule appended to Division 8.

END OF SECTION
SECTION 08-5313
VINYL WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Vinyl-framed, factory-glazed windows.
B. Factory fabricated tubular extruded plastic windows with fixed and operating sash.
C. Factory glazed.
D. Operating hardware.
E. Insect screens.

1.02 RELATED REQUIREMENTS
A. Section 07-9005 - Joint Sealers: Perimeter sealant and back-up materials.
B. Section 08-8000 - Glazing.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide component dimensions, anchors, fasteners, glass, and internal drainage.
C. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
   1. Evidence of AAMA Certification.
   2. Evidence of WDMA Certification.
   3. Evidence of CSA Certification.
   4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Vinyl Windows:
   2. Substitutions: See Section 01-6000 - Product Requirements.

2.02 DESCRIPTION
A. Vinyl Windows: Factory fabricated frame and sash members of extruded, hollow, ultra-violet-resistant, polyvinyl chloride (PVC) with integral color; with factory-installed glazing, hardware, related flashings, anchorage and attachment devices.
   1. Configuration: As indicated on drawings.
   3. Size to fit openings with minimum clearance around perimeter of assembly providing necessary space for perimeter seals.
   4. Framing Members: Fusion welded corners and joints, with internal reinforcement where required for structural rigidity; concealed fasteners.
   5. System Internal Drainage: Drain to exterior side by means of weep drainage network any water entering joints, condensation within glazing channel, or other migrating moisture within system.
B. Performance Requirements: Provide products that comply with the following:
   1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
      a. Performance Class (PC): R.
   2. Performance Validation: Windows shall comply with AAMA/WDMA/CSA 101/I.S.2/A440
      performance requirements as indicated by having AAMA, WDMA, or CSA certified label, or
      an independent test report for indicated products itemizing compliance and acceptable by
      authorities having jurisdiction.
   3. 120 Mile per hour design wind gust speed.
   4. Structural Class: F-C40
   5. EdgeGard Max spacers.
   6. Energy Star South Central SunCoat Max Low-E3, Location: West windows.

2.03 COMPONENTS
   A. Glazing: Insulated double pane, annealed glass, clear, low-E coated, argon filled, with glass
      thicknesses as recommended by manufacturer for specified wind conditions and acoustic rating
      indicated.
   B. Windows: Extruded, hollow, tubular, ultra-violet resistant polyvinyl chloride (PVC) with integral
      color; factory fabricated; with vision glass, related flashings, anchorage and attachment devices.
      2. Configuration: Fixed, non-operable.
   C. Frames: Standard profile; 1 - 3/8 inch nail fin setback, flush glass stops of screw fastened
      type.

2.04 GLASS AND GLAZING MATERIALS

2.05 HARDWARE
   A. Horizontal Sliding Sash: Rigid PVC interfacing tracks with dual brass wheel and stainless steel
      axle assembly housing, provide two sets for each operating sash and opening stops in head
      and sill track as required.
   B. Vertical Sliding Sash: Metal and nylon spiral friction slide cylinder, provide two for each sash
      and jamb.
   C. Sash lock: Lever handle and keeper with cam lock, provide at least one for each operating
      sash.
   D. Finish For Exposed Hardware: Stainless Steel.

2.06 FABRICATION
   A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in a rigid
      jig. Supplement frame sections with internal reinforcement where required for structural rigidity.
   B. Form snap-in glass stops, closure molds, weather stops, and flashings of extruded PVC for tight
      fit into window frame section.
   C. Arrange fasteners to be concealed from view.
   D. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide
      internal drainage of glazing spaces to exterior through weep holes.
   E. Factory glaze window units.

PART 3 EXECUTION

3.01 INSTALLATION
   A. Install window unit assemblies in accordance with manufacturers instructions and applicable
      building codes.
   B. Attach window frame and shims to perimeter opening to accommodate construction tolerances
      and other irregularities as necessary.
C. Align window plumb and level, free of warp or twist, and maintain dimensional tolerances and alignment with adjacent work.

3.02 ADJUSTING
A. Adjust hardware for smooth operation and secure weathertight closure.

3.03 CLEANING
A. Remove protective material from pre-finished surfaces.
B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.
C. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer and appropriate for application indicated.

END OF SECTION
## DOOR SCHEDULE

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<th>Room Name</th>
<th>Door No.</th>
<th>Size (WxH)</th>
<th>Type</th>
<th>Material</th>
<th>Frame</th>
<th>Hardware Group</th>
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<th>Jamb</th>
<th>Head</th>
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<td>3'-6&quot;</td>
<td>B</td>
<td>WD</td>
<td>WD</td>
<td></td>
<td>---</td>
<td>4 / A5.2</td>
<td>---</td>
<td></td>
<td>4 / A5.2</td>
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</tr>
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<td>Hall 118</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Not used</td>
</tr>
<tr>
<td>Hall 119</td>
<td>119</td>
<td>3'-6&quot;</td>
<td>B</td>
<td>WD</td>
<td>WD</td>
<td></td>
<td>---</td>
<td>4 / A5.2</td>
<td>---</td>
<td></td>
<td>4 / A5.2</td>
<td>Sound door.</td>
</tr>
<tr>
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<td>120</td>
<td>4'-0&quot;</td>
<td>A</td>
<td>WD</td>
<td>WD</td>
<td></td>
<td>4 / A5.2</td>
<td>4 / A5.2</td>
<td>---</td>
<td></td>
<td>4 / A5.2</td>
<td>20 min Electronic Hold-Open</td>
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<td>Hall 121</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
<td>Not used</td>
</tr>
<tr>
<td>Office 122</td>
<td>122</td>
<td>3'-0&quot;</td>
<td>B</td>
<td>WD</td>
<td>WD</td>
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<td>---</td>
<td>4 / A5.2</td>
<td>---</td>
<td></td>
<td>4 / A5.2</td>
<td>---</td>
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<tr>
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<td>123</td>
<td>3'-0&quot;</td>
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<td>WD</td>
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<td>---</td>
<td>4 / A5.2</td>
<td>---</td>
<td></td>
<td>4 / A5.2</td>
<td>--- Provide Occupancy Latch</td>
</tr>
</tbody>
</table>

Conf. Tribes of Coos, Lower Umpqua and Siuslaw Indians - Dental Clinic Renovation, Project #17.10
March 2019
<table>
<thead>
<tr>
<th>Room Name</th>
<th>Door No.</th>
<th>Size (WxH)</th>
<th>Type</th>
<th>Material</th>
<th>Frame</th>
<th>Hardware Group</th>
<th>Details: Sheet A5.1 unless noted otherwise</th>
<th>Rating</th>
<th>Remarks</th>
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<tr>
<td>Patient Toilet 124</td>
<td>124</td>
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<td>A</td>
<td>WD</td>
<td>WD</td>
<td>---</td>
<td>4 / A5.2</td>
<td>4 / A5.2</td>
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<td>125</td>
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<td>A</td>
<td>WD</td>
<td>WD</td>
<td>---</td>
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<td>4 / A5.2</td>
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<tr>
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<tr>
<td>COUNSEL 127</td>
<td>127</td>
<td>30 - 68</td>
<td>C</td>
<td>WD</td>
<td>WD</td>
<td>---</td>
<td>4 / A5.2</td>
<td>4 / A5.2</td>
<td></td>
</tr>
<tr>
<td>HALL 128</td>
<td>128</td>
<td>30 - 68</td>
<td>A</td>
<td>MTL</td>
<td>HM</td>
<td>11 / A5.2</td>
<td>7 / A5.2</td>
<td>3 / A5.2</td>
<td>Re-use existing exterior door.</td>
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</tbody>
</table>

Legend

AL - Aluminum Storefront System
HM - Hollow Metal
KD - Knock Down Steel Frame (Timely)
SS - Stainless Steel
WD - Wood
(E) - Existing

Door Types

- **A**
- **B**
- **C**
- **D**
- **E**

Louvered 18" x 18" vent
SECTION 08-7100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Hardware for wood doors.
B. Hardware for fire-rated doors.
C. Electrically operated and controlled hardware.
D. Thresholds.
E. Weatherstripping, seals and door gaskets.

1.02 RELATED REQUIREMENTS
A. Section 08-1416 - Flush Wood Doors.

1.03 REFERENCE STANDARDS
B. BHMA A156.1 - American National Standard for Butts and Hinges; 2013.
C. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; 2011.
D. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.
E. BHMA A156.6 - American National Standard for Architectural Door Trim; 2010.
F. BHMA A156.7 - American National Standard for Template Hinge Dimensions; 2014.
G. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2010.
I. BHMA A156.18 - American National Standard for Materials and Finishes; 2012.
L. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2014.
M. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames; 2006.
O. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors; 1993; also in WDHS-1/WDHS-5 Series, 1996.

1.04 ADMINISTRATIVE REQUIREMENTS
A. Coordinate the manufacture, fabrication, and installation of products that door hardware will be installed upon.

1.05 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings:
1. Indicate locations and mounting heights of each type of hardware, schedules, catalog cuts, electrical characteristics and connection requirements.
2. Submit manufacturer's parts lists and templates.

1.06 QUALITY ASSURANCE
A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING
A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

PART 2 PRODUCTS
2.01 MANUFACTURERS - BASIS OF DESIGN
A. As listed in Hardware Schedule.
B. Substitutions: See Section 01-6000 - Product Requirements.

2.02 DOOR HARDWARE - GENERAL
A. Provide hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
B. Provide items of a single type of the same model by the same manufacturer.
C. Provide products that comply with the following:
   1. Applicable provisions of federal, state, and local codes.
   3. Hardware on Fire-Rated Doors, Except Hinges: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
   4. Hardware for Smoke and Draft Control Doors: Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
   5. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified and indicated.
D. Electrically Operated and/or Controlled Hardware: Provide all power supplies, power transfer hinges, relays, and interfaces required for proper operation; provide wiring between hardware and control components and to building power connection.
E. Finishes: Provide door hardware of the same finish unless otherwise indicated.
   1. Finish: Satin chrome plated over nickel on brass or bronze, 626 (approx US26D).
      a. Location: Interior doors.
   2. Finish Definitions: BHMA A156.18.
F. Fasteners:
   2. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.03 LOCKS AND LATCHES
A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. If no hardware set is indicated for a swinging door provide an office lockset.
   2. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   3. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.
B. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.
   1. Provide cams and/or tailpieces as required for locking devices required.
C. Keying: Grand master keyed.
D. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.04 HINGES

A. Hinges: Provide hinges on every swinging door.
   1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
   2. Provide ball-bearing hinges at all doors.
   3. Provide hinges in the quantities indicated.
   4. Provide non-removable pins on exterior outswinging doors.
   5. Where electrified hardware is mounted in door leaf, provide power transfer as indicated.

B. Manufacturers - Hinges:
   5. Substitutions: See Section 01-6000 - Product Requirements.

2.05 PUSH/PULLS

A. Manufacturers - Push/Pulls:
   1. Assa Abloy McKinney or Ives.
   2. Substitutions: See Section 01-6000 - Product Requirements.

2.06 LOCKS AND LATCHES

A. Locks: Provide a lock for every door, unless specifically indicated as not requiring locking.
   1. Hardware Sets indicate locking functions required for each door.
   2. If no hardware set is indicated for a swinging door provide an office lockset.
   3. Trim: Provide lever handle or pull trim on outside of all locks unless specifically stated to have no outside trim.
   4. Lock Cylinders: Provide key access on outside of all locks unless specifically stated to have no locking or no outside trim.

B. Electrically Operated Locks: Fail secure unless otherwise indicated.

C. Lock Cylinders: Manufacturer’s standard tumbler type, six-pin standard core.
   1. Provide cams and/or tailpieces as required for locking devices required.

D. Keying: Grand master keyed.

E. Latches: Provide a latch for every door that is not required to lock, unless specifically indicated "push/pull" or "not required to latch".

2.07 CYLINDRICAL LOCKSETS

A. Locking Functions: As defined in BHMA A156.2, and as follows.
   1. Passage: No locking, always free entry and exit.
   2. Office: F81, key not required to lock, remains locked upon exit.
   3. Classroom: F84, key required to lock.
   4. Always-Locked - Storeroom: F86, key required to lock, may not be left unlocked.

B. Manufacturers - Cylindrical Locksets:

C. Lever - Schlage - Saturn style, lever with return.

2.08 EXIT DEVICES

A. Manufacturers - Exit Devices:
4. Substitutions: See Section 01-6000 - Product Requirements.

2.09 CLOSERS
A. Closers: Complying with BHMA A156.4.
   1. Provide surface-mounted, door-mounted closers unless otherwise indicated.
   2. Provide a door closer on every exterior door.
   3. Provide a door closer on every fire- and smoke-rated door. Spring hinges are not an acceptable self-closing device unless specifically so indicated.
   4. On pairs of swinging doors, if an overlapping astragal is present, provide coordinator to ensure the leaves close in proper order.
   5. At corridors, locate door-mounted closer on room side of door.
   6. At outswinging exterior doors, mount closer in inside of door.
B. Manufacturers - Surface Mounted Closers:
   2. LCN, an Allegion brand: www.allegion.com/us.
   3. Substitutions: See Section 01-6000 - Product Requirements.

2.10 STOPS AND HOLDERS
A. Stops: Complying with BHMA A156.8; provide a stop for every swinging door, unless otherwise indicated.
   1. Provide wall stops, unless otherwise indicated.
   2. If wall stops are not practical, due to configuration of room or furnishings, provide overhead stop.
   3. Stop is not required if positive stop feature is specified for door closer; positive stop feature of door closer is not an acceptable substitute for a stop unless specifically so stated.
B. Manufacturers - Wall and Floor Stops/Holders:
   2. Ives.
   3. Substitutions: See Section 01-6000 - Product Requirements.

2.11 GASKETING AND THRESHOLDS
A. Gaskets: Complying with BHMA A156.22.
   1. On each door in smoke partition, provide smoke gaskets; top, sides, and meeting stile of pairs. If fire/smoke partitions are not indicated on drawings, provide smoke gaskets on each door identified as a "smoke door" and 20-minute rated fire doors.
   2. On each exterior door, provide weatherstripping gaskets, unless otherwise indicated; top, sides, and meeting stiles of pairs.
      a. Where exterior door is also required to have fire or smoke rating, provide gaskets functioning as both smoke and weather seals.
   3. On each exterior door, provide door bottom sweep, unless otherwise indicated.
B. Thresholds: Complying with BHMA A156.21.
   1. At each exterior door, provide a threshold unless otherwise indicated.
C. Manufacturers - Gasketing and Thresholds:

2.12 PROTECTION PLATES AND ARCHITECTURAL TRIM
A. Manufacturers - Protection Plates and Architectural Trim:
   2. Ives.
   3. Substitutions: See Section 01-6000 - Product Requirements.
2.13 DOOR HINGE GUARD
   A. Manufacture: Fingersafe USA, Inc; P. O. Box 8777; Savannah, GA 31412. ASD. Phone: 912-234-6120. Fax: 912-236-7549. Web Site: www.fingersafe.com.
   B. Substitutions: See Section 01-6000 - Product Requirements.
   C. Description
      1. Open hinge protection, 48 inch high, or length of half high doors, PVC construction, allow free range of door motion, provide screws and fixing strips.
      2. Color: as selected from standard color chart.
      3. Model: MK1A for opening (push) side.

2.14 FINISHES
   A. Interior doors - #612 Brushed Brass. Match existing.
   B. All Exterior doors - #630 - Satin Stainless Steel.

2.15 KEYING
   A. Door Locks: Grand master keyed, verify requirements with Owner.
   B. Supply keys in the following quantities:
      1. 2 master keys.
      2. 5 grand master keys.
      3. 3 change keys for each lock.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.
   B. Verify that electric power is available to power operated devices and of the correct characteristics.

3.02 INSTALLATION
   A. Install hardware in accordance with manufacturer’s instructions and applicable codes.
   B. Use templates provided by hardware item manufacturer.
   C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
   D. Mounting heights for hardware from finished floor to center line of hardware item.
      1. For steel doors and frames: Comply with DHI (LOCS) "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames".
      2. For Wood Doors: Comply with DHI WDHS.3 "Recommended Locations for Architectural Hardware for Flush Wood Doors".
      3. Locksets: 38 inch.
      4. Push/Pulls: 42 inch.
      5. Dead Locks: 42 inch.
   E. Set exterior door thresholds with full-width bead of elastomeric sealant on each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.
      1. Coordinate theshold placement and floor installation to assure threshold overlaps flooring, for a tight, maintenance-free, easy to clean final product installation of flooring and doorway. Threshold to be placed over flooring.

3.03 ADJUSTING
   A. Adjust work under provisions of Section 01-7000 - Execution and Closeout Requirements.

3.04 HARDWARE SCHEDULE - ATTACHED AT END OF THIS SECTION.

END OF SECTION
# SECTION 08-7100
## DOOR HARDWARE SCHEDULE

### GROUP 1
DOOR 101, 103, 104, 105, 106, 107, 108, 109, 111, 114

<table>
<thead>
<tr>
<th>Item</th>
<th>Quantity</th>
<th>Description</th>
<th>Model</th>
<th>Manufacturer</th>
</tr>
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<tbody>
<tr>
<td>BUTTS BB1279 4 ½ X 4 ½</td>
<td>3</td>
<td>639</td>
<td>HAGER</td>
<td></td>
</tr>
<tr>
<td>CLASSROOM LOCK AL70PD SAT</td>
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<td>612</td>
<td>SCHLAGE</td>
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</tr>
<tr>
<td>CLOSER 5200 X 5957 CUSH STOP ARM</td>
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<td>BRZ</td>
<td>HAGER</td>
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</tr>
<tr>
<td>GASKET 735S</td>
<td>1 SET.</td>
<td>CH.</td>
<td>HAGER</td>
<td></td>
</tr>
<tr>
<td>ELECTRIC STRIKE BY OWNER @ 102B</td>
<td>1</td>
<td>VERIFY MFGR. AND MODEL #</td>
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### GROUP 2
DOOR 102A, 128 (EXISTING)

CARD READER BY OWNER WHERE NOTED

### GROUP 3
DOOR 102B, 110, 113A

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<th>Model</th>
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<td>PASSAGE LATCH AL10S SAT</td>
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<td>SCHLAGE</td>
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</tr>
<tr>
<td>CLOSER 5200</td>
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<td>BRZ</td>
<td>HAGER</td>
<td></td>
</tr>
<tr>
<td>WALLSTOP WS406/407CCV</td>
<td>1</td>
<td>612</td>
<td>IVES</td>
<td></td>
</tr>
<tr>
<td>GASKET 735S</td>
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<td>CH.</td>
<td>HAGER</td>
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<tr>
<td>ELECTRIC STRIKE BY OWNER @ 102B</td>
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### GROUP 4
DOOR 113B

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<tr>
<td>BUTTS BB1279 4 ½ X 4 ½</td>
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</tr>
<tr>
<td>PASSAGE LATCH AL10S SAT</td>
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<td>612</td>
<td>SCHLAGE</td>
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</tr>
<tr>
<td>CLOSER 5200</td>
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<td>BRZ</td>
<td>HAGER</td>
<td></td>
</tr>
<tr>
<td>WALLSTOP WS406/407CCV</td>
<td>1</td>
<td>612</td>
<td>IVES</td>
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DOOR 112

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<tr>
<td>STOREROOM LOCK AL80PD SAT</td>
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<td>SCHLAGE</td>
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</tr>
<tr>
<td>WALLSTOP WS406/407CCV</td>
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<td>612</td>
<td>IVES</td>
<td></td>
</tr>
<tr>
<td>GASKET 735S</td>
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### GROUP 6
DOOR 125

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<td>639</td>
<td>HAGER</td>
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<td>HAGER</td>
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<tr>
<td>WALLSTOP WS406/407CCV</td>
<td>1</td>
<td>612</td>
<td>IVES</td>
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</tr>
<tr>
<td>GASKET 735S</td>
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### GROUP 7
DOOR 115, 116, 117, 122

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<tr>
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<td>WALLSTOP WS406/407CCV</td>
<td>630</td>
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### GROUP 8
DOOR 119

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<th>Quantity</th>
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<th>Color</th>
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<td>BUTTS BB1279 4 ½ X 4 ½</td>
<td>639</td>
<td>HAGER</td>
</tr>
<tr>
<td>1</td>
<td>CLASSROOM LOCK AL70PD SAT</td>
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<td>SCHLAGE</td>
</tr>
<tr>
<td>1</td>
<td>CLOSER 5200</td>
<td>BRZ</td>
<td>HAGER</td>
</tr>
<tr>
<td>1</td>
<td>WALLSTOP WS406/407CCV</td>
<td>612</td>
<td>IVES</td>
</tr>
<tr>
<td>1 SET.</td>
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### GROUP 9
DOOR 120

<table>
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<tr>
<th>Quantity</th>
<th>Item Description</th>
<th>Color</th>
<th>Manufacturer</th>
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<td>PASSAGE LATCH AL105 SAT</td>
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<td>CLOSER 5200</td>
<td>BRZ</td>
<td>HAGER</td>
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<tr>
<td>1</td>
<td>WALLSTOP WS406/407CCV</td>
<td>612</td>
<td>IVES</td>
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END OF SECTION
SECTION 08-8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Glass.
B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS
A. Section 07-9005 - Joint Sealers: Sealant and back-up material.
B. Section 08-1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.
C. Section 08-1416 - Flush Wood Doors: Glazed lites in doors.
D. Section 08-4313 - Aluminum-Framed Storefronts: Glazing furnished by storefront manufacturer.
E. Section 08-5313 - Vinyl Windows: Glazing furnished by window manufacturer.
F. Section 10-2800 - Toilet, Bath, and Laundry Accessories: Mirrors.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

1.05 QUALITY ASSURANCE
A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.
B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

PART 2 PRODUCTS

2.01 INSULATING GLASS UNITS
A. Type IG-1 - Sealed Insulating Glass Units: Vision glass, double glazed. Energy Star V6 North-Central.
   1. Application: All exterior glazing on the north and east elevation.
   2. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
      b. Coating: Low-E2 (passive type), on #2 surface. SunCoat.
      c. U-value: 0.35 max.

3. Inboard Lite: Annealed float glass, 1/4 inch thick, minimum.
   a. Tint: Clear.

4. Total Thickness: 1 inch.
   a. Argon filled.
   b. 1/2 inch air space.

B. Type IG-2 - Sealed Insulating Glass Units: Vision glass, triple glazed.
   2. Outboard Lite: Annealed float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
      b. Coating: Low-E3 (passive type), on #2 surface. SunCoat MAX
      c. U-value: 0.35 max.
   3. Inboard Lite: Heat-strengthened float glass, 1/4 inch thick, minimum.
      a. Tint: Clear.
   4. Total Thickness: 1 inch.
   5. a. Argon filled.
   6. b. 1/2 air space.

2.02 GLAZING UNITS

A. Type E-1 - Single Exterior Vision Glazing:
   1. Type: Fully tempered float glass.
   2. Tint: Clear.
   3. Thickness: 1/4 inch.

B. Type S-1 - Single Vision Glazing:
   1. Application: All interior glazing unless otherwise indicated.
   2. Type: Fully tempered float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch.

C. Type S-2 - Fire-Protection-Rated Glazing:
   2. Safety Certification: 16 CFR 1201 Category II.
   3. Application: Provide this type of glazing in the following locations:
      a. Fire windows.
   4. Type: Laminated wired glass.
   5. Thickness: 1/4 inch.

D. Type S-3 - Single Safety Glazing: Non-fire-rated.
   1. Application: Provide this type of glazing in the following locations:
      a. Glazed lites in doors, except fire doors.
      b. Glazed sidelights to doors, except in fire-rated walls and partitions.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
   2. Type: Fully tempered float glass as specified.
   3. Tint: Clear.

2.03 EXTERIOR GLAZING ASSEMBLIES

A. Performance Criteria: Select type and thickness of glass to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
   2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
   3. Glass thicknesses listed are minimum.
2.04 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 Kind FT.
   B. Fire-Protection-Rated Glazing: Type, thickness, and configuration as required to achieve indicated ratings.
      1. IBC Fire Protection Rating: As indicated on drawings.
      2. Provide products listed by Underwriters Laboratories or Intertek Warnock Hersey.
      3. Labeling: Provide permanent label on each piece giving the IBC rating and other information required by the applicable code.

2.05 GLAZING COMPOUNDS
   A. Butyl Sealant: Single component; ASTM C920, Grade NS, Class 12-1/2, Uses M and A, Shore A hardness of 10 to 20; black color.

2.06 GLAZING ACCESSORIES
   A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness; ASTM C864 Option II.
      Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.
   B. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C864 Option I; verify color with Architect.
   C. Glazing Clips: See Drawings, stair details, for stair rail glazing clips.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that openings for glazing are correctly sized and within tolerance.
   B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION
   A. Clean contact surfaces with solvent and wipe dry.
   B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
   C. Prime surfaces scheduled to receive sealant.
   D. Install sealants in accordance with ASTM C1193 and GANA Sealant Manual.
   E. Install sealants in accordance with manufacturer's instructions.

3.03 FIELD QUALITY CONTROL
   A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.
   B. Monitor and report installation procedures and unacceptable conditions.

3.04 CLEANING
   A. Remove glazing materials from finish surfaces.
   B. Remove labels after Work is complete.
   C. Clean glass and adjacent surfaces.

3.05 PROTECTION
   A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

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Legend: Refer to Color Schedule for selected Brand/Colors

- AC: Adhesive Applied Acoustical Ceiling
- Tile: Tile
- CPT: Carpet
- (E): Existing
- FRP: Fiberglass Reinforced Plastic Panels
- LEP: Latex Enamel Paint
- LEP/P.LAM: Latex Enamel Paint above Plastic Laminate Wainscot
- LN: Linoleum
- LVT: Luxury Vinyl Tile
- P. LAM: Plastic Laminate
- RBR: Rubber base
- RF: Resilient Flooring
- SS: Solid Surface Countertop
- SAT: Suspended Acoustical Tile
- SGB: Suspended Gyp Bd.
- WD: Wood
- WDPL: Wood Paneling over gypsum board
- WD / RBR: Wood and 2 inch rubber base - see detail
SECTION 09-2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Gypsum wallboard.
B. Joint treatment and accessories.
C. Prime paint on walls and ceilings to receive textured finish.
D. Textured finish system.

1.02 RELATED REQUIREMENTS
A. Section 06-1000 - Rough Carpentry: Building framing and sheathing.
B. Section 06-1000 - Rough Carpentry: Wood blocking product and execution requirements.
C. Section 07-2100 - Thermal Insulation: Acoustic insulation.
D. Section 07-9005 - Joint Sealers: Acoustic sealant.

1.03 REFERENCE STANDARDS
D. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2014.

PART 2 PRODUCTS
2.01 GYPSUM BOARD ASSEMBLIES
A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 BOARD MATERIALS
A. Manufacturers - Gypsum-Based Board:
   4. Substitutions: See Section 01-6000 - Product Requirements.
B. 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. Thickness:
   3. Mold Resistant Paper Faced Products:
      a. CertainTeed Corporation; ProRoc Brand Moisture & Mold Resistant Gypsum Board.
C. Backing Board For Non-Wet Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
   1. Application: Vertical surfaces behind thinset tile, except in wet areas, and all areas behind sinks, lavatory sinks, mop sinks, etc.
   2. Type: Regular and Type X, in locations indicated.
   3. Type X Thickness: 5/8 inch.
5. Edges: Tapered.

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings, unless otherwise indicated.
   2. Thickness: 5/8 inch.

2.03 ACCESSORIES
A. Acoustic Insulation: As specified in Section 07-2100.
B. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
C. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.
D. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
F. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.
G. Adhesive for Attachment to Wood, ASTM C557 and Metal:
H. Acoustical Sound Board: Fibrous 1/2 inch thick board, installed behind gypsum board in sound rated walls as indicated in Drawings.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that project conditions are appropriate for work of this section to commence.

3.02 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.
B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. Seal around all penetrations by conduit, pipe, ducts, and rough-in boxes, except where firestopping is provided.

3.03 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. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.

3.04 INSTALLATION OF TRIM AND ACCESSORIES
A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
B. Corner Beads: Install at external corners, using longest practical lengths.
C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.05 JOINT TREATMENT
A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
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.
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.

3.06 TEXTURE FINISH
A. Prime paint prior on all walls and ceilings designated to receive spray textured finish.
B. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
C. Texture Required: Light orange peel texture.

3.07 TOLERANCES
A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
A. Suspended metal grid ceiling system.
B. Acoustical units.

1.02 RELATED REQUIREMENTS
A. Section 01-6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 28-4600 - Fire Detection and Alarm: Fire alarm components in ceiling system.
C. Section 21-1300 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
D. Section 15880 - Air Outlets and Inlets: Air diffusion devices in ceiling.
E. Section 16500 - Interior Lighting: Light fixtures in ceiling system.
F. Section 16820 - Paging System: Speakers in ceiling system.

1.03 REFERENCE STANDARDS
D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.
E. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

1.04 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.

1.05 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on suspension system components and acoustical units.

1.06 FIELD CONDITIONS
A. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS
A. Manufacturers:
   3. Or approved.
B. Acoustical Panels Type A: Painted mineral fiber, ASTM E1264 Type III, with the following characteristics:
   1. VOC Content: As specified in Section 01-6116.
   2. Size: 24 by 48 inches.
4. Light Reflectance: .87 percent, determined in accordance with ASTM E1264.
5. NRC Range: .80 to .80, determined in accordance with ASTM E1264.
7. Surface Pattern: Non-directional fissured.

C. Acoustical Panels Type B: Painted mineral fiber, ASTM E1264 Type IV, with the following characteristics:
1. VOC Content: As specified in Section 01-6116.
2. Size: 24 by 24 inches.
3. Thickness: 3/4 inches.
4. Light Reflectance: 90 percent, determined in accordance with ASTM E1264.
5. NRC Range: 0.75 determined in accordance with ASTM E1264.
6. Edge: Beveled Tegular 9/16”.

2.02 SUSPENSION SYSTEM
A. Manufacturers:
1. Same as for acoustical units.
B. 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.
C. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty.
1. Profile: Tee; 15/16 inch wide face.

2.03 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.
C. Seismic Restraint
1. Armstrong Seismic Rx Suspension System, ICC Report ESR-1308
2. BERC-2 clips required on two adjacent walls, with grid attached to wall perimeter molding on opposite walls.
3. BERC-2 clips attached to main grid beam and cross tees.
4. Install in strict accordance with manufacture requirements to meet seismic requirements.

PART 3 EXECUTION
3.01 INSTALLATION - SUSPENSION SYSTEM
A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
B. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.
C. 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.
D. 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.
E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
F. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
G. Do not eccentrically load system or induce rotation of runners.

H. 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.

I. Suspended ceiling system shall be braced for lateral loads. Contractor shall brace as follows or as required to meet ASTM C636 and as required to comply with Seismic Design Category D, per ASCE Standards.
   1. Contractor shall submit design calculations substantiating lateral restraint or shall install (4) no. 12 gauge wires to main runner within 2 inches of cross runner intersections and splayed out 90 degrees, at a maximum angle of 45 degrees. Lateral support wires to be spaced at 12'-0" maximum each way, 4'-0" maximum from wall. Attachment of the restraint wires to structure above shall be adequate for load imposed. Provide compression strut at each group of restraint wires.

3.02 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.

3.03 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION
SECTION 09-6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Resilient sheet flooring.
B. Resilient base.
C. Installation accessories.

1.02 RELATED REQUIREMENTS
A. Section 01-6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01-6000 - Product Requirements, for additional provisions.

1.05 FIELD CONDITIONS
A. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 SHEET FLOORING
A. Vinyl Sheet Flooring - Type A: Color and pattern throughout wear layer thickness, with backing.
   1. VOC Content Limits: As specified in Section 01-6116.
   2. Total Thickness: 0.08 inch minimum.
   3. Sheet Width: 144 inch minimum.
   4. Static Load Resistance: 125 psi minimum, when tested as specified in ASTM F970.
   5. Manufacturers:
      a. Mohawk, Collection - Serenity; Style Name - Ephemeral.
      b. Or approved. See Section 01-6000 - Product Requirements.

2.02 RESILIENT BASE
A. Resilient Base: ASTM F1861, Type TS rubber, vulcanized thermoset; top set Style B, Cove.
   1. Height: 4 inch. See Room Finish Schedule.
   2. Thickness: 0.125 inch.
   4. Color: Color as selected from manufacturer's full range.
   5. Manufacturers:
      d. Substitutions: see Section 01-6000 - Product Requirements.
2.03 ACCESSORIES
A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.
   1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.
C. Moldings, Transition and Edge Strips: Same material as flooring.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

3.02 PREPARATION
A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
B. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
C. Prohibit traffic until filler is fully cured.

3.03 INSTALLATION - GENERAL
A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install in accordance with manufacturer's written instructions.
C. Spread only enough adhesive to permit installation of materials before initial set.
D. Fit joints and butt seams tightly.
E. Set flooring in place, press with heavy roller to attain full adhesion.
F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.04 INSTALLATION - SHEET FLOORING
A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.
B. Seams are prohibited in bathrooms, kitchens, toilet rooms, and custodial closets.
C. Double cut sheet at seams.
D. Lay flooring with tightly butted seams, without any seam sealer unless otherwise indicated.
E. Finish seams in sheet vinyl Type 2 by heat welding.

3.05 INSTALLATION - RESILIENT BASE
A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
B. Miter internal corners. At exposed ends, use premolded units.
C. Install base on solid backing. Bond tightly to wall and floor surfaces.
3.06 CLEANING
   A. Remove excess adhesive from floor, base, and wall surfaces without damage.
   B. Clean in accordance with manufacturer's written instructions.

3.07 PROTECTION
   A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.08 SCHEDULE SEE ROOM FINISH SCHEDULE AT BEGINNING OF THIS DIVISION 9.

END OF SECTION
SECTION 09-6800
CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Carpet.
B. Accessories.

1.02 RELATED REQUIREMENTS
A. Section 01-6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 01-7419 - Construction Waste Management and Disposal: Reclamation/Recycling of new carpet scrap and new cushion scrap.
C. Section 09-0602 - Room Finish Materials.

1.03 REFERENCE STANDARDS
A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2011.
B. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute; 2009.

1.04 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate seaming plan, method of joining seams, direction of carpet pile and pattern, location of edge moldings and edge bindings.
C. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
D. Samples: Submit two samples 12 x 12 inch in size illustrating color and pattern for each carpet material specified.
E. Manufacturer's Installation Instructions: Indicate special procedures.
F. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.05 QUALITY ASSURANCE
A. Installer Qualifications: Company specializing in installing carpet with minimum three years documented experience.

1.06 FIELD CONDITIONS
A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS
A. Carpet:
   1. Lees-Mohawk Group
   2. Mannington Commercial:
   3. Substitutions: See Section 01-6000 - Product Requirements.

2.02 CARPET
A. Carpet Type CPT:
   1. Product: Modular Carpet Tile; Serenity Carpet, Manufactured by Mohawk Group.
   2. Tufted, Textured Patterned Loop, Modular Carpet Tile.
   3. Transformative Tile - GT 324.
   4. Flammability: ASTM E 648 Class 1 (Glue Down).
   5. Smoke Test: ASTM E 662 Less than 450.
   6. CRI Traffic: Heavy.
   7. Static: AATCC-134 Under 3.5 KV.
8. Color: As selected from manufacturers standard colors.
11. Pile Weight: 22.0 oz. per sq. yd.
12. Pile Thickness: .068”
13. Backing: EcoFlex ICT.
15. Stain Protection: Permanent, built into fiber.

2.03 ACCESSORIES
A. Sub-Floor Filler: Type recommended by carpet manufacturer.
B. Adhesives - General: Compatible with materials being adhered; maximum VOC content as specified in Section 01-6116.
C. Seam Adhesive: Recommended by manufacturer.
D. Contact Adhesive: Compatible with carpet material; releasable type.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive carpet.
B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive carpet.
C. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION
A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
D. Clean substrate.

3.03 INSTALLATION - GENERAL
A. Starting installation constitutes acceptance of sub-floor conditions.
B. Install carpet and cushion in accordance with manufacturer's instructions and CRI Carpet Installation Standard.
C. Install carpet in accordance with manufacturer's instructions and CRI 104.
D. Lay out carpet and locate seams in accordance with shop drawings:
   1. Locate seams in area of least traffic, out of areas of pivoting traffic, and parallel to main traffic.
   2. Do not locate seams perpendicular through door openings.
   3. Align run of pile in same direction as anticipated traffic and in same direction on adjacent pieces.
   4. Locate change of color or pattern between rooms under door centerline.
   5. Provide monolithic color, pattern, and texture match within any one area.
E. Install carpet tight and flat on subfloor, well fastened at edges, with a uniform appearance.

3.04 DIRECT-GLUED CARPET
A. Double cut carpet seams, with accurate pattern match. Make cuts straight, true, and unfrayed. Apply seam adhesive to cut edges of woven carpet immediately.
B. Apply contact adhesive to floor uniformly at rate recommended by manufacturer. After sufficient open time, press carpet into adhesive.

C. Apply seam adhesive to the base of the edge glued down. Lay adjoining piece with seam straight, not overlapped or peaked, and free of gaps.

D. Roll with appropriate roller for complete contact of adhesive to carpet backing.

E. Trim carpet neatly at walls and around interruptions.

3.05 CLEANING

A. Remove excess adhesive from floor and wall surfaces without damage.

B. Clean and vacuum carpet surfaces.

END OF SECTION
SECTION 09-9000
PAINTING AND COATING

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Surface preparation.
   B. Field application of paints, stains, varnishes, and other coatings.
   C. Scope: Finish all interior and exterior surfaces exposed to view, unless fully factory-finished and
      unless otherwise indicated, including the following:
      1. Mechanical and Electrical:
         a. In finished areas, paint all conduit, unless otherwise indicated.
         b. In finished areas, paint shop-primed items.
         c. On the roof and outdoors, paint all equipment that is exposed to weather or to view,
            including that which is factory-finished.
   D. Do Not Paint or Finish the Following Items:
      1. Items fully factory-finished unless specifically so 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. Floors, unless specifically so indicated.
      7. Acoustical materials, unless specifically so indicated.
      8. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

1.03 DEFINITIONS
   A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS
   A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for
      Architectural Coatings; U.S. Environmental Protection Agency; current edition.
   B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications;
      2014.
   C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and

1.05 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Provide data on all finishing products, including VOC content.
   C. Samples: Submit two paper chip samples, 8x8 inch in size illustrating range of colors and
      textures available for each surface finishing product scheduled.

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 and a maximum of 90
      degrees F, in ventilated area, and as required by manufacturer's instructions.
1.07 FIELD CONDITIONS
   A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
   B. Follow manufacturer’s recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
   C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS
   A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
   B. Paints:
      2. Sherwin-Williams.
   C. Transparent Finishes:
      1. Same as above.
   D. Stains:
      1. Same as above.
   E. Primer Sealers: Same manufacturer as top coats.
      1. Same as above.
   F. Substitutions: See Section 01-6000 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL
   A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
      1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
      2. Supply each coating material in quantity required to complete entire project’s work from a single production run.
      3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer’s product instructions.
   B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.
   C. Volatile Organic Compound (VOC) Content:
      1. Provide coatings that comply with the most stringent requirements specified in the following:
      2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.
   D. Colors: As indicated on drawings.
      1. In finished areas, finish pipes, ducts, conduit, and equipment the same color as the wall/ceiling they are mounted on/under.

2.03 PAINT SYSTEMS - EXTERIOR
   A. Paint WE-OP-3L - Wood, Opaque, Latex, 3 Coat - unfinished wood trim, soffits:
      1. One coat of latex primer sealer.
      2. Semi-gloss: Two coats of latex enamel; Moorcraft Super Spec Latex House & Trim No. 170, applied at dry film thickness of not less than 1.1 mils per coat.
B. Paint WE-OP-2L - Wood, Opaque, Latex, 2 Coat - Preprimed Siding & Trim:
    1. One coat of latex primer sealer - touch up as needed on bare surfaces, end cuts, etc.
    2. Semi-gloss: Two coats of latex enamel; Moorcraft Super Spec Latex House & Trim No. 170, applied at dry film thickness of not less than 1.1 mils per coat.
C. 1. One coat of Primer: Aqualock
    2. Two Coats of Stain: Benjamin Moore
       WB62330 Arborcoat (Teak)
       Match existing fiber cement, lap siding, parapet panels and battens color and finish.
D. Paint WE-TR-VS - Fiber Cement Siding, Semi-Transparent Stain:
    1. Two coats of stain; Moorwood Alkyd Semi-Transparent Deck & Siding Stain.
E. Paint ME-OP-3A - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
    1. One coat of alkyd primer.
    2. Semi-gloss: Two coats of alkyd enamel; Benjamin Moore Paints: IMC DTM Acrylic Semi-Gloss (M29). Applied at a dry film thickness of not less than 2.0 mils per coat.
F. Paint ME-OP-2A - Ferrous Metals, Primed, Alkyd, 2 Coat:
    1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.
    2. Semi-gloss: Two coats of alkyd enamel; Benjamin Moore Paints: IMC DTM Acrylic Semi-Gloss (M29). Applied at a dry film thickness of not less than 2.0 mils per coat.

204 PAINT SYSTEMS - INTERIOR
A. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
    1. One coat of latex primer sealer.
    2. Semi-gloss: Two coats of latex enamel; Benjamin Moore Paints; Moorcraft Super Spec Latex Semi-Gloss Enamel No. 276: Applied at a dry film thickness of not less than 1.2 mils per coat.
B. Paint WI-TR-VS - Wood, Transparent, Varnish, Stain:
    1. One coat of stain; Benjamin Moore Paints; Benwood Wood Finishes Penetrating Stain (234).
    2. One coat sealer.
    3. Gloss: Two coats of varnish; Benjamin Moore; Stays Clear Acrylic Polyurethane No. 423, Satin.
C. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
    1. One coat of latex primer.
D. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
    1. Touch-up with latex primer.
    2. Gloss: Two coats of latex enamel; Benjamin Moore Paints: IMC DTM Acrylic Semi-Gloss (M29). Applied at a dry film thickness of not less than 2.0 mils per coat.
E. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
    1. One coat of Moorcraft Super Spec Latex Enamel Undercoater & Primer Sealer No. 253: Applied at a dry film thickness of not less than 1.2 mils, primer sealer.
    2. Eggshell: Two coats of latex enamel; Moorcraft Super Spec Latex Eggshell Enamel No. 274: Applied at a dry film thickness of not less than 1.3 mils per coat.

205 ACCESSORY MATERIALS
A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.
B. Patching Material: Latex filler.
C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION
301 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 affect 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. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
   3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating 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 surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
D. Seal surfaces that might cause bleed through or staining of topcoat.
E. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
F. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
G. Uncorroded Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand or power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
H. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Re-prime entire shop-primed item.
I. Interior 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.
J. Interior 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.
K. 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.
L. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.
M. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
N. 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. 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.
C. Apply products in accordance with manufacturer's instructions.
D. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
E. Apply each coat to uniform appearance.
F. 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.

END OF SECTION
SECTION 10-2601
WALL AND CORNER GUARDS

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Corner guards.

1.02 SUBMITTALS
   A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
   B. Product Data: Indicate physical dimensions, features, anchorage details, and rough-in measurements.
   C. Samples: Submit two sections of corner guard, 24 inch long, illustrating component design, configuration, color and finish. Provide samples of manufacturers’ standard colors.
   D. Manufacturer's Instructions: Indicate special procedures, perimeter conditions requiring special attention.

PART 2 PRODUCTS
2.01 MANUFACTURERS
      2. C/S Acrovyn; Product SSM-20.

2.02 COMPONENTS
   A. Corner Guards - Surface Mounted:
      1. Performance: Resist lateral impact force of 100 lbs at any point without damage or permanent set.
      2. Width of Wings: 2 inches.
      3. Corner: Square.
      4. Color: As selected from manufacturer's standard colors.
      5. Length: One piece 48 inches.

2.03 FABRICATION

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.
   B. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION
   A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
   B. Position corner guard above wall base.

END OF SECTION
SECTION 10-2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1  GENERAL
1.01 SECTION INCLUDES
A. Commercial toilet accessories.
B. Accessories for toilet rooms and utility rooms.
C. Utility room accessories.
D. Grab bars.

PART 2  PRODUCTS
2.01 MANUFACTURERS
A. Toilet, Accessories:
   4. Bobrick, Inc: www. bobrick.com
   5. Substitutions: Section 01-6000 - Product Requirements.

2.02 FINISHES
A. Stainless Steel: Number 4 finish, unless otherwise noted.

2.03 COMMERCIAL TOILET ACCESSORIES
A. Toilet Paper Dispenser: Multi-roll, surface mounted bracket type, stainless steel, spindleless type for tension spring delivery designed to prevent theft of tissue roll.
   1. Product: B-4288 Contura manufactured by Bobrick.
D. Seat Cover Dispenser: Stainless steel, surface-mounted.
   1. Product: B-4221 Contura series manufactured by Bobrick.
E. Grab Bars: Stainless steel, 1-1/4 inches outside diameter, minimum 0.05 inch wall thickness, nonslip grasping surface finish, concealed flange mounting; 1-1/2 inches clearance between wall and inside of grab bar.
   1. Length: 42, 36, and 18 inches.
F. Mirrors: Stainless steel framed, 6mm thick float glass mirror.
   1. Sizes: As indicated on interior elevations. See elevations for locations.

2.04 UTILITY ROOM ACCESSORIES
A. Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, hat-shaped channel.
   2. Length: 36 inches.

PART 3  EXECUTION
3.01 EXAMINATION
A. Verify existing conditions before starting work.
B. Verify exact location of accessories for installation.
C. Verify that field measurements are as indicated on drawings.
D. See Section 06-1000 for installation of blocking in walls.
3.02 PREPARATION
   A. Deliver inserts and rough-in frames to site for timely installation.
   B. Provide templates and rough-in measurements as required.
   C. Provide blocking as required.

3.03 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.
   D. Mounting Heights and Locations: As required by accessibility regulations and as indicated on drawings

END OF SECTION
SECTION 10-5100
LOCKERS

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Locker units with hinged doors.

1.02 RELATED REQUIREMENTS
A. Section 06-1000 - Rough Carpentry: Wood blocking and nailers.

1.03 SUBMITTALS
A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Product Data: Manufacturer's published data on locker construction, sizes and accessories.
C. Shop Drawings: Indicate locker plan layout, numbering plan.
D. Samples: Submit two samples 1" by 2" inches in size minimum, of manufacturer's standard colors.
E. Manufacturer's Installation Instructions: Indicate component installation assembly.

1.04 DELIVERY, STORAGE, AND HANDLING
A. Protect locker finish and adjacent surfaces from damage.

PART 2 PRODUCTS
2.01 MANUFACTURERS
A. Metal Lockers:
   1. Salisbury Industries: www.salsburyindustries.com
   2. Model: #34365
   3. Side Panel: #33330
   4. Substitutions: See Section 01-6000 - Product Requirements.

2.02 LOCKER APPLICATIONS
2.03 MATERIALS
A. Industrial grade particle board covered with high pressure laminate.
B. Accessories For Each Locker: Two single prong wall hooks, hat shelf.

2.04 LOCKER UNITS
A. Width: 12 inches (36" overall).
B. Depth: 15 inches.
C. Height: 72 inches.
D. Configuration: Four tier.
E. Base: Black laminated particle board.
   1. Base Height: 4 inch.
F. Top: Flat.
G. Locking: Equipped for combination locks.
H. Locking device supplied by Owner.

2.05 FINISH
A. Architect to select from manufacturer's standard colors.

PART 3 EXECUTION
3.01 EXAMINATION
A. Verify that prepared bases are in correct position and configuration.
B. Verify bases and embedded anchors are properly sized.
3.02 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Install lockers plumb and square.
   C. Place and secure on prepared base.
   D. Secure lockers with anchor devices to suit substrate materials. Minimum Pullout Force: 100 lb.
   E. Bolt adjoining locker units together to provide rigid installation.
   F. Install end panels and filler panels.
   G. Install accessories.
   H. Replace components that do not operate smoothly.

3.03 CLEANING
   A. Clean locker interiors and exterior surfaces.

END OF SECTION
SECTION 22 0500
COMMON PLUMBING MATERIALS AND METHODS

PART 1  GENERAL

1.01 DESCRIPTION

A. The provisions of the General Requirements, Supplementary Requirements, and Division 1 apply to the plumbing work specified in this Division.

B. The requirements of this Section apply to the plumbing systems specified in these Specifications and in other Division 22 sections.

C. Provide all items, articles, materials, equipment, operations and/or methods listed, mentioned, shown and/or scheduled on the Drawings and/or in these Specifications, including all labor, supervision, services, permits, fees, and incidentals necessary and required to provide a complete and operable facility with complete systems as shown, specified, and required by applicable codes.

D. The work shall include, but not be limited to, the following systems:
   1. Service and distribution piping including valves, supports, insulation, etc.
   2. Complete plumbing systems, including fixtures, trim, equipment, etc.
   3. Rough-in and final connection of plumbing equipment and fixtures furnished under other Divisions of this Specification.

E. Advise subcontractor, suppliers, and vendors involved in the work specified in this Section of the applicable requirements.

1.02 QUALITY ASSURANCE

A. All work and materials shall conform to all applicable local and state codes and all federal, state and other applicable laws and regulations. All clarifications and modifications which have been cleared with appropriate authorities are listed under the applicable sections. All electrical products shall bear the label of a recognized testing laboratory such as UL or CSA.

B. Whenever the requirements of the Specifications or Drawings exceed those of the applicable code or standard, the requirements of the Specifications and Drawings shall govern.

C. Codes and Standards: Comply with the provisions of the following referenced codes, standards and specifications:
   1. Federal Specifications (FS)
   2. American National Standards Institute (ANSI)
   3. National Electrical Manufacturer's Association (NEMA)
   4. National Fire Protection Association (NFPA)
   5. Underwriters Laboratories, Inc. (UL)
   6. Factory Mutual (FM)
   7. International Building Code (IBC) with State and Local Amendments
   8. International Mechanical Code (IMC) with State and Local Amendments
   9. Uniform Plumbing Code (UPC) with State and Local Amendments
   10. American Society for Testing and Materials (ASTM)
   11. Americans with Disabilities Act (ADA)
   12. International Fire Code (IFC) with State and Local Amendments
   14. Manufacturers Standardization Society (MSS)
   15. National Sanitation Foundation (NSF)
   16. American Gas Association (AGA)
D. Each piece of equipment furnished shall meet all detailed requirements of the Drawings and Specifications and shall be suitable for the installation shown. Equipment not meeting all requirements will not be acceptable, even though specified by name. Where two or more units of the same class of equipment are furnished, use product of the same manufacturer; component parts of the entire system need not be products of same manufacturer. Furnish all materials and equipment, new and free from defect and of size, make, type and quality herein specified or approved by the Architect. All materials shall be installed in a neat and professional manner.

E. All apparatus shall be built and installed to deliver its full rated capacity at the efficiency for which it was designed.

F. The Drawings and Specifications are complementary. What is called for by one shall be as though called for by both.

G. Drawings: Do not reference or scale drawings for roughing-in measurements, nor use as shop drawings. Make field measurements and prepare shop drawings as required. Verify all dimensions with dimensioned architectural drawings. Coordinate work with shop drawings of other specification divisions.

H. Field Wiring: It is the intent of these specifications that all systems shall be complete and operable. Refer to all drawings and specifications, especially the electrical drawings, to determine voltage, phase, circuit ampacity and number of connections provided. Provide all necessary field wiring and devices from the point of connection indicated on the electrical drawings. All equipment shall be installed in compliance with the Electrical Code and the equipment’s UL listing. Bring to the attention of the Architect in writing, all conflicts, incompatibilities, and/or discrepancies prior to bid or as soon as discovered.

1.03 WORK OF OTHER CONTRACTS

A. Work under this contract shall be conducted in a manner to allow for the future installations of such equipment or items listed in other sections of this Specification.

1.04 WORK OF OTHER DIVISIONS

A. Work under this Division shall be conducted in a manner to cooperate with the installation of such equipment or items as specified in other Divisions.

B. HVAC piping systems, fuel piping systems, fire suppression piping systems, and control devices and control wiring relating to the heating and air conditioning systems are specified under other Divisions of these Specifications except for provisions or items specifically noted on the Drawings or specified herein.

C. Consult all Drawings and Specifications in this project and become familiar with all equipment to be installed. Coordinate all aspects of the construction with the other trades on the job to ensure that all work and materials required to provide a complete and operational facility are included in the bid.

D. All sections of Division 22 are interrelated and shall be considered in their entirety when interpreting any material, method, or direction listed in any section of Division 22. Individual sections are not written for specific subcontractors or suppliers but for the general contractor.

1.05 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES (SUBMITTALS)

A. Submit in accordance with Division 1 full technical and descriptive shop drawing data on proposed materials and equipment as detailed in each section.

B. The Contractor shall verify that all equipment submitted can be delivered and installed within the time constraints of the construction period.
C. Include the manufacturer, type, style, catalog number, complete specification, certified dimensions, provided options or accessories, and description of physical appearance for each item and option submitted. Reproduction of catalog data sheets shall be clean and legible to show all details, including gauge of metal used.

D. Include only information on exact equipment to be installed, not general catalogs of the manufacturer. Where sheets show proposed equipment as well as other equipment, identify proposed equipment with arrow or similar concise method. Product data not indicating specific product and included options may be rejected.

E. Submit with each copy a transmittal letter verifying that all included equipment submittals have been carefully considered for quality, dimensions, function, and have been coordinated with the Drawings and Specifications. Guarantee that proposed materials will meet or exceed the quality and function of those specified.

F. Include field wiring diagrams and connection diagrams for all control and/or low voltage systems, including floor plans.

G. Submittal Review: The submittal review process is a means to provide quality control. The action noted to be taken (or where conflicts with the contract documents are not noted) shall not be interpreted by the Contractor as automatic "change orders." Approval of the data for substitution and shop drawings shall not eliminate the contractor’s responsibility for compliance with Drawings or Specifications, nor shall it eliminate the responsibility for freedom from errors of any sort in the data discovered prior to or after the review process. Deviations, discrepancies, and conflicts between the submittals and the Contract Documents shall be called to the Architect's attention in writing at the time of transmittal of the data.

1.06 PRODUCT SUBSTITUTION

A. Materials other than those specified may be approved for this project providing a written request is submitted to the Architect prior to bid in accordance with Instructions to Bidders. Requests shall include complete specifications, dimensions, manufacturer and catalog number for each item for which approval is desired. If, in the opinion of the Architect, the material is not complete or if it is not an acceptable substitute, he may reject it. The Architect's evaluation will be based solely on the material submitted.

1.07 CHANGE ORDERS

A. All supplemental cost proposals by the Contractor shall be accompanied by a complete itemized breakdown of labor and materials without exception. At the Architect's request, the contractor's estimating sheets for the supplemental cost proposals shall be made available to the Architect. Labor must be separated and allocated for each item of work.

1.08 RECORD DOCUMENTS

A. Project Record (As-Installed) Drawings:
   1. Maintain a set of record drawings on the job site as directed in Division 1.
   2. Keep Drawings clean, undamaged, and up to date.
   3. Record and accurately indicate the following:
      a. Depths, sizes, and locations of all buried and concealed piping and all cleanouts, whether concealed or exposed, dimensioned from permanent building features.
      b. Locations of all valves with assigned tag numbers.
      c. Changes, additions, and revisions due to change orders, obstructions, etc.
      d. Eradicate extraneous information.
      e. Locations of tracer wire terminal points.
      f. Model numbers of installed equipment.
   4. Make Drawings available when requested by Architect for review.
   5. Submit as part of the required Project Closeout documents.
B. Operating and Maintenance Manuals: Submit three (3) sets of Operating and Maintenance Instructions, including manufacturer’s service data, wiring diagrams, and parts lists and vendors for all serviceable items of equipment, valve charts, balancing data, final control diagrams showing final set points, and any additional equipment added by change order. Unless otherwise directed, information shall be bound in three-ring, vinyl covered, loose-leaf binders organized with index and thumb-tab markers for each classification of equipment or data.

1.09 WARRANTY

A. Furnish, prior to application for final payment, three copies of written and signed guarantee effective a period of one year from date of completion and acceptance of entire project; agree to correct, repair and/or replace defective materials and/or equipment or the results of defective workmanship without additional expense to the Owner. Where no response satisfactory to the Owner has occurred within three working days from the written report of a warranty covered defect, the contractor shall agree to pay for the cost of repair of the reported defect by a contractor of the Owner’s choice.

B. Where the manufacturer's guarantee exceeds one year, the longer guarantee shall govern and include the Contractor's labor.

PART 2 PRODUCTS

2.01 GENERAL

A. General: Provide all new materials and equipment, identical to apparatus or equipment in successful operation for a minimum of two years. Provide materials of comparable quality omitted here but necessary to complete the work. Maximum allowable variation from stated capacities, minus 5% to plus 10% as approved in each case.

B. Compatibility: Provide products which are compatible with other portions of the work and provide products with the proper or correct power and fuel-burning characteristics, and similar adaptations for the project.

C. Efficiency: Service (Domestic) Water Heating Equipment shall comply with ASHRAE Standard 90.1-2001 and the State Energy code. Where equipment efficiencies are indicated, the use of alternate or substitute manufacturer’s equipment with lower efficiencies is not permitted.

D. Potable water components: Potable water piping, fittings, and valves not limited to faucets, mixing valves, or pressure reducing valves shall not exceed state or federal standards for lead content and shall be certified under NSF/ANSI 61.

E. Storage and Handling:
   1. Delivery: Deliver to project site with manufacturer’s labels intact and legible.
   2. Handling: Avoid damage.
   3. Storage: Inside protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

2.02 VALVES

A. General: Provide factory fabricated valves of the type, body material, temperature and pressure class, and service indicated. Bronze gate, globe and check valves shall comply with MSS-SP-80. Ball valves shall comply with MSS-SP-110. Iron gate and globe valves shall comply with MSS-SP-70. Iron check valves shall comply with MSS-SP-71. Butterfly valves shall comply with MSS-SP-67. Valve size same as connecting pipe size.

B. Acceptable Manufacturers: Milwaukee, Crane, Grinnell, Nibco, Hammond, Stockham, Legend, Watts, Apollo, Webstone, and Walworth. Grooved end valves Victaulic, Tyco-Grinnell, Gruvlock, or accepted substitute. NIBCO numbers are given except as noted. Where possible, provide valves from a single manufacturer.

C. Valve styles: Domestic hot and cold water.
   1. Valves 2” and Smaller:
a. Ball: Two-piece, bronze body, full port, 600 psi WOG, Fig. T/S-585-70.
b. Check: Bronze body, swing check, 200 psi WOG, T/S-413B (bronze disc) or T/S-413Y (Teflon disc).
c. Globe (shutoff): Bronze body, Teflon disc, 200 psi WOG, T/S-211Y.
d. Globe (throttling): Bronze body, full stainless steel plug disc, 600 psi WOG, T-276AP.

D. Selection of Valve Ends (Pipe Connections): Select and install valves with ends matching the types of pipe/tube connections.

2.03 HANGERS AND SUPPORTS

A. General: Provide factory-fabricated horizontal piping hangers, clamps, hanger rod, inserts, supports, etc., of the indicated MSS type and size. The Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry Practice SP-58 and SP-69 are referenced in this section.

B. Manufacturers: B-Line, Grinnell, Anvil, Superstrut, Tolco, Erico, or accepted substitute. Grinnell figure numbers in parentheses where applicable (or other manufacturers as noted).

C. Corrosion Protection: Provide materials which are zinc plated or factory painted to prevent corrosion. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated, plastic coated, or by other recognized industry methods.

D. Horizontal Piping Hangers and Supports:
   1. Adjustable Clevis Hanger: MSS Type 1 (Fig. 260).
   2. Adjustable Band Hanger: MSS Type 7 (Fig. 97), fabricated from steel.
   3. Adjustable Swivel-Band Hanger: MSS Type 10 (Fig. 70).
   4. Clamp: MSS Type 4 (Fig. 212, 216).
   5. Double-Bolt Clamp: MSS Type 3 (Fig. 295A, 295H), including pipe spacers.

E. Vertical Pipe Clamps:
   1. Two-Bolt Riser Clamp: MSS Type 8 (Fig. 261).
   2. Four-Bolt Riser Clamp: MSS Type 42 include pipe spacers at inner bolt-holes.

F. Hanger Attachment:
   2. Turnbuckles: MSS Type 13 (Fig. 230).
   3. Weldless Eye-Nut: MSS Type 17 (Fig. 290).
   4. Malleable Eye-Socket: MSS Type 16 (Fig. 110R).
   5. Clevises: MSS Type 14 (Fig. 299).

2.04 IDENTIFICATION MARKERS

A. Pipe Markers:
   2. Acceptable Manufacturers: Brady B946 with arrow banding tape or similar Seaton, Zeston, MSI.

PART 3   EXECUTION

3.01 LAYOUT AND COORDINATION

A. Site Examination: Before starting work, carefully examine site and all contract Drawings. Become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, roughing-in dimensions and equipment locations before proceeding with any of the work.

B. Utility Locations: The location of existing utilities, wires, conduits, pipes, ducts, or other service facilities are shown in a general way only on the Drawings and are taken from existing records. Ascertain whether any additional facilities other than those shown on the plans may be present and determine the exact location and elevations of all utilities prior to commencing installation.
C. Sleeves, Inserts, Cast-in-Place Work: Provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.

D. Coordination:
1. The drawings are based on equipment of a certain manufacturer and may be identified as such. Where alternate manufacturers or approved substitutes are incorporated into the work, any required design changes are the responsibility of the contractor. Such changes may include changes in utility or system connection sizes, location, or orientation, service clearances, structural support or acoustic considerations.
2. Where the work must be sequenced and positioned with precision in order to fit into the available space, prepare accurate scale shop drawings showing the actual physical dimensions required for the installation and submit prior to purchase/fabrication/installation of any of the elements involved in the coordination.
3. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.
4. Coordinate all work with other trades and determine in advance where interfacing of the mechanical work and other work are required to be connected together. Provide all materials and equipment to make those connections. Submit shop drawings showing required connections where special conditions exist.

E. Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions. Do not proceed with any questionable items of work until clarification of same has been made. Should rearrangement or re-routing of piping be necessary, provide for approval the simplest layout possible for that particular portion of the work.

3.02 CONTINUITY OF EXISTING SERVICES

A. Existing water, power, heat, ventilation, air conditioning and other services shall remain in service during new construction work. Coordinate any interruption of these services with the Owner's representative a minimum of twenty-four (24) hours in advance. Arrange work to minimize number and extent of all interruptions.

B. Protect from damage active utilities existing and evident by reasonable inspection of the site whether shown or not on the Drawings. Protect, relocate or abandon utilities encountered in the work which are not shown on the Drawings or evident by inspection of the work as directed by the Architect. Maintain continuity of all utility services to existing buildings.

3.03 EQUIPMENT REMOVAL

A. All removed mechanical equipment is the property of the Contractor unless indicated otherwise. Disconnect and remove all such equipment from the project property. Cap all piping in walls, below floors, and/or above ceilings in finished rooms.

B. Reused Equipment: Reconnect piping, wiring and/or controls to restore original equipment functions unless indicated otherwise.

3.04 MECHANICAL EQUIPMENT WIRING

A. Provide all mechanical equipment motors, automatic temperature, limit, float and similar control devices required, with wiring complete from power source indicated on Electrical Drawings.

B. Provide properly rated motor overload and undervoltage protection and all manual or automatic motor operating devices for all mechanical equipment.

C. Equipment and systems shown on the Drawings and/or specified, are based upon requirements of specific manufacturers which are intended as somewhat typical of several makes which may be approved. Provide all field wiring and/or devices necessary for a complete and operable system including controls for the actual selected equipment/system.
3.05 GENERAL INSTALLATION

A. Locating and Positioning Equipment: Observe all Codes, Regulations and good common practice in locating and installing mechanical equipment and material so that completed installation presents the least possible hazard. Maintain adequate clearances for repair and service to all equipment and comply with Code requirements.

B. Arrangement: Arrange piping parallel with primary lines of the building construction, and with a minimum of 7’ overhead clearance in all areas where possible. Unless indicated otherwise, conceal all piping. Locate operating and control equipment properly to provide easy access, and arrange entire mechanical work with adequate access for operation and maintenance. Give right-of-way to piping which must slope for drainage. Set all equipment level or as recommended by manufacturer. Under no conditions shall beams, girders, footings or columns be cut for mechanical items. Casting of pipes into concrete is prohibited unless so shown on Drawings.

C. Access Panels: Provide access panels with proper backing reinforcement for all equipment, dielectric unions, valves and items requiring service and installed above ceilings, behind walls, or in furring, complete with correct frame for type of building construction involved. Exact size, number and location of access panels are not necessarily shown on Drawings. Use no panel smaller than 12” by 12” for simple manual access or smaller than 16” x 20” where personnel must pass through.

D. Adjusting: Adjust and calibrate all automatic mechanical equipment, mixing valves, flush valves, float devices, etc. Adjust flow rates at each piece of equipment or fixture.

E. Building Vapor Barrier: Wherever the building insulation vapor barrier is penetrated by piping, hangers, conduits, etc., provide clear self-adhesive tape recommended by the insulation manufacturer around the penetrations.

3.06 VALVE INSTALLATION

A. General: Comply with the following requirements:

1. Install valves where required for proper operation of piping and isolation of equipment, including valves in branch lines to isolate sections of piping, and where shown on the drawings. Install valves at low points in piping systems that must be drained for service or freeze protection.

2. Locate valves in accessible spaces (or behind access panels) and so that separate support can be provided when necessary.

3. Install valves with stems pointed up, in the vertical position where possible, but in no case with stems pointed downward from a horizontal plane.

B. Insulated Valves: Install extended-stem valves in all piping specified as insulated, and arrange in the proper manner to receive insulation.

C. Valve Access: Provide access panels to all valves installed behind walls, in furring or otherwise inaccessible.

3.07 INSTALLATION OF HANGERS AND SUPPORTS

A. General: Proceed with the installation of hangers, supports and anchors only after the required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) the proper placement of inserts, anchors and other building structural attachments.

1. Install hangers, supports, clamps, and attachments to support piping and equipment properly from the building structure. Use no wire or perforated metal to support piping, and no supports from other piping or equipment. For exposed continuous pipe runs, install hangers and supports of the same type and style as installed for adjacent similar piping.

2. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated or by other recognized industry methods.


4. Arrange supports to prevent eccentric loading of joists and joist girders. Locate supports at panel points only. Do not drill beam or joist flanges for hanger attachment.
B. Provisions for Movement:
1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate the action of expansion joints, expansion loops, expansion bends and similar units. Install specified seismic restraints to restrict excessive movement.
2. Install hangers and supports so that equipment and piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
3. Install hangers and supports to provide the indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded. Comply with the following installation requirements:
   a. Clamps: Attach clamps, including spacers (if any), to piping outside the insulated piping support. Do not exceed pipe stresses allowed by ANSI B31.
   b. Insulated Pipe Supports: Insulated pipe supports shall be supplied and installed on all insulated pipe and tubing.
   c. Load Rating: All insulated pipe supports shall be load rated by the manufacturer based upon testing and analysis in conformance with ASME B31.1, MSS SP-58, MSS SP-69 and MSS SP-89.
   d. Support Type: Manufacturer's recommendations, hanger style and load shall determine support type.
   e. Insulated Piping Supports: Where insulated piping with continuous vapor barrier or where exposed to view in finished areas is specified, install hard maple wood insulation shields (Elcen Fig. 216) or steel pipe covering protection shields (MSS type 39) at each hanger.

C. Pipe Support:
1. Vertical Spacing: Support at base, at equivalent of every floor height (maximum 10' as required by Code) and just below roof line.
2. Screwed or Welded Steel or Copper Piping: Maximum hanger spacing shall be as follows:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Steel Span</th>
<th>Copper Span</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/4&quot; and smaller</td>
<td>7' span</td>
<td>6' span</td>
</tr>
<tr>
<td>1-1/2&quot; pipe</td>
<td>9' span</td>
<td>6' span</td>
</tr>
<tr>
<td>2&quot; pipe</td>
<td>10' span</td>
<td>10' span</td>
</tr>
<tr>
<td>2-1/2&quot; &amp; larger</td>
<td>12' span</td>
<td>10' span</td>
</tr>
</tbody>
</table>

3. PVC, ABS, Polypropylene and Other Plastic Pipe: Maximum hanger spacing and minimum rod diameters as follows:
   a. Continuous support 1/2" to 4" pipe size Fee & Mason No. 109 channels with Fee & Mason No. 108 hanger. Lay pipe directly into the channel with fittings or couplings placed in spaces between channel sections. Secure piping to the channel at intervals between hangers with a few turns of vinyl electrical tape.
   b. Non-Continuous Support: Maximum 4' spans or shorter if required by manufacturer for temperatures and pipe schedule.
   c. Arrange supports to allow free movement, but restrict upward movement of lateral runs so as not to create reverse grade on drainage pipe. Use double bolt clamp or band hanger with restraint (Tolco fig. 25).
4. Install additional hangers or supports at concentrated loads such as pumps, valves, etc. to maintain alignment and prevent sagging.
5. Support Rod: Hanger support rods sized as follows:

<table>
<thead>
<tr>
<th>Pipe and Tube Size</th>
<th>Rod Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches mm</td>
<td>Inches mm</td>
</tr>
<tr>
<td>1/2&quot; to 4&quot;</td>
<td>12.7 to 101.6</td>
</tr>
<tr>
<td>5&quot; to 8&quot;</td>
<td>127.0 to 203.2</td>
</tr>
<tr>
<td>10&quot; to 12&quot;</td>
<td>254.0 to 304.8</td>
</tr>
</tbody>
</table>

D. Adjust hangers and supports to bring piping to proper levels and elevations.

E. Provide all necessary structural attachments such as anchors, beam clamps, hanger flanges and brackets in accordance with MSS SP-69. Attachments to beams wherever possible. Supports suspended from other piping, equipment, metal decking, etc., are not acceptable.
F. Horizontal banks of piping may be supported on common steel channel member spaced not more than the shortest allowable span required on the individual pipe. Maintain piping at its relative lateral position using clamps or clips. Allow lines subject to thermal expansion to roll axially or slide. Size channel struts for piping weights.

G. Installation of drilled-in concrete anchors shall comply with the manufacturers instructions for working load, depth of embedment, and spacing between anchors and from the edge of the slab. Use only wedge style anchors.

3.08 PLUMBING SYSTEM IDENTIFICATION

A. Piping System: Indicate each pipe system by its generic name (abbreviated) as shown/scheduled/specified; except vent and drainage piping. Comply with ANSI A13.1 for marker locations, letter sizes, and colors. Include arrows to show direction of flow and “Electric Traced” signs to identify heat cable wrapped piping. Locate pipe labels in accessible areas as follows:
   1. Near each valve, meter, gauge, or control device.
   2. Near equipment such as pumps, heat exchangers, water heaters, etc.
   3. At piping branch connections.
   4. At penetrations (each side) of walls, ceilings, and floors.
   5. At access panels and doors.
   6. At 25 foot maximum intervals. Provide a minimum of 1 label above each room where lift out ceiling is installed. Reduce intervals in congested areas such as mechanical rooms.

3.09 EQUIPMENT CONNECTIONS

A. Provide complete plumbing connections for all items of equipment requiring such connections, including incidental piping, fittings, trim and labor necessary for a finished working installation.

B. Verify the rough-in and finish requirements for all equipment provided under other Divisions of the work and requiring plumbing connections with equipment supplier and installer prior to rough-in. Minimum branch pipe size for fixtures shall be 1/2".

3.10 PROTECTION

A. Protect all work and materials against loss or damage. Close all pipe openings with caps or plugs. At final completion, thoroughly clean and deliver all work and equipment in an unblemished new condition. Keep all motors and bearings in watertight and dustproof covers during entire course of installation.

3.11 CUTTING AND PATCHING

A. General: Comply with the requirements of Division 1 for the cutting and patching of other work to accommodate the installation of mechanical work. Do all necessary cutting and patching of existing building and yard surfaces required for completion of the mechanical work. Patch to match finish and color of adjacent surfaces.

3.12 PLUMBING WORK CLOSEOUT

A. General: Refer to the Division 1 sections for general closeout requirements. Calibrate all equipment requiring same. Complete each system as shown or specified herein and place in operation except where only roughing-in or partial systems are called for. Each system shall be tested and left in proper operation free of leaks, obstructions, or contamination.

B. Record Drawings: Submit record set of drawings as previously specified in this Section.

C. Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Adjust and correct operations as required for proper performance. Clean and lubricate each system, and replace dirty filters, and similar expendable items of the work.
D. Operating Instructions: Conduct a walk-through instruction seminar for the Owner's personnel who are to be involved in the continued operation and maintenance of plumbing equipment and systems. Provide written instructions outlining and explaining the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the systems.

END OF SECTION
SECTION 22 0700
PLUMBING INSULATION

PART 1  GENERAL

1.01 DESCRIPTION
A. The requirements of this section apply to the insulation of plumbing systems specified elsewhere in these specifications.
B. The requirements of Section 22 0500, Common Plumbing Materials and Methods, also apply to this section.

1.02 QUALITY ASSURANCE
A. Minimum Insulation Thickness and Thermal Performance: Comply with the State of Oregon Energy Efficiency Code except where more stringent requirements are specified herein.
B. Composite (Insulation, Jacket or Facing and Adhesives) Fire and Smoke Hazard Ratings: Not to exceed a flame spread of 25 or smoke development of 50 and containing less than 0.1% by weight deca-PDE fire retardant.
C. Component Ratings of Accessories (Adhesives, Mastics, Cements, Tapes, Finishing Cloth for Fittings): Same as "B" requirements above and permanently treated. No water soluble treatments.

1.03 SUBMITTALS
A. Submit catalog data and performance characteristics for each product specified.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING
A. General: In addition to the requirements specified in Section 22 0500, the following apply:
1. Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products. Store insulation in original wrappings and protect from weather and construction traffic.
2. Protect insulation against dirt, water, chemical and mechanical damage. Do not install damaged insulation. Remove such insulation from project site.

PART 2  PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS
A. Insulation Manufacturers: Johns Manville, Owens-Corning, Knauf, Certain Teed, Armstrong, Pabco, Imcoa or Nomaco. Johns Manville products are listed unless indicated otherwise.
B. Adhesive Manufacturers: Foster, 3M, Insul-Coustic, Borden, Kingco or Armstrong.

2.02 PIPING INSULATION
A. Interior and Exterior Piping Systems 32 to 180 Deg. F: Glass fiber preformed pipe insulation with a minimum K-value of 0.23 at 75 deg. F, a minimum density of 3.5 pounds per cubic foot within all-service vapor barrier jacket, vinyl or pre-sized finish and pressure sensitive seal containing less than 0.1% by weight deca-PDE fire retardant.
B. Pipe Temperatures Minus 30 to 180 Deg. F: Flexible, preformed, pre-slit, self-sealing elastomeric pipe insulation up to 2-1/8" ID, thermal conductivity of 0.27 BTU/hr. sq. ft./in. at 75 deg. F and vapor transmission rating of 0.2 perms/inch. Armstrong "Armaflex 2000" or, in concealed locations, Imcoa or Nomaco also approved.
2.03 INSULATION ACCESSORIES

A. Insulation Compounds and Materials: Provide rivets, staples, bands, tapes, adhesives, cements, coatings, sealers, welded studs, etc., as recommended by the manufacturer for the insulation and conditions specified. No staples allowed on cold water piping systems.

B. PVC Protective Jacketing and Valve and Pipe Fitting Covers: Johns Manville Zeston 2000, Proto LoSmoke, Speedline Smoke Safe, or Ceel-Co Ceel-Tite 100 Series with precut fitting fiberglass insulation or approved.

C. Jacket Lap Sealing Adhesives: Foster Drion 85-75 contact cement or approved substitute.

D. Saddles and Shields: Install to prevent crushing of insulation at support points.
   1. Protection Saddles: MSS Type 39.
   2. Protection Shields: MSS Type 40.

PART 3 EXECUTION

3.01 PIPING INSULATION

A. At the contractor’s option and in accordance with Part 2 of this section, elastomeric insulation may be installed on domestic water piping in thicknesses providing overall thermal resistance equivalent to the glass fiber insulation. Increased thickness is typically required. Installation shall comply with the manufacturer’s recommendation with joints and seams completely sealed.

B. Domestic Water Piping:
   1. Insulate with glass fiber pipe covering, 1” thick for 1” and smaller hot water piping.
   2. Insulate hot water return piping same as hot water piping.

C. Pipe Fittings:
   1. Insulate and finish all fittings including valve bodies, bonnets, unions, flanges and expansion joints with precut fiberglass insulation and preformed PVC covers sealed to adjacent insulation jacket for continuous vapor barrier covering over all fittings.

D. Piping Insulation Lap Seams and Butt Joints: Install insulation jacket in accordance with manufacturer’s recommendation and without staples on cold water lines. Where jacket joint and lap seams have not adhered, remove affected section of insulation and reinstall or apply lap sealing adhesive in accordance with manufacturer’s instructions.

END OF SECTION
PART 1 GENERAL

1.01 DESCRIPTION
A. Provide pipe, pipe fittings, piping specialties, pumps and related items required for complete piping system.
B. Related Work: The requirements of Section 22 05 00, Common Plumbing Materials and Methods, also apply to this section.

1.02 QUALITY ASSURANCE
A. General: ASTM, and ANSI Standards are indicated. In addition, special standards are referenced where neither ASTM nor ANSI Standards are applicable.
B. Labeling: All piping shall be continuously and legibly labeled on each length as required by codes and standards and including as a minimum, country of origin, manufacturer’s identification marking, wall thickness designation, and applicable standards and approvals. Fittings shall be labeled as required by the referenced standard. Tubular fixture traps shall be stamped with manufacturer’s mark and material thickness.
C. Potable Water Valves: Potable water piping materials not limited to faucets, mixing valves, or pressure reducing valves. Valves shall meet NSF/ANSI Standard 61, Section 9, for drinking water faucets and shall be brass construction.
E. Definitions: Where piping fluid is not indicated in the following paragraphs, provide similar piping materials for similar fluids (i.e., “make-up water” = “domestic water”; “wet stand pipe” = “fire sprinkler pipe”; “drainage piping” = “sanitary/storm sewer piping”).
F. Plumbing System Disinfection shall be performed by an experienced, qualified, chemical treatment agency. Mt. Hood Chemical, Chemcoa, Industrial Treatment of Water, or approved alternate.

1.03 STORAGE AND HANDLING
A. Provide factory-applied end caps on each length of pipe and tube. Maintain end caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

1.04 SUBMITTALS
A. Submit catalog data for each product specified.

PART 2 PRODUCTS

2.01 PIPING MATERIALS
A. Copper Pipe and Tube:
1. Application:
   a. Domestic water
   b. Priming lines
   c. Dental Air System
2. Pipe: ASTM B88
   a. Above Ground Domestic Water: Type L hard temper copper with soldered joints.
   b. Underground Domestic Water and Priming Lines: Type L soft annealed with no joints or type K hard tempered copper with silver soldered joints.

B. Plastic Pipe:
   a. Domestic water, systems operating at less than 80 psi and 140 degrees F.
2. Pipe:
3. Fittings: Cold expansion (ASTM F1960) style fittings of the type indicated, matching piping manufacturer. Where not otherwise indicated, provide fittings produced and recommended by the piping manufacturer for the service indicated.

1. Application: Three-story or less structures and where allowed by Code only.
   a. Sanitary waste
   b. Plumbing vent
   c. Rain drain
2. Pipe:
   a. Acrylonitrile-butadiene-styrene (ABS) (ASTM D3965) plastic drain, waste and vent piping (ASTM F628) and fittings (ASTM D2661) (DWV).
   b. Poly(vinyl chloride) (ASTM D1784) (PVC) plastic drain, waste and vent pipe (ASTM D2665 and D1785) and fittings (ASTM D2665) (DWV).
3. Fittings: Provide fittings of the type indicated, matching piping manufacturer. Where not otherwise indicated, provide socket style, solvent weld fittings produced and recommended for the service indicated by the piping manufacturer.

D. Plastic Pipe:
1. Application:
   a. Cooling coil condensate drain
   b. Dental Vacuum System
2. Pipe:
   a. Schedule 40 or 80 Polyvinyl Chloride and Chlorinated Polyvinyl Chloride Plastic Pipe for Water Service: SDR-PR pipe, ASTM D2241; Schedules 40, 80 and 120, ASTM D1785.
3. Fittings: Provide fittings of the type indicated, matching piping manufacturer. Where not otherwise indicated, provide socket style, solvent weld fittings produced and recommended by the piping manufacturer for the service indicated.

2.02 MISCELLANEOUS PIPING MATERIALS

A. Insulating (Dielectric) Fittings: Provide standard products recommended by the manufacturer for use in the service indicated, and which effectively isolate ferrous from non-ferrous piping (electrical conductance), prevent galvanic action, and reduce corrosion. Victaulic "Clear Flow."

B. Soldering and Brazing Materials: Provide soldering materials as determined by the installer to comply with installation requirements.
1. Tin-Antimony Solder: ASTM B32, Grade 95TA.
2. Lead-Free Solder: ASTM B32, Grade HB. Harris "Bridgit" approved.
3. Silver Solder: ASTM B32, Grade 96.5TS.
5. Brazing filler rod: BCuP rod to suit conditions.

2.03 PIPING SPECIALTIES

A. Cleanouts:
1. Manufacturer: J.R. Smith, Zurn, Wade, Watts, Josam, Mifab, Sioux Chief, or approved substitute.
2. Types:
   a. Tile Floor Cleanouts: Smith 4053-U with square heavy-duty nickel bronze top, bronze plug, and vandalproof screws. Adjustable top where cast into floor slab.
   b. Carpeted Floor Cleanout: Smith 4023-U-X with round heavy-duty nickel bronze top, bronze plug, carpet clamping device, and vandalproof screws. Adjustable top where cast into floor slab.
c. Concrete Floor Cleanout: Smith 4023 with round heavy-duty nickel bronze top. Adjustable top where cast into floor slab.

d. Wall Cleanouts: Smith 4472-U, bronze ferrule with raised head bronze plug, stainless steel shallow cover and vandalproof screws.

e. Plastic Body Cleanouts: At contractor’s option, where ABS-DWV or PVC-DWV piping is approved, compatible plastic body cleanouts may be substituted. Cleanouts shall have finished tops of style and material as specified above.

B. Drains:
   1. Manufacturers: Zurn, Jay R. Smith, Josam, Watts, Wade, Froet Industries, Mifab, Sioux Chief, or approved substitute. Where numbers are scheduled on the drawings they represent minimum the acceptable standard for locations involved.
   2. Cast iron construction with acid resistant coating, anchor flange, and other options as indicated by model number listed on the drawings. PVC drains where specifically noted. Cast iron dome strainers on roof drains.
   3. Plastic Body Drains: At contractor’s option, where ABS-DWV or PVC-DWV piping is approved, compatible plastic body drains may be substituted. Drains shall have finished tops of style and material as indicated by model number listed on the drawings.
   4. Install sheet flashing, extending not less than 10" from and clamped to all drains not completely cast-in-place in a homogeneous material.

C. Shock Arrester: Precharged bellows or sealed piston type manufactured to meet PDI WH-201 and ASSE 1010 Standards. Size in accordance with PDI procedures. J. R. Smith, PPP, Sioux Chief, Wade, Zurn, Watts, Josam, or approved substitute.

D. Priming Valves: Smith 2699, Josam 88250, Wade W8800T, Zurn Z1022, Watts MS810 or equivalent Precision Plumbing, Mifab. Locate in closets, under counters or in walls behind access panels as specified in Section 22 0500. Use copper specified previously for all underground priming lines.

E. Traps: Except chrome plated fixture traps. Recessed drainage pattern for threaded pipe and same grade as pipe for cast iron and plastic pipe; with cleanout plugs in trap body in all above grade locations.

2.04 PUMPS

A. Domestic Hot Water Circulator: Bronze body, bronze fitted, in-line circulator with sleeve bearing. Bell & Gossett or equivalent Grundfos, Thrush, Wilo, Taco, or Armstrong. Provide with 7-day programmable electronic time clock and aquastat to start and stop the pump.

PART 3 EXECUTION

3.01 PIPE INSTALLATION

A. General: Install pipe, tube and fittings in accordance with recognized industry practices, manufacturers instructions, and plumbing code standards. Install each run accurately aligned with a minimum of joints and couplings, but with adequate and accessible unions and flanges for disassembly, maintenance and/or replacement of valves and equipment. Reduce sizes (where indicated) by use of reducing fittings.

B. Piping Runs: Route piping close to and parallel with walls, overhead construction, columns and other structural and permanent-enclosure elements of the building. Install piping plumb and level except where pitched for drainage. If not otherwise indicated, run piping in the shortest route which does not obstruct usable space or block access for servicing the building or equipment and avoid diagonal runs. Wherever possible in finished and occupied spaces, conceal piping from view. Do not encase horizontal runs in solid (concrete or CMU) partitions.

C. Changes in Direction: Use fittings for all changes in direction. Run lines parallel with building surfaces.

D. Line Grades:
   1. Drainage Lines: Run at maximum possible grade and in no case less than 1/4" per foot within building.
2. Vents: Pitch for drainage 1/4” per 10’.
3. Water: Pitch to low points and install hose bib drains. 3’ minimum depth of ground cover for all lines outside building unless otherwise noted.

E. Unions and Flanges: At all equipment to permit dismantling and elsewhere as consistent with good installation practice.

F. Expansion: Provide loops, swing joints, anchors, runouts and spring pieces to prevent damage to piping or equipment.

G. Insulating (Dielectric) Fittings: Comply with manufacturer’s instructions for installing unions or fittings. Install in a manner which will prevent galvanic action and stop corrosion where the “joining of ferrous and non-ferrous piping” is indicated.

H. For Dental Air and Vacuum system, refer to plans provided by Dental Equipment Supplier for installation requirements and details.

3.02 PIPING JOINTS

A. General: Provide joints of the type indicated in each piping system, and where piping and joint as manufactured form a system, utilize only that manufacturer’s material.

B. Solder Copper Tube and Fitting Joints: In accordance ANSI B 828 with recognized industry practice. Cut tube ends squarely, ream to full inside diameter, and clean outside of tube ends and inside of fittings. Apply solder flux to joint areas of both tubes and fittings. Insert tube full depth into fitting, and solder in a manner which will draw solder full depth and circumference of joint. Wipe excess solder from joint before it hardens. "T-Drill" field formed tees may be utilized where the main is at least two pipe sizes larger than the branch.

C. Plastic Pipe/Tube Joints: Comply with manufacturer’s instructions and recommendations, and with applicable industry standards:

3.03 CLEANOUTS

A. Where required by code, at each change of sewer direction 45 degrees or greater and more than 10’ long, at end of each branch or main and spaced not greater than 100’ apart, as required by code and/or as shown on Drawings. Provide cleanouts beneath all sinks.

3.04 MISCELLANEOUS PIPING EQUIPMENT

A. Floor, Wall and Ceiling Plates: Chrome plated pressed steel or brass screw locked split plates on all pipe penetrations in finished spaces.

B. Strainers: Install in a manner to permit access for cleaning and screen removal and with blow-off valve.

C. Sleeves: At all penetrations of masonry or cast in place concrete construction. PVC, 24 gauge galvanized steel tube or Schedule 40 galvanized steel pipe. Use steel pipe sleeves through beams, footings, girders or columns and for all penetrations of walls or floors below grade. Where floor finish is ceramic tile, terrazzo, or similar material extend standard steel pipe sleeves 1-1/2” above finished floor. Fabricate sleeves 1” diameter larger than pipe or insulation. PVC and sheet metal sleeves at non-structural penetrations only. Use specified sleeve system for all above grade concrete floor applications.

D. Sleeve Caulking: Caulk below grade pipe with rubber link seal. Grout above grade pipe with cement mortar or approved waterproof mastic. All caulking or grouting shall extend full depth of sleeve. Utilize rubber sealing links in lieu of caulking. Install UL sealing caulk, putty and/or system at all penetrations of fire rated walls, floors and ceiling.
E. Shock Arrestors: Install at end of mains, in a battery of three or more flush valve-operated fixtures water header, ahead of quick closing and solenoid operated valves. Size per PDI recommendations where size is not indicated. Provide access panels.

F. Trap Priming: Traps serving floor drains, floor sinks, catch basins, and similar fixtures shall be primed in accordance with Code requirements.

G. Pressure Reducing Valve: Single seat type with renewable stainless steel seat and valve. Size and capacity as shown on Drawings. Bronze bodies with screwed connections on valves 2-1/2" and smaller and flanged steel bodies on valves 3" and larger. Install each PRV with strainer on inlet or internal strainer. Watts only.

I. Backflow Preventer: Where indicated on the Drawings, install a double check backflow preventer complete with shutoff valves, two separate check valves, and test cocks. USC Foundation for Cross Connection Control, State Health Officials, and serving utility approved. Bronze bodies on units 2" and smaller, and cast iron bodies with bronze trim on units 2-1/2" and larger. Wilkins/Zurn only.

H. Reduced Pressure Backflow Preventer: Where indicated on the Drawings, install a reduced pressure backflow preventer complete with shutoff valves, two separate check valves, differential relief valve, and test cocks. USC Foundation for Cross Connection Control, State Health Officials, and serving utility approved. Bronze bodies on units 2" and smaller, and cast iron bodies with bronze trim on units 2-1/2" and larger. Watts, Zurn, Wilkins.

3.05 CLEANING

A. General: Clean all dirt and construction dust and debris from all mechanical piping systems and leave in a new condition. Touch up paint where necessary.

B. Disinfection of Domestic Water Piping System:
   1. Prior to starting work, verify system is complete and clean.
   2. Open all drains and fixtures valves in the building starting with the valve nearest the water service line and permit the water to run clear for 10 minutes to eliminate grease, cuttings, flux, and foreign matter.
   3. Disinfect piping system in accordance with ANSI/AWWA C651-92 standard.
   4. Take samples from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C601. If any sample fails the analysis, repeat the procedure.
   5. Include a copy of the bacteriological analysis in the Operating and Maintenance manuals.

C. Sanitary and Storm Drainage System:
   1. Remove construction debris from cleanouts, drains, strainers, baskets, traps, etc., and leave same accessible and operable. Place plugs in the end of uncompleted piping at the end of the day or whenever work stops.

3.06 TEST

A. General:
   1. Minimum duration of two hours or longer, as directed for all tests. Furnish report of test observation signed by qualified inspector. Make all tests before applying insulation, backfilling, or otherwise concealing piping or connecting fixtures or equipment. Where part of the system must be tested to avoid concealment before the entire system is complete, test that portion separately, same as for entire system.
   2. Provide all necessary temporary equipment for testing, including pump and gauges. Remove control devices before testing and do not use piping system valves to isolate sections where test pressure exceeds valve pressure rating. Fill each section with water and pressurize for the indicated pressure and time.
   3. Observe each test section for leakage at end of test period. Test fails if leakage is observed or if pressure drop exceeds 5% of test pressure.

B. Repair:
1. Repair piping system sections which fail the required piping test by disassembly and re-installation, using new materials to the extent required to overcome leakage. Do not use chemical stop-leak compounds, solder, mastics, or other temporary repair methods.
2. Drain test water from piping systems after testing and repair work has been completed.

C. Sewer: Furnish all facilities and personnel for conducting the test. Test in accordance with the requirements of the State Plumbing Inspector and local authorities.

D. Plumbing Waste and Vent Piping: Hydrostatic test by filling to highest point, but not less than 10' water column on major horizontal portion.

E. Water Piping: Hydrostatic pressure of 100 psig without loss for four hours.

3. SUPERVISION AND START-UP
   
   A. Adjust flush valves, pressure reducing valves, mixing valves, water heater thermostats, domestic hot water circulating system balancing valves, and similar equipment.

   B. Domestic hot water system balancing: Adjust domestic hot water recirculating balancing valves to equalize return temperatures from each branch line.

END OF SECTION
SECTION 22 4000

PLUMBING FIXTURES

PART 1  GENERAL

1.01  DESCRIPTION

A. The requirements of this section apply to the plumbing fixtures and trim.

B. Provide fixtures as shown on the Drawings and specified herein. Provide all required fixture trim and accessories for a complete, finished installation.

C. Related Work: The requirements of Section 22 0500, Common Plumbing Materials and Methods, also apply to this section.

1.02  QUALITY ASSURANCE

A. Code: Comply with requirements of the Oregon State Plumbing Specialty Code.

B. Fixture color: White unless indicated otherwise.

C. Potable Water Valves: Potable water valves not limited to faucets, mixing valves, or pressure reducing valves. Valves shall meet NSF Standard 61, Section 9, for drinking water faucets and shall be brass construction. Brass components which contact water within the faucet shall be from brass which contains no more than 0.25 percent lead by dry weight.

PART 2  PRODUCTS

2.01  PIPING

A. Piping, fittings, and related items as specified in related Sections 22 1000.

2.02  INTERIOR PLUMBING MATERIALS

A. Shock Arrester: Precharged bellows or sealed piston type manufactured to meet PDI WH-201 and ASSE 1010 Standards. Size in accordance with PDI procedures. J. R. Smith, PPP, Sioux Chief, Wade, Zurn, Watts, Josam, or approved substitute.

B. Secondary piping supports: Install manufactured secondary piping supports for support and positioning of fixture rough-in piping from framing members. Hubbard, Sioux-Chief, or approved substitute.

2.03  PLUMBING FIXTURES AND TRIM

A. Stops: Furnish stop valves for all fixtures. Wheel handle style, in wall, angle or straight through pattern to fit installation. Stops to be all brass with full turn brass stem and replaceable washer, no plastic. Compression nuts to be high copper content brass. Finish to be copper nickel chrome plate. Product to carry manufacturer’s name. Risers to be chrome plated copper. Provide chrome plated shallow escutcheons. McGuire, Chicago, Brasskraft, Keeney, Zurn, or approved substitute.

B. Fixture Traps: Exposed fixture tailpieces, traps, and wastes shall be chrome plated 17 gauge seamless brass tube with cast brass nuts and deep or box style escutcheons as required to conceal rough piping. Products to be stamped with manufacturer’s name and material gauge. McGuire, Keeney, Zurn, or approved.

C. Provide insulating covers on all exposed accessible lavatory and sink fixture traps and water supplies. Covers to be ASTM C1822 compliant.

D. 1.6 Gallon, Water Closet, Tank Type, Vitreous China: Water closet shall be specifically designed for 1.6 gallon siphon jet flush.
1. Seat: Solid white heavy weight molded plastic seat, with molded-in bumpers; open front less cover for elongated bowl with check and self-sustaining hinge. Hinge and hardware to be 300 series stainless steel. Church 295-SSC, Beneke 523-SS/CH-B, Bemis 1955 SS/C, or Zurn Z5956SS-EL-STS.

2. Floor Mounted, 18" High "WC-1": American Standard 2998.010, or Kohler K-3427, Eljer 091-0285.

E. Lavatory, Vitreous China:
1. Faucet: Chrome plated metal body with lever handle, vandal resistant 0.5 gpm aerator, mixing valve, with grid strainer waste. Moen WSL84533 or approved alternate. Provide under counter mixing valve certified to ASSE 1070 or CSA B125.3 and NSF Standard 61 Watts LF MMV Series or approved equal.


F. Stainless Steel Sinks:
1. Type 302 or 304, 18 gauge, self-rimming stainless steel sink, fully undercoated, drawn bowl with satin finish. Elkay numbers are listed; or approved substitute. Install with stainless steel crumb cup strainer outlet, flange tail piece, and 1-1/2" trap; Install with Garbage Dispower, InSinkErator 3/4HP Evolution Compact Garbage Disposal. Elkay, Keeney, or approved. Faucet: Moen 7425.

2. Single Compartment "S-1": Elkay_LR2222.

G. Fixtures Furnished by Owner (and/or Under Another Section): Some fixtures will be furnished by the Owner (and/or under another specification section). Include under this section the required rough-ins, 3/8" chrome plated supplies with stops, 1-1/2" chrome plated cast brass "P" trap (or, on kitchen sinks, 2" cast iron "P" traps) for each sink compartment, and make final connection. Verify all rough-ins and connection requirements before commencing work.

PART 3 EXECUTION

3.01 PIPING
A. Install in accordance with Section 22 1000.
B. Install secondary pipe supports at rough-ins for all plumbing fixtures.

3.02 FIXTURE INSTALLATION AND CONNECTION
A. All exposed fixture hardware and piping shall be plated with polished chrome unless otherwise directed in these specifications.
B. All fixtures in contact with finished walls and floors shall be caulked with waterproof, white, non-hardening sealant which will not crack, shrink or change color with age.
C. All fixtures and component parts shall conform to governing codes.
D. All fixtures shall be securely mounted level and plumb or as recommended by the manufacturer. Mount fixtures intended to be accessible to the handicapped at the dimensions required by code.

3.03 STARTUP
A. Adjust flush valves, pressure reducing valves, mixing valves, water heater thermostats, hot water circulating system balancing valves, and similar equipment.
B. Remove construction protection, tags and labels and thoroughly clean all plumbing equipment and trim. Scour all fixtures just prior to building acceptance.

END OF SECTION
SECTION 23 0500
COMMON HVAC MATERIALS AND METHODS

PART 1 GENERAL

1.01 DESCRIPTION
A. The provisions of the General Requirements, Supplementary Requirements, and Division 1 apply to the HVAC work specified in this Division.
B. The requirements of this Section apply to the HVAC systems specified in these Specifications and in other Division 23 sections.
C. Provide all items, articles, materials, equipment, operations and/or methods listed, mentioned, shown and/or scheduled on the Drawings and/or in these Specifications, including all labor, supervision, services, permits, fees, and incidentals necessary and required to provide a complete and operable facility with complete systems as shown, specified, and required by applicable codes.
D. The work shall include, but not be limited to, the following systems:
   1. Complete piping systems including insulation, valves, supports, etc.
   2. Air handling equipment including packaged equipment and exhaust fans.
   3. Air distribution systems including ductwork, terminal units, dampers, insulation, and air inlets and outlets.
   4. Condensate drainage system.
   5. HVAC control system.
   6. Special systems as specified herein.
E. Advise subcontractor, suppliers, and vendors involved in the work specified in this Section of the applicable requirements.

1.02 QUALITY ASSURANCE
A. All work and materials shall conform to all applicable local and state codes and all federal, state and other applicable laws and regulations. All clarifications and modifications which have been cleared with appropriate authorities are listed under the applicable sections. All electrical products shall bear the label of a recognized testing laboratory such as UL or CSA.
B. Whenever the requirements of the Specifications or Drawings exceed those of the applicable code or standard, the requirements of the Specifications and Drawings shall govern.
C. Codes and Standards: Comply with the provisions of the following referenced codes, standards and specifications:
   1. Federal Specifications (FS)
   2. American National Standards Institute (ANSI)
   3. National Electrical Manufacturer's Association (NEMA)
   4. National Fire Protection Association (NFPA)
   5. Underwriters Laboratories, Inc. (UL)
   6. Factory Mutual (FM)
   7. International Building Code (IBC) with State and Local Amendments
   8. International Mechanical Code (IMC) with State and Local Amendments
   9. Uniform Plumbing Code (UPC) with State and Local Amendments
   10. American Society for Testing and Materials (ASTM)
   11. Americans with Disabilities Act (ADA)
   12. International Fire Code (IFC) with State and Local Amendments
   14. Manufacturers Standardization Society (MSS)
   15. American Gas Association (AGA)
D. Each piece of equipment furnished shall meet all detailed requirements of the Drawings and Specifications and shall be suitable for the installation shown. Equipment not meeting all requirements will not be acceptable, even though specified by name. Where two or more units of the same class of equipment are furnished, use product of the same manufacturer; component parts of the entire system need not be products of same manufacturer. Furnish all materials and equipment, new and free from defect and of size, make, type and quality herein specified or approved by the Architect. All materials shall be installed in a neat and professional manner.

E. All apparatus shall be built and installed to deliver its full rated capacity at the efficiency for which it was designed.

F. The Drawings and Specifications are complementary. What is called for by one shall be as though called for by both.

G. Drawings: Do not scale drawings for roughing-in measurements, nor use as shop drawings. Make field measurements and prepare shop drawings as required. Coordinate work with shop drawings of other specification divisions.

H. Field Wiring: It is the intent of these specifications that all systems shall be complete and operable. Refer to all drawings and specifications, especially the electrical drawings, to determine voltage, phase, circuit ampacity and number of connections provided. Provide all necessary field wiring and devices from the point of connection indicated on the electrical drawings. All equipment shall be installed in compliance with the Electrical Code and the equipment’s UL listing. Bring to the attention of the Architect in writing, all conflicts, incompatibilities, and/or discrepancies prior to bid or as soon as discovered.

1.03 WORK OF OTHER CONTRACTS

A. Work under this contract shall be conducted in a manner to allow for the future installations of such equipment or items listed in other sections of this Specification.

1.04 WORK OF OTHER DIVISIONS

A. Work under this Division shall be conducted in a manner to cooperate with the installation of such equipment or items as specified in other Divisions.

B. Plumbing piping systems and fixtures and fire suppression piping systems are specified under other Divisions of these Specifications except for provisions or items specifically noted on the Drawings or specified herein.

C. Consult all Drawings and Specifications in this project and become familiar with all equipment to be installed. Coordinate all aspects of the construction with the other trades on the job to ensure that all work and materials required to provide a complete and operational facility are included in the bid.

D. All sections of Division 23 are interrelated and shall be considered in their entirety when interpreting any material, method, or direction listed in any section of Division 23. Individual sections are not written for specific subcontractors or suppliers but for the general contractor.

1.05 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES (SUBMITTALS)

A. Submit in accordance with Division 1 full technical and descriptive shop drawing data on proposed materials and equipment as detailed in each section.

B. The Contractor shall verify that all equipment submitted can be delivered and installed within the time constraints of the construction period.

C. Include the manufacturer, type, style, catalog number, complete specification, certified dimensions, and description of physical appearance for each item and option submitted. Reproduction of catalog data sheets shall be clean and legible to show all details, including gauge of metal used.
D. Include only information on exact equipment to be installed, not general catalogs of the manufacturer. Where sheets show proposed equipment as well as other equipment, identify proposed equipment with rubber stamp arrow or similar concise method.

E. Submit with each copy a transmittal letter verifying that all included equipment submittals have been carefully considered for quality, dimensions, function, and have been coordinated with the Drawings and Specifications. Guarantee that proposed materials will meet or exceed the quality and function of those specified.

F. Include field wiring diagrams and connection diagrams for all control and/or low voltage systems, including floor plans.

G. Submittal Review: The submittal review process is a means to provide quality control. The action noted to be taken (or where conflicts with the contract documents are not noted) shall not be interpreted by the Contractor as automatic "change orders." Approval of the data for substitution and shop drawings shall not eliminate the contractor's responsibility for compliance with Drawings or Specifications, nor shall it eliminate the responsibility for freedom from errors of any sort in the data discovered prior to or after the review process. Deviations, discrepancies, and conflicts between the submittals and the Contract Documents shall be called to the Architect's attention in writing at the time of transmittal of the data.

H. Unless otherwise directed by Division 1, submittal data shall be in a 3-ring plastic binder with a clear plastic sleeve and a project identification sheet inserted. Arrange submittals numerically with specification sections identified on divider tabs. All required sections shall be submitted at one time.

1.06 PRODUCT SUBSTITUTION

A. Materials other than those specified may be approved for this project providing a written request is submitted to the Architect prior to bid in accordance with Instructions to Bidders. Requests shall include complete specifications, dimensions, manufacturer and catalog number for each item for which approval is desired. If, in the opinion of the Architect, the material is not complete or if it is not an acceptable substitute, he may reject it. The Architect's evaluation will be based solely on the material submitted.

1.07 CHANGE ORDERS

A. All supplemental cost proposals by the Contractor shall be accompanied by a complete itemized breakdown of labor and materials without exception. At the Architect's request, the contractor's estimating sheets for the supplemental cost proposals shall be made available to the Architect. Labor must be separated and allocated for each item of work.

1.08 RECORD DOCUMENTS

A. Project Record (As-Installed) Drawings:
1. Maintain a set of record drawings on the job site as directed in Division 1.
2. Keep Drawings clean, undamaged, and up to date.
3. Record and accurately indicate the following:
   a. Depths, sizes, and locations of all buried and concealed piping dimensioned from permanent building features.
   b. Locations of all valves with assigned tag numbers.
   c. Locations of all fire dampers and other airflow control devices.
   d. Changes, additions, and revisions due to change orders, obstructions, etc. Eradicate extraneous information.
   e. Model numbers of installed equipment.
4. Make Drawings available when requested by Architect for review.
5. Submit as part of the required Project Closeout documents. Final submittal will be accomplished in Auto Cad.
B. Operating and Maintenance Manuals: Submit three (3) sets of Operating and Maintenance Instructions, including manufacturer's service data, wiring diagrams, and parts lists and vendors for all serviceable items of equipment, valve charts, balancing data, final control diagrams showing final set points, and any additional equipment added by change order, bound in three-ring, vinyl covered, loose-leaf binders organized with index and thumb-tab markers for each classification of equipment or data.

1.09 WARRANTY

A. Furnish, prior to application for final payment, three copies of written and signed guarantee effective a period of one year from date of completion and acceptance of entire project; agree to correct, repair and/or replace defective materials and/or equipment or the results of defective workmanship without additional expense to the Owner. Where no response satisfactory to the Owner has occurred within three working days from the written report of a warranty covered defect, the contractor shall agree to pay for the cost of repair of the reported defect by a contractor of the Owner's choice.

B. Where the manufacturer's guarantee exceeds one year, the longer guarantee shall govern and include the Contractor's labor.

PART 2 PRODUCTS

2.01 GENERAL

A. General: Provide all new materials and equipment, identical to apparatus or equipment in successful operation for a minimum of two years. Provide materials of comparable quality omitted here but necessary to complete the work. Maximum allowable variation from stated capacities, minus 5% to plus 10% as approved in each case.

B. Compatibility: Provide products which are compatible with other portions of the work and provide products with the proper or correct power and fuel-burning characteristics, and similar adaptations for the project.

C. Efficiency: Heating and cooling equipment shall comply with ASHRAE Standard 90.1-2010 or latest version and the State Energy Code. Where equipment efficiencies are indicated, the use of alternate or substitute manufacturer's equipment with lower efficiencies is not permitted.

D. Storage and Handling:
   1. Delivery: Deliver to project site with manufacturer's labels intact and legible.
   2. Handling: Avoid damage.
   3. Storage: Inside protected from weather, dirt and construction dust. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

2.02 ACCESS PANELS

A. Manufacturers: Inryco/Milcor, Bilco, Elmdor, Karp, Potter-Roemer or accepted substitute. Inryco/Milcor Style DW, K, or M panels as required by construction.

B. Construction: Flush style, fire rated in fire rated partitions and ceilings. Screwdriver latches on all panels.

2.03 HANGERS AND SUPPORTS

A. General: Provide factory-fabricated horizontal piping hangers, clamps, hanger rod, inserts, supports, etc., of the indicated MSS type and size. The Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry Practice SP-58 and SP-69 are referenced in this section.

B. Manufacturers: B-Line, Carpenter & Paterson, Grinnell, Michigan, Superstrut, Tolco, Erico, or accepted substitute. Grinnell figure numbers in parentheses where applicable (or other manufacturers as noted).
C. Corrosion Protection: Provide materials which are zinc plated or factory painted to prevent corrosion. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated, plastic coated, or by other recognized industry methods.


E. Horizontal Piping Hangers and Supports:
   1. Adjustable Clevis Hanger: MSS Type 1 (Fig. 260).
   2. Adjustable Band Hanger: MSS Type 7 (Fig. 97), fabricated from steel.
   3. Adjustable Swivel-Band Hanger: MSS Type 10 (Fig. 70).
   4. Clamp: MSS Type 4 (Fig. 212, 216).

PART 3 EXECUTION

3.01 LAYOUT AND COORDINATION

A. Site Examination: Before starting work, carefully examine site and all contract Drawings. Become thoroughly familiar with conditions governing work on this project. Verify all indicated elevations, building measurements, roughing-in dimensions and equipment locations before proceeding with any of the work.

B. Utility Locations: The location of existing utilities, wires, conduits, pipes, ducts, or other service facilities are shown in a general way only on the Drawings and are taken from existing records. Ascertain whether any additional facilities other than those shown on the plans may be present and determine the exact location and elevations of all utilities prior to commencing installation.

C. Sleeves, Inserts, Cast-in-Place Work: Provide sleeves, inserts, anchoring devices, cast-in-place work, etc. which must be set in concrete sequenced at the proper time for the project schedule.

D. Coordination:
   1. The drawings are based on equipment of a certain manufacturer and may be identified as such. Where alternate manufacturers or approved substitutes are incorporated into the work, any required design changes are the responsibility of the contractor. Such changes may include changes in utility or system connection sizes, location, or orientation, service clearances, structural support or acoustic considerations.
   2. Where the work must be sequenced and positioned with precision in order to fit into the available space, prepare accurate scale shop drawings showing the actual physical dimensions required for the installation and submit prior to purchase/fabrication/installation of any of the elements involved in the coordination.
   3. Cooperate with other trades in furnishing material and information for sleeves, bucks, chases, mountings, backing, foundations and wiring required for installation of mechanical items.
   4. Coordinate all work with other trades and determine in advance where interfacing of the mechanical work and other work are required to be connected together. Provide all materials and equipment to make those connections. Submit shop drawings showing required connections where special conditions exist.

E. Discrepancies: Report immediately any error, conflict or discrepancy in Plans, Specifications and/or existing conditions. Do not proceed with any questionable items of work until clarification of same has been made. Should rearrangement or re-routing of piping be necessary, provide for approval the simplest layout possible for that particular portion of the work.

3.02 CONTINUITY OF EXISTING SERVICES

A. Existing water, power, heat, ventilation, air conditioning and other services shall remain in service during new construction work. Coordinate any interruption of these services with the Owner’s representative a minimum of twenty-four (24) hours in advance. Arrange work to minimize number and extent of all interruptions.
B. Protect from damage active utilities existing and evident by reasonable inspection of the site whether shown or not on the Drawings. Protect, relocate or abandon utilities encountered in the work which are not shown on the Drawings or evident by inspection of the work as directed by the Architect. Maintain continuity of all utility services to existing buildings.

C. All necessary service interruptions of utilities shall be scheduled with the Director of Physical Plant. Minor interruptions will require a minimum of forty-eight (48) hours prior notification. Major shut down of any utility is to be scheduled between the hours of 5:30 p.m. and 6:00 a.m. and will require a minimum of seven (7) days prior notice.

3.03 EQUIPMENT REMOVAL

A. All removed mechanical equipment is the property of the Contractor unless indicated otherwise. Disconnect and remove all such equipment from the project property. Cap all piping in walls, below floors, and/or above ceilings in finished rooms. Comply with Section 02050, Demolition.

B. Reused Equipment: Reconnect piping, wiring and/or controls to restore original equipment functions unless indicated otherwise.

3.04 MECHANICAL EQUIPMENT WIRING

A. Provide all mechanical equipment motors, automatic temperature, limit, float and similar control devices required, with wiring complete from power source indicated on Electrical Drawings.

B. Provide properly rated motor overload and undervoltage protection and all manual or automatic motor operating devices for all mechanical equipment.

C. Equipment and systems shown on the Drawings and/or specified, are based upon requirements of specific manufacturers which are intended as somewhat typical of several makes which may be approved. Provide all field wiring and/or devices necessary for a complete and operable system including controls for the actual selected equipment/system.

3.05 GENERAL INSTALLATION

A. Locating and Positioning Equipment: Observe all Codes, Regulations and good common practice in locating and installing mechanical equipment and material so that completed installation presents the least possible hazard. Maintain adequate clearances for repair and service to all equipment and comply with Code requirements.

B. Arrangement: Arrange piping parallel with primary lines of the building construction, and with a minimum of 7' overhead clearance in all areas where possible. Unless indicated otherwise, conceal all piping. Locate operating and control equipment properly to provide easy access, and arrange entire mechanical work with adequate access for operation and maintenance. Give right-of-way to piping which must slope for drainage. Set all equipment level or as recommended by manufacturer. Under no conditions shall beams, girders, footings or columns be cut for mechanical items. Casting of pipes into concrete is prohibited unless so shown on Drawings.

C. Drip Pans: Provide drip pans under all above ceiling in-line pumps and cooling coils. Locate pan immediately below piping and equipment, and extend a minimum of 6" on each side and lengthwise 18" beyond equipment being protected. Fabricate pans 2" deep, of reinforced 20 gauge galvanized sheet metal with watertight seams and rolled or hemmed edges. Provide 3/4" drainage piping, piped independently of any cooling coil primary condensate drain, and properly discharged to over floor drain or as shown on the Drawings. Comply with Mechanical Code for overflow protection and pipe sizing.
D. Access Panels: Provide access panels with proper backing reinforcement for all equipment, dielectric unions, valves and items requiring service and installed above ceilings, behind walls, or in furring, complete with correct frame for type of building construction involved. Exact size, number and location of access panels are not necessarily shown on Drawings. Use no panel smaller than 12" by 12" for simple manual access or smaller than 16" x 20" where personnel must pass through.

E. Adjusting: Adjust and calibrate all automatic mechanical equipment, temperature controls, float devices, etc. Adjust flow rates at each piece of equipment or fixture.

F. Building Vapor Barrier: Wherever the building insulation vapor barrier is penetrated by piping, hangers, conduits, etc., provide clear self-adhesive tape recommended by the insulation manufacturer around the penetrations.

3.06 INSTALLATION OF HANGERS AND SUPPORTS

A. General: Proceed with the installation of hangers, supports and anchors only after the required building structural work has been completed in areas where the work is to be installed. Correct inadequacies including (but not limited to) the proper placement of inserts, anchors and other building structural attachments.

1. Install hangers, supports, clamps, and attachments to support piping and equipment properly from the building structure. Use no wire or perforated metal to support piping, and no supports from other piping or equipment. For exposed continuous pipe runs, install hangers and supports of the same type and style as installed for adjacent similar piping.

2. Prevent electrolysis in the support of copper tubing by the use of hangers and supports which are copper plated or by other recognized industry methods.

3. Support fire sprinkler piping independently of other piping and in accordance with NFPA Pamphlet 13.

4. Arrange supports to prevent eccentric loading of joists and joist girders. Locate supports at panel points only.

B. Provisions for Movement:

1. Install hangers and supports to allow controlled movement of piping systems and to permit freedom of movement between pipe anchors, and to facilitate the action of expansion joints, expansion loops, expansion bends and similar units. Install specified seismic restraints to restrict excessive movement.

2. Install hangers and supports so that equipment and piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

3. Install hangers and supports to provide the indicated pipe slopes, and so that maximum pipe deflections allowed by ANSI B31 are not exceeded. Comply with the following installation requirements:
   a. Clamps: Attach clamps, including spacers (if any), to piping outside the insulated piping support. Do not exceed pipe stresses allowed by ANSI B31.
   b. Insulated Pipe Supports: Insulated pipe supports shall be supplied and installed on all insulated pipe and tubing.
   c. Load Rating: All insulated pipe supports shall be load rated by the manufacturer based upon testing and analysis in conformance with ASME B31.1, MSS SP-58, MSS SP-69 and MSS SP-89.
   d. Support Type: Manufacturer's recommendations, hanger style and load shall determine support type.

C. Pipe Support:

1. Screwed or Welded Steel or Copper Piping: Maximum hanger spacing shall be as follows:

<table>
<thead>
<tr>
<th>Material</th>
<th>Steel</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/4&quot; and smaller</td>
<td>7' span</td>
<td>6' span</td>
</tr>
</tbody>
</table>

D. Adjust hangers and supports to bring piping to proper levels and elevations.

E. Provide all necessary structural attachments such as anchors, beam clamps, hanger flanges and brackets in accordance with MSS SP-69. Attachments to beams wherever possible. Supports suspended from other piping, equipment, metal decking, etc., are not acceptable.
3.07 EQUIPMENT CONNECTIONS

A. Provide complete connections for all items of equipment requiring such connections, including incidental piping, fittings, trim and labor necessary for a finished working installation. Provide a complete condensate drainage system piped to an approved receptor for all equipment with evaporator coils.

B. Verify the rough-in and finish requirements for all equipment provided under other Divisions of the work and requiring HVAC piping or duct connections with equipment supplier and installer prior to rough-in.

3.08 PROTECTION

A. Protect all work and materials against loss or damage. Close all pipe openings with caps or plugs. At final completion, thoroughly clean and deliver all work and equipment in an unblemished new condition. Keep all motors and bearings in watertight and dustproof covers during entire course of installation.

3.09 CUTTING AND PATCHING

A. General: Comply with the requirements of Division 1 for the cutting and patching of other work to accommodate the installation of mechanical work. Do all necessary cutting and patching of existing building and yard surfaces required for completion of the mechanical work. Patch to match finish and color of adjacent surfaces for remodels. Coordinate work in remodel and new areas to avoid cutting of new finished surfaces.

3.10 HVAC WORK CLOSEOUT

A. General: Refer to the Division 1 sections for general closeout requirements. Calibrate all equipment requiring same. Complete each system as shown or specified herein and place in operation except where only roughing-in or partial systems are called for. Each system shall be tested and left in proper operation free of leaks, obstructions, or contamination.

B. Record Drawings: Submit record set of drawings as previously specified in this Section.

C. Closeout Equipment/Systems Operations: Sequence operations properly so that work of project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment and each system in a test run of appropriate duration with the Architect present, and with the Owner's operating personnel present, to demonstrate sustained, satisfactory performance. Adjust and correct operations as required for proper performance. Clean and lubricate each system and replace dirty filters, excessively worn parts and similar expendable items of the work.

D. Operating Instructions: Conduct a walk-through instruction seminar for the Owner's personnel who are to be involved in the continued operation and maintenance of the HVAC equipment and systems. Provide written instructions outlining and explaining the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the systems.

END OF SECTION
SECTION 23 0590
TESTING, ADJUSTING AND BALANCING

PART 1 GENERAL

1.01 DESCRIPTION

A. Work Included: After completion of the work of installation, test and regulate all components of the new heating, air conditioning and ventilating systems to verify air volumes and heating-cooling flow rates indicated on the Drawings.

B. Related Work: The requirements of Section 23 0500, Common HVAC Materials and Methods, also apply to this section.

C. Balancing Organization:
   2. Provide all necessary personnel, equipment, and services.

1.02 QUALITY ASSURANCE

A. Balancing of the Heating and Air Conditioning Systems: Agency shall be a current member of NEBB or AABC specializing in the adjusting and balancing of systems specified with a minimum of 10 years documented experience.

B. Testing, adjusting, and balancing shall be performed under direct field supervision of a Certified NEBB Supervisor or a Certified AABC Supervisor.

1.03 SUBMITTALS

A. Balancing Data: Include the following minimum information in the Operation and Maintenance Data, as specified in Section 23 0500.
   1. Names or initials of personnel performing the balancing.
   2. Dates balancing was performed.
   3. List of balancing instruments utilized.
   4. Weather conditions at the time of the test.
   5. Mechanical system descriptions.
   6. All motor rated voltages, amps, starter and overload protective device sizes.
   7. All motor operating data.
   8. Fan cfm, rpm, operating static pressures, driven and motor sheave data, and all drive changes necessitated to obtain design capacities. List actual minimum outside air volumes measured for each system.
   9. Type and size of filters installed in each filter bank.
   10. All supply, return and exhaust air outlet cfm readings.

1.04 DETAILED REQUIREMENTS

A. Adjusting and Balancing:
   1. Prior to beginning the balancing work, obtain from the Architect the latest version of the mechanical drawings including addenda, revisions, change orders, etc.
   2. Adjust and balance all portions of the mechanical systems to produce indicated results within limits of minus 5 or plus 10 percent or as subsequently directed by the [Architect].
   3. Balancing data may be spot checked with instruments similar to that used by the balancing firm.
   4. If, in the judgment of the [Architect], the discrepancies warrant additional adjustment, readjust and rebalance the systems at no additional project cost.
   5. Set outside air intake dampers to modulate between min occupancy setting and max occupancy setting (as specified on drawings) as CO2 levels rise from minimum set point to maximum set point (as specified on drawings).
SECTION 23 0700
HVAC INSULATION

PART 1 GENERAL

1.01 DESCRIPTION
A. The requirements of this section apply to the insulation of mechanical equipment specified elsewhere in these specifications.
B. Related Work: The requirements of Section 23 0500, Common HVAC Materials and Methods, also apply to this section.

1.02 QUALITY ASSURANCE
B. Composite (Insulation, Jacket or Facing and Adhesives) Fire and Smoke Hazard Ratings: Not to exceed a flame spread of 25 or smoke development of 50 and containing less than 0.1% by weight deca-PDE fire retardant.
C. Component Ratings of Accessories (Adhesives, Mastics, Cements, Tapes, Finishing Cloth for Fittings): Same as "B" requirements above and permanently treated. No water soluble treatments.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING
A. General: In addition to the requirements specified in Section 23 0500, the following apply:
   1. Deliver insulation, coverings, cements, adhesives and coatings to the site in factory-fabricated containers with the manufacturer's stamp or label affixed showing fire hazard ratings of the products. Store insulation in original wrappings and protect from weather and construction traffic.
   2. Protect insulation against dirt, water, chemical and mechanical damage. Do not install damaged insulation. Remove such insulation from project site.

1.04 SUBMITTALS
A. Submit catalog data and performance characteristics for each product specified.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS
A. Insulating Manufacturers: Johns Manville, Knauf, Armstrong, Owens-Corning, Pittsburgh Corning, Pabco, Imcoa, Nomaco, or Certain Teed. Johns Manville products are listed unless indicated otherwise.
B. Adhesive Manufacturers: Foster, 3M, Insul-Coustitc, Borden, Kingco or Armstrong.

2.02 PIPING INSULATION
A. Pipe Temperatures Minus 30 to 180 Deg. F: Flexible, preformed, pre-slit, self-sealing elastomeric pipe insulation, thermal conductivity of 0.27 BTU/hr. sq. ft./in. at 75 deg. F and vapor transmission rating of 0.2 perms/inch. Armstrong "Armaflex 2000" or, in concealed locations, Imcoa or Nomaco also approved.
2.03 DUCT INSULATION

A. Interior Above Grade Ductwork: Glass fiber formaldehyde-free blanket with "FSK" facing containing less than 0.1% by weight deca-PDE fire retardant, k value = 0.31 at 75 deg. F, 0.2 perms, and UL 25/50 surface burning rating. Johns Manville "Microlite."

2.04 INSULATION ACCESSORIES

A. Insulation Compounds and Materials: Provide rivets, staples, bands, adhesives, cements, coatings, sealers, welded studs, etc., as recommended by the manufacturers for the insulation and conditions specified except staples not permitted on chilled water lines.

PART 3 EXECUTION

3.01 PIPING INSULATION

A. Refrigerant Piping Insulation: Insulate suction piping with minimum 1" thick foamed plastic or of thickness necessary to prevent condensation at 85 deg. F and 70% RH. Where possible, slip insulation over the piping as it is installed. Seal all joint and seams.

B. Piping Insulation Lap Seams and Butt Joints: Install insulation in accordance with manufacturer’s recommendation. Where seams have not adhered, remove affected section of insulation and reinstall or apply sealing adhesive in accordance with manufacturer's instructions.

3.02 DUCTWORK INSULATION

A. Ductwork: Insulate the following:
   1. All supply ductwork.
   2. All supply and return ductwork in systems routed in unconditioned spaces or exposed to the outside conditions.
   3. All outside air intake ducts.
   4. All ductwork required to be insulated by code.

B. Insulation Thickness: Select board and blanket insulation of thickness required to provide the following installed R-value.
   1. All heating or cooling system supply and return ducts located on the exterior of the insulated building envelope, including ventilated attics, and all outside air intake ducts, R-8.
   2. All heating and cooling system supply and return ducts located in unconditioned spaces within the building insulation envelope, R-5.
   3. All heating and cooling system supply ducts located in conditioned spaces and where exposed in unfinished spaces or concealed from view in finished spaces, R-3.3. Exposed ductwork in finished spaces shall not be externally insulated.

C. Fittings: Install with wire, straps, and duct adhesive as required. To prevent sagging on all rectangular or square ducts over 24” wide, install Gramweld or equal welding pins on the bottom. Maximum spacing 18” on center in both directions.

D. Installation: Applied with butt joints, all seams sealed with vapor seal mastic or taped with 2” wide vapor-proof, pressure-sensitive tape. Seal all penetrations with vapor barrier adhesive.

E. Internally Lined Ductwork: Where internally lined ductwork is indicated on the Drawings and/or specified, no exterior insulation is required. Select duct lining to provide the required R-value. Carefully lap the ends of the exterior insulation a minimum of 6” past the interior insulation unless otherwise shown. Seal the end of vapor barrier jacket to the duct with mastic where the vapor barrier is required. Duct lining is specified in Section 23 3000.

END OF SECTION
SECTION 23 3000
AIR DISTRIBUTION

PART 1 GENERAL

1.01 DESCRIPTION
A. Provide Air Distribution Materials as specified herein and as shown on the Drawings.
B. Material characteristics and size shall be as indicated on the Drawings.
C. Related Work: The requirements of Section 23 0500, Common HVAC Materials and Methods, also apply to this section.

1.02 QUALITY ASSURANCE
A. Air Distribution Equipment Rating: In accordance with AMCA certified rating procedures and bearing the AMCA label.

1.03 SUBMITTALS
A. Submit catalog data, construction details and performance characteristics for all manufactured materials.
B. Submit operating and maintenance data.

PART 2 PRODUCTS

2.01 SHEET METAL
A. Sheet Metal Materials:
   1. General Material Requirements: Comply with the Mechanical Code and SMACNA’S “HVAC Duct Construction. Standards – Metal and Flexible, Third Edition” for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other perfections.
   2. All interior ducts shall be constructed with G-60 or better galvanized steel conforming to ASTM A653/A653M and A924/A924M Standards, LFQ, chem. treat. Exterior ductwork or duct exposed to high humidity conditions (that is: kitchen exhausts, etc.) shall be G-90 or better galvanized steel, conforming to ASTM A653/A653M and A924/A924M Standards, LFQ, chem. treat.

B. Duct Fabrication requirements: Metal gauges, joints and reinforcement in accordance with Mechanical Code, ASHRAE and SMACNA standards. Ductwork shall be fabricated to the following pressure classifications:
   1. Return and exhaust ducts: 1” negative.
   2. Supply ducts from fan discharge to diffuser: 1” positive.

C. Acoustical Duct and Plenum Lining: Flexible or rigid duct liner composed of resin bonded glass fibers. Greenguard® certified. Maximum thermal conductivity of 0.25 at 75°F. Johns Manville, Owens Corning, Knauf, and Certainteed approved, meeting NFPA 90A requirements for maximum flame spread and smoke developed and containing less than 0.1% by weight deca-PDE fire retardant.

D. Duct Tapes, Sealants, Adhesives & Gaskets:
   1. Joint & Seam Sealants (Water Based): Flexible, adhesive sealant, resistant to UV light when cured, UL 723 listed, and complying with NFPA requirements for Class 1 ducts.
   2. Liner Adhesive: Water based, fire and moisture resistant, used to adhere insulation to metal duct. It shall comply with NFPA 90A and UL 723 requirements.
   3. Duct Liner Sealant: Water based sealant, fire and moisture resistant, used to encapsulate fiberglass duct insulation to eliminate airborne fibers. Must comply with UL requirements.
E. **Optional Duct Joints for Sheet Metal Ducts:** Prefabricated slide-on transverse duct connectors will be accepted. Duct constructed using prefabricated connection systems will refer to the manufacturer guidelines for sheet gage, intermediate reinforcement size and spacing, and proper joint reinforcements. "Ductmate System" by Ductmate Industries, Inc., Ward Duct Connectors, Inc., Mez Industries, Elgen, or acceptable substitute. Spiramir self-sealing round duct connector system meeting Class 3 leakage standards with EPDM o-ring seal.

F. **Concealed Round Duct:** Round and flat oval spiral seam duct shall be manufactured of galvanized sheet metal with spiral lock seam. Construction, gauges, and reinforcement in accordance with SMACNA standards. Fittings shall be manufactured of galvanized steel with spot welded or riveted and sealed seams or continuously welded seams. Snap lock longitudinal seam duct shall fully comply with SMACNA standards for duct gauge and seam type for appropriate pressure class. Adjustable elbows are prohibited.

G. **Flexible Ductwork-Low Pressure:** Insulated low pressure flexible duct, factory fabricated assembly consisting of a zinc-coated spring steel helix seamless inner liner, wrapped with a nominal 1" thick insulation for installation inside the building insulation envelope, and 1-1/2" for installation outside the building insulation envelope. 1 pound/cubic foot density fiberglass insulation. The assembly shall be sheathed in a vapor barrier jacket, factory vapor resistance sealed at both ends of each section. The composite assembly, including insulation and vapor barrier, shall meet the Class 1 requirements of NFPA Bulletin No. 90-A and be labeled by Underwriters Laboratories, Inc., with a flame spread rating of 25 or less and a smoke developed rating of 50 or under. The duct shall have factory sealed double air seal (interior and exterior) to assure an airtight installation. Genflex, ATCO, Wiremold, Thermaflex, Glassflex, Clevepak, Schuller, or accepted substitute.

2.02 **ACCESSORIES**

A. **Manual Volume Dampers:** Construct of material two gauges heavier than duct in which installed; single plate up to 12" wide; multiple over 12" wide. Hem both edges 1/2" and flange sides 1/2". Use Young, Duro-Dyne, Elgen, MAT, Pottoroff or accepted substitute damper accessories. Young numbers are shown.
   1. No. 605 bearing set with No. 403 regulator for dampers up to 24" long.
   2. For dampers over 24" long use No. 660 3/8" rod, No. 656 end bearing and No. 403 regulator.
   3. Where damper regulators are not readily accessible, use No. 660 or No. 661 rod extensions and No. 301 and No. 315 concealed damper regulators or MAT cable operated dampers as required.

Location of all volume dampers is not necessarily shown on Drawings; minimum required is one in each supply, return or exhaust main, and one in each branch.

B. **Exterior Wall Louvers:** Prefabricated extruded aluminum stormproof blades with frame to suit building construction. 1/2", 16 gauge aluminum wire mesh on back side of all intake louvers and insect screen on exhaust/relief louvers. 4" deep, 37½ degree fixed drainable type blade, AMCA 500 tested for 600 fpm without water penetration, and maximum of 0.07" wg intake pressure loss and 0.09" wg exhaust pressure loss. Provide clear anodize finish. Ruskin ELF375D as basic pattern on blade and frame, Greenheck, Cesco, Pottorff, or approved.

C. **Locking Connection Straps:** 1/2" wide positive locking steel straps or nylon self-locking straps. Panduit, Elgen, or accepted substitute.

D. **Access Doors In Sheet Metal Work:**
   1. Hollow core double construction of same or heavier gauge material as duct in which installed. Use no door smaller than 12" by 12" for simple manual access or smaller than 18" by 24" where personnel must pass through infrequently. Use 24" by 60" minimum for filters and more frequent maintenance. Use indicated Ventlok hinges and latches or equivalent Elgen on all doors.
      a. 100 series hinges and latches on low pressure system doors up to 18" maximum dimension.
      b. 200 series on larger low pressure system doors and 333 series on high pressure systems.
2. Construct doors up to 18” maximum dimension with 1” overlap, fur and gasket with 3/4” by 1/8” sponge rubber. Fit larger doors against 1-1/2” by 1/8” or angle frame and gasket with 3/4” by 1/8” sponge rubber or felt.

E. Control Dampers: Construct of aluminum frame and aluminum airfoil blades with axle shafts and/or operating “jackshafts” with interconnecting blade linkages in the side channels of the frame to provide coordinate tracking of all blades. Interlocking multi-blade type, except where either dimension is less than 6”, a single blade may be used. Opposed blade type on all modulating dampers and parallel blades on all two position dampers. Provide with stainless steel, silicone, or vinyl jamb seal and vinyl or silicone blade seals. Damper assembly rated for maximum air leakage of 3 CFM per square foot at 1” wg pressure or less and with interconnecting blade linkages in the side channels of the frame. Performance rating for the damper shall be tested under the AMCA Certified Ratings Program. Greenheck VCD-40, Ruskin CD 50 or TAMCO Series 1000.

F. Turning Vanes:
   1. General Requirements: Comply with SMACNA’S “HVAC Duct Construction Standards-Metal and Flexible”; Figure 4-3 “Vanes and Vane Runners” and Figure 4-4 “Vane Support in Elbows”.
   2. Turning Vanes shall be 2” or 4” double wall fabricated from the same material as the duct. Mounting rails shall have insert tabs that align the vanes automatically.
   3. Acoustical Turning Vane: Shall be used in applications that require quiet operating systems. Mounting rails shall have insert tabs that align the vanes automatically.

G. Flexible Connections: Flexible duct connectors shall be used to isolate vibrations and noises that may be transmitted by fans or blowers to ductwork. The flexible duct connector is an air-tight and water proof flexible connection. Connectors will comply with NFPA 90A and NFPA 90B. Ventglass, Duro-Dyne, Elgen, or accepted substitute.
   1. Indoor Flexible Connector Fabrics:
      a. Fire Retardant Neoprene coated Fiberglass resistant to chemicals, gasoline and grease:
         1) Meets NFPA 701
         2) Minimum Weight: 32 oz/sq.yd.
         3) Tensile Strength: 500 lbs in the warp and 500 lbs in the filling
         4) Service Temperature: -40 to 200 deg F
      b. Fire Retardant Neoprene coated Fiberglass for high pressure applications and large ducts:
         1) Meets NFPA 701
         2) Minimum Weight: 40 oz/sq.yd.
         3) Tensile Strength: 630 lbs in the warp and 465 lbs in the filling
         4) Service Temperature: 285 deg F

2.03 GRILLES, REGISTERS AND DIFFUSERS

A. Description: Provide grilles, registers and diffusers as shown on the Drawings.

B. Finishes:
   1. Steel: Flat white enamel prime coat, factory applied on ceiling diffusers. Others are to have a baked enamel finish, color as selected by Architect.
   2. Aluminum: Anodized clear finish unless indicated otherwise.

C. Manufacturers: Carnes, Krueger, Titus, Price, and Tuttle & Bailey are accepted substitutes where only Titus model numbers are listed. Where other manufacturer’s products are listed and/or “accepted substitute” is indicated, only the products or an accepted substitute for that item shall be provided.

D. Perforated Face Diffusers: Perforated snap-in or concealed hinged face plate with internal deflection blades at diffuser neck in steel or extruded aluminum frame and margin to suit the ceiling construction. Provide with opposed blade volume damper. Panel size shall be 24” x 24” where lift-out tile ceiling system is indicated. Titus PCS.

E. Ceiling Matched Return and/or Exhaust Register: To match adjacent ceiling outlets. Use in spaces containing ceiling diffusers and/or T-bar ceilings. Provide with damper except where dampered plenums are indicated. Match manufacturer of supply.
F. Sidewall Supply Grille or Register: Double deflection grille with face bars parallel to long dimension on ceiling type and horizontal on wall type; bars to be individually adjustable, spaced on 0.66" to 0.75" centers; key operated opposed blade volume damper. Titus 300RL.

PART 3 EXECUTION

3.01 EQUIPMENT INSTALLATION

A. Air Handling Equipment Installation and Arrangement: Install and arrange as shown on Drawings. Comply with the manufacturer's recommendations for installation, connection, and start-up.

B. Equipment Access Panels: Locate free of all obstructions such as ceiling bars, electrical conduit, lights, ductwork, etc.

3.02 INSTALLATION OF GRILLES, REGISTERS AND DIFFUSERS

A. Size and air handling characteristics shall be as shown on the Drawings.

B. Locate, arrange, and install grilles, registers and diffusers as shown on the Drawings. Locate registers in tee-bar ceilings with diffusers centered on the tile unless indicated otherwise.

3.03 DUCTWORK INSTALLATION

A. Delivery, Storage and Handling:
   1. Protect shop fabricated and factory fabricated ductwork, accessories and purchased products from damage during shipping, storage and handling. Prevent end damage and prevent dirt and moisture from entering ducts and fittings with a polyethylene film with a high-tack pressure sensitive adhesive to attach to the ductwork and accessories.
   2. Where possible, store ductwork inside and protect from weather. Where necessary to store outside, store above grade and enclose with a polyethylene film with a high-tack pressure sensitive waterproof wrapping.

B. Support: Install ductwork with 1" wide strap cradle hangers not more than 8' on centers or as required by code. Support terminal units independent of adjacent ductwork. Attach to available building construction according to good practices for materials involved. Manufactured hanger system acceptable in lieu of fabricated hangers at contractors option. Ductmate “Clutcher” system or approved.

C. Fan and Air Handling Unit Flexible Connections: Install flexible connections in ductwork at all rotating equipment.

D. Elbows and Fittings: Construct elbows with throat radius equal to duct width in plane of turn or make them square and provide double wall, air foil turning vanes.

E. Fittings: Make transitions and take-offs as shown on Drawings. Provide volume dampers and splitter dampers as indicated on Drawings and as specified. Saddle tees are not allowed.

F. Acoustical Duct Lining: Acoustically line all fan unit intake and discharge plenums, all ductwork indicated as lined on the Drawings, all sheet metal ductwork specified per Section 23 0700 as insulated, where exposed to view or subject to damage in areas such as mechanical rooms, and, at the Contractor's option, all insulated ductwork specified in Section 23 0700. Line ducts with 1" thick lining for installation inside the building insulation envelope, and 1-1/2" for installation outside the building insulation envelope. Mechanically attach lining to sheet metal duct with Grip Nails or welding pins. Apply fire-retardant type water based adhesive on all leading edges, joints and seams. The duct size noted on the Drawings is the clear opening of the duct with lining. Insulation shall not reduce duct size listed.
G. Manual Volume Dampers: Location of all volume dampers are not necessarily shown on the Drawings. Provide a minimum of one volume damper in each supply, return or exhaust branch. Install dampers in fiberglass ductwork (where fiberglass ductwork is allowed) with galvanized sheet metal sleeves of sheet metal gauges required for metal duct systems of the same dimensions.

H. Duct Insulation: Specified in Section 23 0700.

I. Access: Install necessary access opening and covers for cleaning, wiring or servicing motors, filters, fans, both entering and leaving air sides of coils, fire and/or smoke dampers and to other equipment located within or blocked by sheet metal work.

J. Sealing: Caulk, seal, grout and/or tape ductwork and plenums to make airtight at seams, joints, edges, corners and at penetrations.

K. Flexible Duct Connections:
   1. Install in full extended condition, free of sags and kinks, using only the minimum length required to make the connection.
   2. Make all joints and connections with 1/2" wide positive locking steel straps or nylon self-locking straps and make connections to non-metallic ducts with sheet metal sleeves or manufactured sheet metal "spin-in" fittings.
   3. On vertically suspended ducts, secure with a minimum of three sheet metal screws on a maximum of 8" on center.

3.04 NEW DUCTWORK CLEANING

A. Store all ductwork materials on pallets or above grade, protected from weather, dirt/mud and other construction dust.

B. Remove all accumulated dust, dirt, etc. from each duct section as it is being installed.

C. Prior to installation of diffusers, grilles and registers, install temporary system filters and cover all diffuser, grille and register openings with temporary 25% efficiency filter materials and start the fan systems. Operate fans a minimum of 8 hours. Remove all temporary filters at the end of that period.

D. Clean all diffusers, grilles and registers just prior to project final completion.

3.05 EXISTING DUCT CLEANING

A. Power vacuum and air wash with compressed air the interior of the existing supply and exhaust ductwork, as noted on the Drawings, from the connection with new ductwork to the termination point at the supply or exhaust register. Ductwork cleaning shall be done by a subcontractor who is regularly engaged in this work. Powermaster or accepted substitute.

END OF SECTION
SECTION 23 3400
HVAC FANS

PART 1 GENERAL

1.01 DESCRIPTION
A. Provide Fans as specified herein and shown on the Drawings.
B. Equipment capacity and size as indicated in the equipment lists on the Drawings.
C. Related Work: The requirements of Section 23 05 00, Common HVAC Materials and Methods, also apply to this section.

1.02 QUALITY ASSURANCE
A. Air Handling Equipment: Rated in accordance with AMCA certified rating procedures and AMCA labeled.

1.03 SUBMITTALS
A. Submit catalog data, construction details and performance characteristics for each fan.
B. Submit operating and maintenance data.

PART 2 PRODUCTS

2.01 EXHAUST FANS AND UNITS
A. Ceiling Cabinet Exhaust Fan: Direct drive, forward curved centrifugal wheel, sleeve bearings, motor and wheel isolated from unit on vibration isolators; provide metal grille on inlet and duct connection with backdraft dampers on discharge. Size and capacity as indicated on Drawings. Provide with speed control. Carnes VCD, Acme V, PennBarry Zypher, Jenn-Air J-Series, Greenheck CSP, Soler & Palau SV, Jen Fan FF, Cook Gemini, Twin City T or approved.
B. Roof Mounted Exhaust Fan (Direct Drive): Curb mounted on roof; vertical shaft, direct driven, open BI wheel as shown on Drawings with permanently lubricated sealed ball bearings; fan duty motor; bird screen; weatherproof aluminum housing for mounting on square base; capacity as indicated on Drawings. Motor located outside the air stream. Casing to be easily removed for service. Motor and fan assembly to be mounted on rubber vibration isolators. Where indicated on the Drawings, provide motorized Class 1 damper in curb. Provide switch with pilot light for each fan so indicated. Provide factory mounted disconnect. Provide with 0-10 VDC signal input for varigreen motor speed control to maintain space temp. See schedule for temp setting. Greenheck G, Soler & Palau RED, Jen Fan RED, Carnes VEDK, Acme PRN, PennBarry DOMEX, Cook ACE-D, Twin City DCRD, Captiveaire DR, or approved.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install and arrange equipment as shown on the Drawings and as recommended by the equipment manufacturer.

3.02 AIR HANDLING INSTALLATION
A. Installation and Arrangement: Air handling equipment shall be installed and arranged as shown on the Drawings. Comply with the manufacturer's recommendations for installation connection and start-up.
B. Lubrication: All moving and rotating parts shall be lubricated in accordance with the manufacturer's recommendations prior to start-up.
C. Filters: Specified filters or approved temporary construction filters shall be installed in supply units prior to start-up or used for drying and/or temporary heat.

3.03 CONTROLS

A. Wiring: All wiring shall be in accordance with the National Electrical Code and local electrical codes.

END OF SECTION
SECTION 23 7400
PACKAGED HVAC UNITS

PART 1   GENERAL
1.01   DESCRIPTION
   A. Provide Heating, Cooling, and Ventilating Equipment as specified herein and shown on the Drawings.
   B. Equipment capacity and size shall be as indicated on the Drawings.
   C. Related Work: The requirements of Section 23 0500, Common HVAC Materials and Methods, also apply to this section.

1.02   QUALITY ASSURANCE
   A. Air Handling Equipment: Rated in accordance with AMCA certified rating procedures and AMCA labeled.
   B. Air Conditioning and Refrigeration Equipment Rating: Rated in accordance with ARI certified rating procedures and ARI labeled.

1.03   SUBMITTALS
   A. Submit catalog data, construction details and performance characteristics for each HVAC unit.
   B. Submit operating and maintenance data.

PART 2   PRODUCTS
2.01   HVAC UNITS
   A. Air-To-Air, Electric Roof-Mounted Heat Pumps:
      1. Acceptable Manufacturers: Carrier, McQuay, Trane, York, or approved.
      2. Size and capacity as shown on the Drawings.
      3. Coils shall be constructed of aluminum plate fins mechanically bonded to non-ferrous tubing with all joints brazed. Supply fan shall be centrifugal type, direct or belt driven by a permanent lubricated motor.
      4. Unit shall include hermetically sealed compressor with automatically reversible oil pump, internal or external motor protection. Outdoor fans shall be vertical discharge propeller type, direct driven by permanently lubricated motor. Include electric resistant heat section and 1" throw-away type air filters. Controls and devices shall include a high pressure stat, two low pressure stats, crankcase heater, suction line accumulator, pressure relief device, a positive acting timer to prevent compressor short cycling and to prevent compressor from restarting for a five-minute period if power is interrupted, and an automatic defrost control to accomplish defrosting (only if required) every 90 minutes for a period of not more than 10 minutes.
      5. Mount unit on leveled factory furnished steel support curb with ductwork and electrical connections brought up through the roof within the curb.
      6. Controls: Heat pump manufacturer shall provide factory installed and wired controls including control circuit transformers, relays, all necessary internal circuiting and fused disconnects for a single field electrical power connection, switches, controllers and thermostats requiring only field mounting of thermostats and low voltage wiring from thermostats to unit to place in operation. Arrange controls to operate the supply fans from programmable 7-day night set back thermostat. Cycle heating and cooling from room thermostats to maintain space temperature. Unit shall have one stage of cooling and three stages of heat (one heat pump cycle and two electric resistance) and also have an outdoor thermostat lock-out to prevent operation of the second stage of electric resistance heat above 35 degrees F (Unit shall have one stage of cooling and two stages of heat, one heat pump and one electric resistance).
PART 3  EXECUTION

3.01  INSTALLATION

A. Install and arrange equipment as shown on the Drawings and as recommended by the equipment manufacturer.

B. Piping: Refer to applicable sections for piping, ductwork, insulation, painting, etc.

3.02  AIR HANDLING INSTALLATION

A. Installation and Arrangement: Air handling equipment shall be installed and arranged as shown on the Drawings. Comply with the manufacturer's recommendations for installation, connection, and start-up.

B. Lubrication: All moving and rotating parts shall be lubricated in accordance with the manufacturer's recommendations prior to start-up.

C. Filters: Specified filters or approved temporary construction filters shall be installed in supply units prior to start-up or used for drying and/or temporary heat.

3.03  SMOKE DETECTOR INSTALLATION

A. Provide duct-mounted smoke detectors at air handling units in accordance with Code requirements.

B. Where detectors are mounted in a concealed location, provide remote indicating panel located as directed.

C. Automatic Smoke Detector Fan Shutdown: Coordinate with Automatic Temperature Controls specified elsewhere in these specifications.

3.04  CONTROLS

A. Wiring: All wiring shall be in accordance with the National Electrical Code and local electrical codes.

B. Mounting: All controls intended to be operable by the occupants shall be mounted with the operating portion no more than 46” above the floor or as otherwise required by applicable codes.

END OF SECTION
SECTION 26 0500
BASIC ELECTRICAL MATERIALS & METHODS

PART 1 - GENERAL

1.01 Description

A. Furnish labor, supervision, permits, materials and equipment to complete the work required in Division 26 and by the contract documents.

B. It is the intention of this Section of the Specifications and the accompanying drawings to describe and provide for the furnishing, installing, testing and placing in satisfactory and successful operation all equipment, materials, devices and necessary appurtenances to provide a complete electrical system, together with such other miscellaneous installations and equipment hereinafter specified and/or shown on the Plans.

1.02 Contract Documents

A. The Contract Documents are complimentary, and what one affecting this Division requires shall be binding as if repeated herein.

B. Separation of this Division from other Contract Documents shall not be construed as complete segregation of the work.

C. Electrical work shall include both this Division as well as other Divisions as applicable, such as:
   1. Division 27, Communications
   2. Division 28, Safety & Security
   3. Division 33, Utilities.

1.03 Codes


B. Code requirements shall be considered a minimum guide for the work. Where contract documents require work materials in excess of Code minimum, install work as called for in contract documents.
1.04 Permits, Licenses And Taxes

A. The Contractor shall obtain and pay for all licenses, permits and inspections required by laws, ordinances and rules governing work specified herein. The Contractor shall arrange for inspection of work by the inspectors and shall give the inspectors all necessary assistance in their work of inspection. Division 26 Contractor shall make all necessary arrangements for installation of electrical services indicated on plans.

B. Utility installation fees will be paid by the Owner.

1.05 Layout And Coordination

A. See General Conditions.

B. Before starting work, carefully examine Architectural, Civil, Landscape, Structural, Plumbing, Heating, Ventilating and Air Conditioning Drawings to become thoroughly familiar with conditions governing work on this project. Verify elevations, measurements, rough-in requirements of equipment and its installation location before proceeding with the work. Install equipment with access as required by NEC.

C. Prior Installation. Any electrical work installed prior to approval of coordination drawings shall be at the Contractor's risk. Subsequent relocations required to avoid interferences shall be made without additional expense to the Owner. In case interference develops, the Engineer will decide which work shall be relocated, regardless of which was installed first.

D. The existence of any wires, conduits, pipes, ducts or other service facilities is shown in a general way only. The Contractor is responsible for making the exact determination of the location and condition of these facilities.

E. The Drawings indicate outlet and equipment locations, directions and locations of branch circuit wiring and homeruns. Verify all locations with actual field conditions.

F. The horsepower of motors and apparatus wattages indicated on the plans and in the panel schedules are estimated requirements of equipment furnished under other Divisions of this contract and bid shall be based on these sizes. Overload elements, contactors, circuit breakers, fuses, conductors, etc., shall be furnished to suit actual equipment installed. Advise Engineer of any equipment changes affecting electrical circuits.

G. The location of utilities indicated on the plans is taken from existing public records. The Contractor must determine the exact location and elevation of public utilities. The Contractor shall ascertain whether any additional facilities other than those shown on the Drawings may be present.
H. The general directions and location of homeruns are indicated on Drawings and are to be extended to panels as though routes were completely shown. No homeruns or branch circuits are to be combined. Items which are installed other than as shown on Drawings and without receiving prior written approval will be ordered removed and installed as shown without additional cost to Owner.

I. Owner shall not be responsible for any loss of unanticipated costs that may be suffered by the successful bidder as a result of such bidder’s failure to fully inform himself in advance in regard to all conditions pertaining to the work and character of the work.

J. Coordinate work with other crafts employed on the project. Should rearrangement or relocation of equipment be necessary, provide for approval the simplest layout possible for that particular portion of the work. Under no condition are beams, girders, footing or columns to be cut for electrical items unless so shown on Plans or written approval is obtained from the Architect or Engineer.

K. Special attention shall be given for the following items and all conflicts shall be reported to the Engineer before installation for decision and correction:

1. Door swings; switches shall be located on the “strike” side of the door.

2. Location of radiators, grilles, pipes, ducts and other mechanical equipment so that all electrical outlets, lighting fixtures and other electrical outlets and equipment are clear from and in proper relation to these items.

3. Location of cabinets and counters so that electrical outlets and equipment are clear from and in proper relation to these items.

4. Within the limits indicated on the drawings, the maximum practicable space for operation, repair, removal and testing of equipment shall be provided.

5. Contractor shall coordinate with HVAC installer (if separate from the Contractor) to wire the HVAC system when the installer is ready for power.

L. Contractor shall consult the Architectural drawings for the exact height and/or location of all outlets, switches, lights, etc. specified herein or on the drawings.

M. Outlet locations shown on the drawings are approximate. Contractor shall study the building drawings in relation to spaces and equipment surrounding each outlet so that the lighting fixtures are symmetrically located according to ceiling tile and room layout. When necessary, with the Engineer's approval, outlet shall be relocated to avoid interference with structural features of the building.

N. Call to the attention of the Architect any error, conflict or discrepancy in Plans and/or Specifications. Do not proceed with any questionable items of work until clarification of same has been made.
O. Supplementary Details and Plans may be supplied as required and they will become a part of the Contract Documents. The Architect or Engineer reserves the right to make minor changes prior to installation of specific electrical systems in the location of the conduits, outlets, etc., from those shown on the plans without extra charge to the Owner.

P. Arrange work to reduce interruption of any existing service to minimum. When interruptions are unavoidable, consult Owner or Utility involved and agree in writing, with copy to the Architect, upon a mutually satisfactory time and duration.

1.06 Substitution Requests

A. Substitution of Equipment. (Prior To Bid).

1. Bids shall be based only upon the materials, construction and equipment specifically identified in the bidding documents, except as hereinafter provided.

2. If Contractors wish to use items of equipment other than those named in their base bid, Contractor shall apply in writing to the Engineer for approval of substitution at least 10 days prior to opening of bids, submitting with his request for approval complete descriptive and technical data on the items he proposes to furnish.

3. Equipment and materials proposed for substitution shall be similar in design and equal in quality and function to those specified.

4. Submittal shall be in triplicate with identification of the item to be substituted and clearly marked with all pertinent data depicting proper characteristics of proposed item.

5. Contractor's description of his proposed substitution shall specifically note all differences between the item specified and the proposed substitution.

6. If the Engineer approves any proposed substitution, such approval will be set forth in an Addendum or in writing to the person submitting equipment for approval.

7. Where a substitution alters the design or space requirements indicated, Contractor shall include all items of cost for the revised design and construction including cost of all allied trades.

8. Unless requests for changes in base bid specifications are received and approved prior to the opening of bids, as defined above, the successful Contractor will be held to furnish specified items under his base bid. After Contract is awarded, changes in specifications will be made only as defined under Substitution of Equipment. (After bid).

B. Substitution of Equipment or Materials. (After Bid).
1. After execution of the Contract, substitution of equipment or makes other than those specifically named in the Contract Documents will be approved by the Engineer for the following reasons only:

2. That the equipment proposed for substitution is equal to and/or superior to equipment named, in construction, efficiency and utility, and further that the equipment named in the specifications cannot be delivered to the job in time to complete the work in proper sequence to work of other Contractors, due to conditions beyond the control of the Contractor.

3. To receive consideration, requests for substitutions must be accompanied by documentary proof of equality or difference in price and delivery, if any, in the form of certified quotations from suppliers of both specified and proposed equipment.

4. In case of a difference in price, the Owner shall receive all benefit of the difference in cost involved in any substitution and the Contract altered by Change Order to credit Owner with any savings so obtained.

1.07 Submittals: Shop Drawings And Material Lists

A. In addition to the requirements of General Conditions of Division 01, submit manufacturers data and Shop Drawings and Material Lists as required by individual sections of Division 26 (and otherwise associated Divisions).

B. Before commencing work and within 30 days after award of contract, furnish six (6) copies of complete Shop Drawings and Material Lists to the Architect or Engineer.

C. Include only information on exact equipment installed; not complete "line" of manufacturer. Where sheets show proposed equipment as well as other equipment, identify proposed equipment with black arrow, underlining or circling. Contractor is not to use red. Diagrams for systems to be complete Drawings for specific system installed. "Typical" line diagrams not acceptable unless properly marked to indicate exact system for this project.

D. Single Submission. Data and shop drawings shall be supported and included in a single submission. Multiple submissions are not acceptable except where prior approval has been obtained from the Engineer. In such cases, a list of data to be submitted later shall be included with the first submission.

E. Shop Drawings. Shop drawings shall include complete construction details, dimensions, material descriptions, diagrams or pictures showing physical characteristics, performance and test data, description of operation, installation methods, wiring diagrams and any other data or information necessary for a complete evaluation. (Note: do not re-draw the contract drawings. The drawings to be submitted under this subsection are all the supplemental drawings and manufacturers' specification drawings which are not included in the contract drawings.) Shop drawings are in addition and supplemental to the contract drawings.
F. Identification. In addition to the requirements of Special Provisions, submittals shall be identified by the name of the system and applicable specification paragraph number.

G. Delivery Prior to Approval. No item of material or equipment shall be delivered to the site or installed, until approved. After the proposed materials have been approved, no substitution will be permitted except where approved by the Engineer.

H. Compliance. Should the Contractor fail to comply with the requirements of these provisions, the Engineer reserves the right to select any or all items of materials and systems. Selection shall be final and binding upon the Contractor. Materials so selected or approved shall be used in the work at no additional cost to the Owner.

I. Departures. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore, shall be submitted with the drawings. Where such departures require raceways or equipment to be supported otherwise than as shown, the details submitted shall include loadings and type and kind of frames, brackets, stanchions, or other supports necessary. Approved departures shall be made at no additional cost to the Owner.

J. Electrical Diagrams. A complete electrical connection diagram for each item of equipment furnished under Division 26, which has electrically controlled components having more than one automatic or manual control device, shall be submitted for approval. Wiring diagrams shall identify each component, and one diagram shall show all interconnected or interlocked components. It is understood that the contract electrical drawings do not have to be submitted or copied for inclusion in this submittal.

K. Contractor agrees that submittals processed by the Engineer are not change orders; that the purpose of submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use.

L. Late submittals will not be considered an excuse for time extension for the project.

M. Data not in conformity with these requirements will be returned for resubmittal.

N. Organization:
   1. Assemble Shop Drawings and submittal data in hard cover loose-leaf ring binder. Provide cover with permanently attached typewritten or printed
label with name of project, job number and heading reading "ELECTRICAL SUBMITTAL DATA".

2. Organize data in each set in basic categories listed in index for Division 26 (and otherwise associated Divisions). Provide submittal data with typewritten index having same sequence, numbering and wording as index for Division 26 (and otherwise associated Divisions). In addition, provide divider sheets between each section with identifying tabs having same designations as index. Organize material in each section in same order and identify with same number and wording as paragraphs of specification section.

3. Submit neat, clean copies of data, 8-1/2 inch by 11-inch size. Accordion fold required drawings to 8-1/2 inch by 11-inch size and include in submittal binder.

1.08 Electrical Equipment Operation and Maintenance Manuals

A. In addition to the requirements of the General Conditions of Division 01, submit manuals as required by individual Sections of Division 26 (and otherwise associated Divisions).

B. Provide all electrical equipment and control information. The purpose of this manual is to provide one comprehensive document that illustrates and describes all the electrical equipment and instrumentation installed in the plant.

C. For final acceptance of Division 26 work, provide to the Architect or Engineer six (6) copies of complete electrical operating and maintenance manuals for servicing of all equipment installed.

D. Information included must be exact equipment installed, not complete "line" of manufacturer. Where sheets show equipment installed as well as other equipment, identify installed equipment with black arrow, underlining or circling. Contractor is not to use red. Diagrams for each system to be complete Drawings for specific system installed. "Typical" line diagrams not acceptable unless properly marked to indicate exact system for this project.

E. Information shall include all revisions noted in shop drawings. Copies of stamped drawings are not acceptable.

F. Provide General Contractor’s name, contact person, telephone/fax numbers, include similar information for the sub-contractors.

G. Include all electrical devices provided under all Divisions. Coordinate with other Division Contractors. The Contractor shall coordinate with the Division 17 contractor and the Software Integrator to include pertinent documentation from their responsibilities in this submittal.
H. Manuals and documentation shall include calibration curves of every sensing device and a programming documentation sheet for every programmable device. The programming documentation sheet shall show the final operational value of every programmable parameter of every device. The purpose of this sheet is to provide maintenance personnel with a convenient source of information for programming the parameters of a replacement device should the old device fail.

I. Organization:

1. Assemble Shop Drawings and submittal data in hard cover loose-leaf ring binder. Contractor shall insert printed spine and cover title sheets to match font style and size of the rest of the plant O&M manual set. Coordinate with the General Contractor.

2. Organize data in each set in basic categories listed in index for Division 26. Provide submittal data with typewritten index having same sequence, numbering and wording as index for Division 26. In addition, provide divider sheets between each section with identifying tabs having same designations as index. Organize material in each section in same order and identify with same number and wording as paragraphs of specification section.

3. Submit neat, clean copies of data, 8-1/2 inch by 11-inch size. Accordion fold required drawings to 8-1/2 inch by 11-inch size and include in submittal binder.

1.09 Project Record Drawings

A. Maintain at the site one complete set of full-sized original prints for recording installed conditions (As-Builts). Keep record Drawings clean, undamaged and up to date as work progresses. Accurately indicate electrical work as actually installed with indications of all deviations, additions and omissions in red ink. Locate all buried exterior raceways or cables by actual dimensions from walls, center-lines or fixed points of reference.

B. The purpose of these Record drawings is to provide the Engineer with an easy to read, complete record of the installation so that at the end of the project the Engineer can revise the original contract drawings to represent the actual installation. Color-coded and highlighted notes shall be used if these would make the Record Drawings easier to read.

C. At the completion of the work, Contractor shall furnish the Engineer this original set of marked-up drawings. Final payment to the Contractor will not be authorized until these drawings have been submitted to and accepted by the Engineer.

1.10 Certificates

A. For final acceptance of Division 26 work (and that of otherwise associated Divisions), provide certificate of approval from the applicable regulatory and permit-
ting agencies certifying that the electrical work has been inspected and that the work conforms with the minimum requirements of the State Electrical Codes.

1.11 Warranty

A. See Division 01.

PART 2 - PRODUCTS

2.01 Materials

A. Unless otherwise specified, all material to be new of recent manufacture, carrying full factory warranty, UL approved or approved by local inspection authority.

B. All like materials shall be by the same manufacturer throughout the project.

C. All material shall be new and bear manufacturer’s name, model number, electrical characteristics and other identification and shall be the standard product of manufacturer regularly engaged in production of similar material.

D. Access Panels:

1. Provide access panels of adequate size for equipment requiring service and installed above plaster or gypsum board ceilings, behind walls or in furring.

2. Furnish complete with correct frame for type of building construction involved. Size, number and location of access panels is not necessarily shown on Drawings.

3. Use no panel smaller than 12 inches by 12 inches for simple manual access, nor smaller than 16 inches by 20 inches where personal must pass through.

4. Access panels shall maintain ceiling fire rating.

5. Acceptable Manufacturers: Milcor A, K, L, or M panels or equivalent Bilco or Potter - Roemer as required by construction.

PART 3 - EXECUTION

3.01 Excavation/Trenching

A. Provide trenching, backfilling, compaction, repaving or other site restoration as required by the work done in this Division.

B. Determine location of all existing underground gas, water, sewer, telephone and electric lines. Locate accurately on ground surface and for depth of same before excavation. Uncover by hand digging. Contractor shall be responsible for any
damage or interruptions to these utilities, caused by himself, and other costs incurred by these interruptions.

C. Do not undermine footings or bearing walls.

D. Use power-digging equipment only in direction away from existing facilities.

E. Exercise standard safety precautions in excavation near power cables by using insulated handles, rubber gloves and footwear, etc.

F. Do not place backfill until installation to be covered has been tested, inspected and approved.

G. Minimum conduit burial depth shall be 24 inches, unless otherwise noted.

H. Install a detectable six inch wide yellow vinyl tape with letter “Caution: Buried Electrical Line Below” 18 inches above all buried services conduit and wire not under structures.

I. Backfill:

1. Backfill material for all trenches under paved areas shall be coarse sand or crushed rock, installed in layers not to exceed six inches and compacted to 95% of maximum density at optimum moisture content to preclude subsequent settlement.

2. The top 18 inches of trenches in landscaped or grassed areas shall be backfilled with native soil and tamped.

J. Conduits piercing a building waterproof membrane shall be provided with flanges, using two neoprene washers, one washer on each side of membrane, between each flange and membrane.

K. All underground conduits which enter the building penetrating poured-in-place slabs:

1. Shall be sloped to drain away from the building and shall be water sealed to prevent moisture from passing through the conduit into the building. All joints to be threaded and taped or glued to prevent entry of water into the conduits.

2. Shall be poured-in-place, or provide with watertight conduit sleeves and rubber seals, Link-seal system by Thunderline Corporation or equivalent.

3. Shall be rigid galvanized steel a minimum of 12-inches under the slab and 6-inches above the slab.

3.02 Cutting

A. Perform or arrange and pay for required cutting of concrete, masonry, wood, structural framing, etc.
B. Cutting or channeling of underpinning or structural members is not permitted without prior permission of the Engineer.

C. No weakening of structural parts is permitted and the Contractor will correct any work impaired.

3.03 Patching

A. Where trenching is done through existing paving, walks, curbs, etc., the Contractor is responsible to patch and repair these structures to original condition.

B. Patch all openings in and through concrete and masonry with dry pack.

C. In new work, patch and refinish all finished surfaces damaged by this contractor to match adjacent surface.

D. Where new electrical work is installed in the existing building, patch and refinish surfaces damaged to match existing. Refinishing to be as directed by the Architect or Engineer.

3.04 Framing And Blocking

A. Structural framing will be done by the Contractor.

B. Blocking required for sole use of electrical work such as fastening and support of outlet boxes, fixtures, panels, conduit, etc., will be by the Electrical Contractor.

3.05 Housekeeping Pads

A. Provide concrete housekeeping pad under Motor Control Centers, transformers, pumps, or any floor mounted switchboard as outlined on drawings.

3.06 Protection

A. Cap or plug all raceway openings during construction.

B. Protect all completed work against dirt, water or chemical damage, mechanical accident or injury.

C. Equipment found damaged or in other than new condition will be rejected as defective.

3.07 Sleeves

A. Where conduit passes through masonry or concrete, install sleeves during construction of same.

B. Where conduit must by necessity pass through beams or columns, install sleeves located as directed by Engineer.
3.08 Identification

A. Label complete electrical system to indicated use of each item of equipment or load served.

B. Identification of Disconnecting Means: Provide identification of disconnects in accordance with Section 110-22 and Section 240-83 of the National Electrical Code.

C. Identification of Conductors and Components for Distribution Systems Operating at Two or More Different Voltages: Identify components in accordance with Section 210-4(d) of the National Electrical Code. Required labeling shall be by Micarta plate.

D. Emergency System: Identify all enclosures (including transfer switches, generators, and power panels) for emergency circuits by marking with red engraved permanently attached nameplates reading "Emergency Circuits" in accordance with Section 700-9(a) of the National Electrical Code. All boxes for emergency circuits may be identified by painting red.

E. Provide black laminated white core engraved nameplates with lettering not less than 3/16 inch high attached to the outside of junction boxes larger than 4-11/16 inch; surface mounted cabinets, panelboards, time switches; disconnect switches, starters, contactor, relays; subdistribution and branch circuit panelboards, dry transformers and other items indicating equipment or load served. At flush mounted cabinets, panelboards, time switches and similar items mount nameplate on inside of door at finished areas and on outside of door at mechanical, storage rooms and other non-public spaces. Attach nameplates with epoxy glue.

F. Flush mounted devices with stainless steel or plastic finish plates requiring identification to be engraved with lettering not less than 1/8 inch high with black color filling.

G. Provide typewritten circuit schedules for panelboards, cross-connect panels and terminal cabinets. Schedules shall be covered with minimum of 0.018 inch thick clear rigid plastic installed in permanently attached metal frame holder located on inside face of door. Schedules to use final assigned room names/numbers, loads not plan designations.

H. When making modifications to existing equipment or panelboards, provide labels as indicated in this section. Provide new typewritten circuit schedules for all modified panelboards.

I. At Main Distribution Panels provide black laminated white core engraved nameplates attached to panel exterior with epoxy glue. Size of nameplate and lettering as directed. Label distribution breakers, main breakers, sub-breakers and panel sections to identify all components and voltage and phase of system. In addition, provide master nameplate indicating project name, date, Architect (when applicable...
ble), Electrical Engineer, and Electrical Contractor. Lettering minimum of 1/4 inch high. Provide half-sized electrical one-line diagram (s) framed and mounted on wall near main distribution panel (s).

J. At buildings having multiple services provide additional engraved nameplate at each service indicating location of additional services.

3.09 Installation

A. Wiring Requirements: Install wiring complete to every outlet with all devices shown and/or required. All wiring to be in raceways and concealed throughout finished areas unless specifically noted otherwise. For the purpose of electrical specifications, all areas, with the exception of boiler rooms, mechanical rooms and mechanical spaces, are to be considered as finished areas.

B. Provide raceway connections between outlets, outlets and panels and equipment and panels as shown on Drawings. Size raceways according to governing codes unless otherwise noted.

C. Locations:

1. Verify all locations with actual field conditions, and plans to avert possible installation conflicts.

2. Coordinate work with that of other trades to assure symmetrical placing of fixtures in respect to ceiling tile, grilles, etc.

3. Cabinets: Where electrical outlets occur in face, decks or base of cabinets or in walls above counters, carefully coordinate with details and arrangements of same.

4. Any work, which is incorrectly installed without prior verification with General Contractor, Architect, Engineer and Drawings, will be ordered removed and relocated and any damage to other work shall be repaired at no cost to the Owner.

5. In general, locate outlets as indicated in symbol schedule on Drawings.

D. All mounting heights shown on drawings are from finish floor to centerline unless otherwise shown. Mounting heights at non-typical locations shown with (+) sign and height required noted adjacent to outlet. Outlets located in concrete block, brick or tile walls are to be adjusted in height to coordinate with modular joints of the materials.

3.10 Painting

A. Painting in general will be covered under another Division of this specification, except items furnished under this Division that are scratched or marred in shipment or installation and/or require custom painting.
B. Install equipment with manufacturer's standard finish and color unless otherwise specified. Refinish any marred or oxidized items restored to manufacturer's factory finish.

C. Required surfaces or equipment with no standard finish; clean off grease and scale. Restore to smooth finish. Give one coat of primer, two coats finish.

D. Paint and color as selected by Architect or Engineer.

E. All exposed conduits on painted walls shall be painted to match wall and trim colors. Conduit labels shall be neatly affixed and shall not be painted over.

F. All electrical equipment and conduit exposed in finished areas and on exterior walls shall be painted to match surrounding surfaces.

G. Contractor shall coordinate the timing of painting requirements.

H. Refer to architectural specifications for methods and materials.

3.11 Future Provisions

A. Provide pull line in each empty conduit provided for future installation of wiring.

B. At all systems such as fire alarm, clock and program, intercom, etc., where future stations are to be fed from adjacent outlets or terminal cabinets, all conductors required for complete installation of additional units are to be provided to nearest outlet or terminal cabinet as required. In general, all wiring installed so it will not be necessary to remove existing conductors and repull additional wiring to install additional units. All spare conductors properly labeled and terminated in outlet boxes or at terminals in terminal cabinets.

3.12 Noise Control

A. To minimize noise transmission between occupied spaces, outlet boxes at opposite sides of partitions are not to be placed back to back and installation of straight-through boxes is not permitted.

B. Contactors, transformers, starters and similar noise producing devices shall not be placed on walls, which are common to occupied spaces unless specifically called for on Plans. Where equipment is mounted on wall common to occupied spaces, provide shock mounting or noise isolators to effectively prevent transmission to occupied spaces.

C. Ballasts, contactors, starters and like equipment found noticeably noisier than similar equipment of same type are to be removed and replaced as directed by Engineer at no cost to Owner.

3.13 Fire-Stopping
A. Where raceways penetrate floors, ceilings, ducts, chases and fire walls, provide fire stopping to maintain integrity of the fire assembly. The code authority having jurisdiction shall approve fire-stopping method.

B. Where electrical boxes exceeding 16 square inches are located in fire resistive walls, fire stopping shall be provided to maintain integrity of the fire assembly.

3.14 Continuity Of Service

A. Keep outages to occupied areas to a minimum and prearrange all outages with Owner, Engineer and utilities involved. Requests for outages shall state the specific dates and hours and the maximum durations, with the outages kept to these specified times. When power interruptions will last longer than 5 minutes and cover more than 10% of the building, or affect public areas, they shall be performed on the weekend between 1 and 5 AM.

B. Contractor shall coordinate with Owner or Engineer so that work can be scheduled not to interrupt operations, normal activities, building access, etc. Coordinate work with other crafts for proper scheduling.

C. No circuits shall be turned off without prior approval from Owner or Engineer. Coordinate with the operations, normal activities, building access, etc. Coordinate work with other crafts for proper scheduling.

D. This contractor shall be liable for any damages resulting from unscheduled outages or for those not confined to the preapproved times. Include all costs for overtime labor as necessary to maintain electrical services in the initial bid proposal. Temporary wiring and facilities, if used, shall be removed and the site left clean before final acceptance. Requests for outages must be submitted at least (5) days prior to intended shutdown time.

E. When applicable, include in bid cost of minimum temporary power to Fire Alarm System, Security, Telephone/Data equipment and any other equipment designated by Owner, during time when primary building power has been interrupted.

3.15 Demolition And Salvage At Existing Structures

A. Contractor shall make all necessary adjustments to the electrical system required to meet code, accommodate installation of the new work, and for demolition and removal at existing structures.

B. Remove all existing fixtures, controls, clocks, switches, receptacles, and other electrical equipment and devices and associated wiring from walls, ceilings, floors, and other surfaces scheduled for remodeling, relocation, or demolition unless specifically shown as retained or relocated on the drawings. If existing walls, ceiling, floors, etc. are moved, extend existing devices, fixtures, and circuiting to the new location.
C. Disconnect all existing mechanical equipment scheduled for removal or relocation as described in specifications and shown on the Plans. Remove abandoned race- ways and cables. Re-label panels and motor controls centers to reflect changes.

D. If existing junctions boxes will be made inaccessible, or it abandoned outlets serve as feed through boxes for other existing electrical equipment that is being retained, new conduit and wire shall be provided to bypass the abandoned outlets. If existing conduits pass through partitions or ceilings which are being removed or remodeled, new conduit and wire shall be provided to route around the ceiling or wall and maintain service to the existing load.

E. Extend circuiting and devices in all existing walls to be furred out.

F. Locations of items shown on the drawings as existing are partially based on as- built and other drawings which may contain errors. The Contractor shall verify the correctness of the information shown prior to bidding and provide such labor and material as is necessary to accomplish the intent of the contract documents. The plans may shown some demolition conditions, but are not intended to shown all of them.

G. All materials accumulated during the demolition process are the Owners property and shall be removed from the job site as directed by the Owner.

3.16 Work At Existing Structure

A. Connect to and extend all existing electrical systems as required. Verify location of existing raceways stubbed out. If raceways indicated are not of proper size or in proper location, provide new as required for completion of project.

B. At areas where new ceilings are being installed, remove existing light fixtures and provide box extensions and reinstall existing fixtures. See Architectural Drawings for areas involved.

3.17 Safety

A. The Drawings and the specifications do not include design or construction details or instructions relating to the Contractor's safety precautions or to means, methods, techniques, sequences or procedures required for the Contractor to perform his work.

B. The Contractor shall provide necessary shoring, railing, barricades, protective devices, safety instructions and procedures to perform the work safely and to comply with State Safety Requirements and OSHA requirements.

3.18 Cleanup

A. Contractor shall continually remove debris, cuttings, crates, cartons, etc., created by his work. Such clean up shall be done at sufficient frequency to eliminate haz-
ard to the public, other workmen, the building or the Owner's employees. Before acceptance of the installation, Contractor shall carefully clean cabinets, panels, wiring devices, cover plates, light fixtures, etc., to remove dirt, cuttings, paint, plaster, mortar, concrete, etc. Blemishes to finished surfaces of apparatus shall be removed and new finish equal to the original applied.

3.19 Asbestos Bearing Materials

A. If during the course of his work, the Contractor observes the existence of asbestos or asbestos bearing materials, the Contractor shall immediately terminate further work on the project and notify the Owner of the condition. The Owner will, after consultation with the Architect, determine a further course of action.

3.20 Polychlorinated Biphenyls (PCB's)

A. If during the course of his work, the Contractor observes the existence of polychlorinated biphenyls (PCB's), the Contractor shall immediately terminate further work on the project and notify the Owner of the condition. The Owner will, after consultation with the Architect, determine a further course of action.

3.21 Testing.

A. Test the entire electrical installation to assure compliance with code and proper system operation.

1. Circuit Tests. The Contractor shall test all wiring and connections for continuity and ground before any fixtures or other loads are connected. Tests shall be made with a 500 volt DC "Megger" type tester. If tests indicate faulty insulation (less than 2 megohms) such defects shall be corrected and tested again. Contractor shall provide all apparatus and material required to make tests and shall bear all expense of required testing.

2. Load Balancing. Checks shall be made for proper load balance between phase conductors and make adjustments as necessary to bring unbalanced phases to within 15% of average load.

3. Ground Testing. Measure the OHMIC value of the Electric Service Entrance metallic "System Ground" with references to "Earth Ground" using the "Multiple Ground Rod" method and suitable instruments. Maximum resistance to ground shall be less than 10 ohms. If this resistance cannot be obtained with the ground system shown, notify the Engineer immediately for further instruction. Certify in writing to the Engineer that the grounding test has been made and that the requirements of this portion have been met for the "System Ground".


B. Materials and instrumentation shall be provided by the Contractor.
C. The Contractor shall notify the Engineer ten (10) working days prior to performance of any test.

D. The Contractor shall certify in writing that the above tests have been completed and shall provide documentation of test data.

3.22 Instruction Of Owner Employees

A. Instruct operation and maintenance personnel selected by Owner's representative at a single designated time in operation and maintenance of the entire electrical system and its components.

B. Electrical Contractor shall provide one 8-hour working day of instruction to Owner designated personnel. Software Integrator shall provide one 8-hour working day of instruction to Owner designated personnel after all equipment is fully operational and functional. The time for this instruction shall be scheduled shortly after start-up and at mutually agreed times. Contact Engineer for coordination.

C. Specific sections elsewhere in this Division may require additional training.

D. On completion of instructions, obtain from Owner certification in writing that demonstration had been given and instructions had been understood.

3.23 Demonstration Of Completed Electrical System And Controls

A. At the point of substantial completion of the project, the Electrical Contractor shall provide necessary personnel to demonstrate the essential features of the following electrical systems:
   1. Service entrance equipment.
   2. Motor Control Center and all related items such as controls, alarms, software, PLC and PC equipment, etc.
   3. Lighting system.
   4. Heating system.
   5. Ventilation.
   6. Pumps, pump station, blowers, mixers, and related controls and alarm.
   7. Instrumentation

B. Demonstrate each system once after all malfunctions have been corrected.

C. Time. Demonstration shall be held upon completion of all systems at a date agreed upon in writing by the Owner or his representative. This time shall be in addition to the instruction allowances provided.

D. Attending Parties. The demonstration shall be held by the Contractor and Electrical Subcontractor in the presence of the Owner or his designated representative,
Electrical Engineer, Project Engineer, and the Equipment Manufacturer's representative.

E. Demonstration.

1. Demonstrate the functions and locations of each system, and indicate its relationship to the Riser Diagram in the Drawings.

2. Demonstrate by "start-stop operation" and "automatic operation", how to work the controls, how to reset protective devices or replace fuses, and what to do in case of emergency.

3. All systems shall be exercised through operational tests in order to demonstrate achievement of the specified performance. Operational tests depend upon completion of work specified elsewhere in these Contract Documents. The scheduling of tests shall be coordinated by the Contractor among all parties involved so that the tests may proceed without delays or disruption by uncompleted work.

F. Certificate of Complete Demonstration. Submit a Job Completion Form found at the end of this Section. Provide documentation of all test data.

3.24 Payment for Work.

A. Payment for work under this Division shall be covered and included as part of the Basic Bid on the project, or as outlined under any schedules.
PART 1 - GENERAL

1.01 Description
   A. Provide conductors, cables, connectors, lugs, cable ties and terminations for all systems.
   B. Related work in other sections includes:
      1. Providing raceways and boxes, Section 26 0533, Raceways and Boxes.

1.02 Quality Assurance
   A. UL listed.

1.03 Submittals
   A. Submit product data sheets for primary service conductors, terminators and load break elbows per Section 26 0500.

1.04 Product Delivery, Storage And Handling
   A. Deliver conductors and cables in complete coils with UL label and bearing manufacturer's name, wire size and type of insulation.
   B. Store and handle material so as not to subject them to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.
   C. Deliver conductors No. 10 and smaller in manufacturer's original unopened and undamaged cartons with labels legible and intact.

PART 2 - PRODUCTS

2.01 Secondary service entrance conductors: Copper 600 volt type "THW", "THHN", or “XHHN” stranded, unless otherwise noted. Sizes as shown on Drawings.

2.02 Feeder conductors:
   A. Copper, 600 volt, type “THW”, “THHN” or “XHHW” unless otherwise noted, sizes as shown on drawings.
   B. Aluminum conductors are acceptable as panelboard feeders as shown on drawings for copper sizes #2/0 AWG and above only.
C. Drawings are based on copper conductors, contractor to provide a list of conductor and conduit sizes to the Engineer for review for all aluminum conductors to be used. List to be provided prior to ordering material.

2.03 Branch circuit conductors:

A. Copper, minimum size No. 12 AWG. Conductors No. 12 and No. 10 AWG shall be soft drawn, solid copper. Conductors larger than No. 10 AWG to be stranded, soft-drawn copper. Use type "THW", "THWN", or "THHN". Special conductor types where noted or required by code.

2.04 Alarm and detection system conductors: Copper minimum size No. 16, 600 volt, with code grade insulation for conditions encountered.

2.05 Security System: Two conductor No. 18 solid copper cable with overall plastic jacket. Belden 9740; Cornish 1882 or approved.

2.06 Splices, connections, terminations and cable ties:

A. Conductors No. 6 or larger, spliced, taped or terminated with solderless hydraulically applied crimp type connectors unless otherwise noted. T&B, Burndy or approved. Splices to be covered with heat shrink tubing of insulation value equal to wire insulation and wrapped with Scotch No. 33 electrical tape, half lapped.

B. Connectors: Conductors smaller than No. 6 made with 3M Company Hyflex No. 212 and No. 310, Ideal Wing-Nut, "T&B" Piggys, or approved spring connectors.

C. Lugs: Conductors No. 6 and larger, except on molded case circuit breakers, two hole, long barrel pressure tool set Thomas & Betts No. 54,000 series, Burndy "Hydent", Anderson Electric VCEL, or approved.

D. Terminal Strips:


2. All Other Systems: Molded base screw terminals "Buchanan" medium Duty Cat. 525 with tubular clamp flat base for direct mounting with center designation strip and W.H. Brady wire markers.

E. Cable ties: Thomas & Betts "Ty-Raps" of size and length required.

F. Color identification for feeder conductors: Brady B-500, vinyl cloth pipe banding tapes, Scotch Vinyl Plastic Electrical Tape No. 35, or approved.

G. Fluorescent lighting fixture ballast channel tap connectors: Electro-Products Division 3M Company "Scotchlock 567".
H. Cable and conductor identification: W.H. Brady wire markers.

PART 3 - EXECUTION

3.01 Inspection
A. Determine raceways are complete and clean of all foreign matter before installing conductors.

3.02 Delivery, Storage and Handling.
A. Deliver to site in new standard coils or reels with approved tag denoting length, wire size, insulation type and manufacturer's name.
B. Suitably protect from dirt, weather, and damage during storage and handling.

3.03 Wire Pulling.
A. Do not pull wire until all work of any nature is completed which might damage insulation or fill conduit with foreign material. Conduits shall be clean and dry before pulling wire.
B. Do not use mechanical means to pull #8 or smaller wires.
C. Exercise care in avoiding injury to wire or insulation during pulling.
D. Identify wires or circuits with wire markers after pulling. For all control wiring and telemetering systems, wire markers in junction boxes and at solenoids shall bear same numbers as terminal blocks. Keep accurate up-to-date as-built records.

3.04 General Installation
A. Circuiting. Install branch circuiting exactly as shown. Conduit may be routed at Contractor's best judgment unless directed otherwise. Home runs are diagrammatic for clarity, and may be grouped as desired. Size conduits accordingly with capacity for 25% future fill.
B. Feeder conductors: Wires shall be factory color-coded by integral pigmentation. Colored plastic tape permitted on No. 6 and larger where integral pigmentation impractical. Apply tape in spiral half-lap over exposed portions in manholes, boxes, panels, switchboards and other enclosures.
C. Branch circuit conductors: Identify with factory color conductors with separate color for each phase and gray or white for neutral.
D. All circuit conductors shall be identified with circuit number at all terminals, intermediate outlets, disconnect switches, circuit breakers, motor control centers, etc. Both ends of a given conductor shall be identified alike.
E. Clock and Program, Alarm and Detection System: Color code conductors as directed by equipment manufacturer. Where sufficient number of colors are not available to provide separate color for each item, provide W.H. Brady wire markers (or approved equal) on conductors marked similarly at all terminals and connections.

F. Install wire in conduit runs after concrete and masonry work is complete and after moisture is swabbed from conduits.

G. Apply pressure tool set lugs with tool specifically designed for application of lugs by lug manufacturer.

H. Leave six-inch single wire pigtails for connection of fixture leads and devices to branch circuits.

I. Make splices and taps only where specifically shown or approved in approved junction or splice boxes.

J. Neatly bundle and tie with cable ties conductors in panel gutters, wire gutters, motor control centers, dimmers, etc. where multiple conductors run in accessible wireways. Spacing as required to neatly group and support conductors.

K. Cable feeder and service conductors at switchboards and panel gutters. Feeder conductors cabled together as a group for one feeder and not combined in same cabling with other feeders. Cabled conductors supported from devices built into switchgear and not supported from terminals or lugs.

L. Install control conductors in separate raceways unless otherwise noted.

M. Install conductors carrying different voltages in separate raceways unless noted otherwise. Where installed in common wireways or gutters, identify neutral per NEC Article 200.

N. Quantity of conductors shown in any one raceway is not to be increased without specific permission of Engineer.

O. Do not install conductors in raceways containing non-electrical utilities such as air, oxygen and acetylene.

P. Raceway for low voltage NEC Class II wiring will be required only in walls, air plenums, inaccessible ceiling, and areas where conductors might be exposed to physical damage. Cables approved for use in air plenums and non-combustible ceilings will be accepted in lieu of conduits in plenums or non-combustible ceilings. Cables installed in cable tray shall be approved for such use.

END OF SECTION
PART 1 - GENERAL

1.01 Summary

A. Provide a complete grounding system for all electrical equipment in accordance with NEC Article 250 and established safety practices.

B. Provide grounding grid at pad-mounted transformers.

C. Provide a main grounding electrode consisting of a bare No. 4 copper grounding electrode conductor connected to a concrete-encased electrode. Concrete-encased electrode provided by others. See detail on Architectural Drawings.

D. Provide a complete grounding electrode system. All building electrodes must be tied into this system per 250.50 of the NEC. These building electrodes are: the main concrete-encased electrode, any metal underground water pipe that is in direct earth contact for at least ten feet, and the metal frame of the building where effectively grounded.

E. The grounding electrode system is to include, but is not limited to: grounding conductors, fitting connectors and all other devices and material as required rendering the system complete.

1.02 Related Work In Other Sections

A. Providing conductors, Section 26 0523, Conductors and Cables.

B. Providing raceways, Section 26 0533, Raceways and Boxes.

1.03 Quality Assurance

A. UL listed.

PART 2 - PRODUCTS

2.01 Materials

A. Ground connectors: Bronze clamp type. All clamp accessories such as bolts, nuts and washers shall also be bronze to assure a permanent corrosion resistant assembly. Bolts used to fasten lugs to enclosures must be case hardened and sized for lug hole and hole drilled into enclosure. O-Z Gedney, Burndy, Ilsco or approved.

B. Ground rod clamps: Exothermic welding type or one piece cast bronze with safety set screw. Cadweld "G" series, Copperweld 6500 series, or approved.
Grounding And Bonding

C. Ground rods: Copper or steel core copper covered, minimum 5/8 inch by 10'-0". Copperweld 9400 series, or approved.

D. All ground cable splices and joints to be made with an exothermic welding process that shall provide a weld with current-carrying capacity not less than that of the conductors welded. Soldered connections not to be used.

PART 3 - EXECUTION

3.01 Installation

A. Install in accordance with NEC Article 250.

B. Except where specifically indicated otherwise, all exposed non-current carrying metallic parts of electrical equipment to be bonded together to limit any difference of potential voltage. Metallic raceway systems may be considered the equipment grounding system where specifically noted or where approved in the NEC. Equipment grounding conductors must be installed in all non-metallic conduit systems. All load side equipment to have the neutral system isolated from the equipment grounding system. The equipment grounding system must provide a low impedance path from the equipment back to the source equipment grounding bar. This equipment-grounding bar to be connected to the system neutral at the source by a main bonding jumper sized per NEC 250.28, 250.102, and 250.168. The equipment grounding conductors to be sized at least as large as required by NEC 250.122.

C. The grounding electrode system to connect to the service neutral, if required, or to the system grounded conductor if a neutral is not required. The electrode system may terminate on the equipment-grounding bar at the main service where a properly sized main bonding jumper has been installed. Water system bonding must utilize the proper size water pipe bond clamp to match the size of the water pipe.

D. Electrical Equipment Grounding (Safety Ground):

1. Ground non-current carrying metal parts of electrical equipment enclosures, frames, man-holes, conductor raceways or cable trays to provide a low impedance path for line-to-ground fault current and to bond all non-current carrying metal parts together.

2. Equipment grounding conductor to be electrically and mechanically continuous from the electrical circuit source to the equipment to be grounded. Size ground conductors per NEC 250.122 unless larger conductors are shown on drawings.

3. Grounding conductors to be identified with green insulation. Where green insulation is not available, on larger sizes, black insulation to be used and suitably identified with green tape at each junction box or device.
4. Install metal raceway couplings, fittings and terminations secure and tight to ensure good ground continuity. Provide grounding bushing and bonding jumper where metal raceway is not directly attached to equipment metal enclosure, at concentric knock-outs, or at concentric or eccentric knockouts for circuits of over 250v to ground.

5. Lighting fixtures to be securely connected to equipment grounding conductors. Outdoor lighting standards to have a factory installed ground lug for terminating the ground wire.

6. Motors to be connected to equipment grounding conductors with a conduit ground bushing and with a bolted solderless lug connection on the metal frame. A separate equipment-grounding conductor to be run with each motor branch circuit.

7. Bonding to be provided to assure electrical continuity and the capacity to conduct safely any fault current likely to be imposed.

8. All plug-in receptacles to be bonded to the boxes, raceways and grounding conductor.

9. Equipment grounding conductors to be provided for all lengths of flexible metallic conduit. All equipment provided with two conductor cords to be rewired to provide a three-conductor type "S" cord and grounding attachment plug caps.

E. Neutrals throughout the system to be solidly grounded to one point at the system source.

F. Lighting and power panelboard to be grounded by connecting a conductor to the grounding stud and to the incoming and outgoing feeder conduits ground bushings. Each grounding-type bushing to have the maximum ground wire accommodation available in standard manufacturer for the particular conduit size. Connection to the bushing to be with wire of this maximum size.

G. The grounding stud of each secondary voltage dry type, three phase transformer to be connected separately to the grounding lug on the panelboard serving the transformer. Connection to be by means of an insulated conductor run in conduit, sized as shown on the drawings.

H. Provide a No. 6 green coded insulated conductor from each telephone terminal board to the closest effectively grounded water pipe or structural steel.

I. When included as part of the project, the central equipment for the fire detection and alarm system is to have its grounding terminal connected to the ground lug on the panelboard serving the system by means of a No. 6 green coded insulated conductor, run in 3/4 inch metal conduit, utilizing a ground clamp.
3.02 Testing

A. Grounding Electrode Conductor (GEC):
   1. Measure resistance between service equipment ground bus and each grounding electrode, using a Megger and a single length of additional wire, if necessary. Measure resistance between both ends of the additional wire used. Isolate and correct any poor connections as indicated.

B. System Ground Continuity:
   1. At panels and selected outlets, measure the ground loop resistance between the neutral conductor and raceway using a megger or equivalent. Or, at selected outlets, measure the ground loop impedance using a ground loop impedance tester.
   2. Ground loop impedance shall not exceed a value in ohms that is the voltage to ground divided by five (5) times the rated current.
   3. Isolate and correct the cause of the poor connection. If the source of the high reading cannot be practically corrected, pull a separate ground conductor into the raceway and re-test.
   4. Report findings to Engineer.

END OF SECTION
PART 1 - GENERAL

1.01 Description

A. Provide all raceways, fittings, outlet boxes, junction boxes, pull boxes and special boxes required for complete project. Install all systems in raceways unless specifically noted otherwise.

B. Not all conduits are shown. Where not specifically indicated, Contractor shall be responsible for sizing conduit per applicable codes for number of conductors.

C. Related work in other sections includes.
   1. Providing conductors, Section 26 0519, Conductors and Cables.
   2. Providing boxes, Section 26 2726, Wiring Devices and Floor Boxes.
   3. Providing supporting devices, Section 26 0529, Hangers and Supports.

1.02 Quality Assurance

A. UL listed.

1.03 Product Delivery, Storage And Handling

A. Deliver raceways with UL label and bearing manufacturer's name on each length.

B. Store and handle raceways and boxes so as not to subject them to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.

C. Cap raceway ends until used.

D. Deliver fittings in manufacturer's original unopened and undamaged packages with labels legible and intact.

PART 2 - PRODUCTS

2.01 Metal Clad Cable:

A. Cable shall be steel or aluminum jacketed interlocking armor with internal fully insulated green grounding conductor. Cable shall contain multi-conductor thermoplastic insulated type THHN color-coded solid or stranded copper conductors and shall be UL approved for the intended application.
B. Connections, terminations and fasteners shall be UL approved for the application, and designed specifically for use with the cable used, and shall have insulated throats to protect the wire.

C. Where MC Cable is used in Patient Care areas (all dental exam areas), MC Cable shall meet the requirements of NEC 517. Provide Medical Grade MC Cable.

D. Approved Manufacturers: MC Cable: AFC/A Nortek Company, Type Mc-Lite, HC-90; Alflex, Armorlite.

E. Tools: Use only tools approved by cable manufacturer. Cutting tool should be controlled depth rotary cutter.

F. See Installation for specific restrictions on use of MC Cable.

2.02 Rigid galvanized steel and IMC conduit:

A. Rigid galvanized conduit: Rigid steel zinc coated, manufactured in accordance with UL-6, ANSI, and Federal Specifications WW-C-540 standards.

B. Intermediate Metal Conduit (IMC): Zinc coated galvanized steel to comply with UL-1242, Type J and ANSI Standards.

C. Application:
   1. Employed for runs embedded in concrete, concrete block, underground, wet or damp locations, where subject to mechanical injury, and where exposed within eight feet of floor.
   2. Make threads watertight with bituminous sealer (solvent type cut back) before assembly where installed underground, in moist locations or where exposed to weather.

D. Fittings: Threaded iron or steel only, Thomas & Betts or O-Z/Gedney in sizes up to 1-1/2 inch plastic insulating type O-Z/Gedney type "A", or "T&B" 220 Series; sizes above 1-1/2 inch insulated metallic bussings O-Z/Gedney type "B" and "T&B" 1220 Series.

2.03 Rigid Stainless Steel conduit: Solid stainless steel.

A. Application: Required in most outdoor marine or corrosive environments or as specified.

B. Fittings: Threaded stainless steel. Erickson couplings, watertight split couplings (OZ or equivalent) permitted so long as all components are of the same stainless steel alloy and are waterproof.

2.04 Electrical metallic tubing (EMT): Steel zinc coated, to comply with ULI-797 and ANSI Standards.
Raceways and Boxes

A. Application:
   1. Dry locations only. May be used in framed construction, furred ceilings and above suspended ceilings.
   2. May be exposed in unfinished areas where not subject to damage.

B. Fittings: Connectors and couplings to be case steel. Preinsulated connectors and couplings up to one (1) inch trade size may be compression, indenter or setscrew type. Fittings above one (1) inch trade size shall be compression type. All connectors shall have insulated throats. Thomas & Betts, Steel City or approved.

2.05 Liquidtight flexible metal conduit: Zinc steel core with smooth gray abrasion resistant, liquidtight, polyvinyl chloride cover (with integral ground wire wound in steel core), to comply with UL 360 and ANSI Standards. Anaconda Sealtite type U.A. Electro Flex L4, Alflex Ultratite UL or EF or approved.

A. Application: For connection to equipment. Minimum size 3/4-inch for motor connections. Use 3/8-inch only for fixture and control wiring. Provide sufficient length of flexible conduit to avoid transmission of vibration.

B. Fittings: “Thomas & Betts” Supertite or approved.

2.06 Flexible metal conduit, to comply with UL360, ANSI Standards, and Federal Specification WW-6-566.

A. Application:
   1. Permitted only in dry locations where flexibility is required in length not over 18 inches.
   2. Minimum size required 1/2 inch, unless noted otherwise.
   3. Where flexibility is not required, flexible metal conduit is not to be used without written permission of the Architect or Engineer.

B. Fittings: Screw-in-type factory preinsulated "Thomas & Betts".

2.07 Non-metallic conduit: Polyvinyl chloride schedule 40 heavy wall UL listed for underground and exposed applications in accordance with National Electrical Code to comply with NEMA TC2. Carlon Electrical Products, PWC or approved.

A. Application:
   1. Permitted for runs embedded in concrete or underground in wet or damp locations.
   2. All conduit offsets and bends made with factory fittings.
   3. All 90 degree ells and conduit entrances into buildings to be with rigid galvanized conduit.
4. PVC conduit installed under roadways or areas subject to heavy traffic shall be provided with a minimum of 36" cover.

5. Galvanized rigid elbows shall be used for angles larger than 30 degrees where the conduit size is greater than one inch.

6. Provide a ground wire sized per code in all PVC conduits. Conductor quantities indicated in conduits do not include ground wires unless otherwise noted.

2.08 Wireways: All steel with screw covers. Parts coated with rust inhibitor and finished in color to match adjacent distribution equipment. Where located separate from distribution and control equipment, finish standard industrial gray enamel.

2.09 Surface raceways:

A. Allowed only upon prior approval by Architect or Engineer.

B. Surface mounted "Raceway" type, size and with number, spacing and type of outlets shown on Drawings. Provide raceways with all connectors, end fittings and miscellaneous items required for complete installation. Finish standard gray or beige as selected. Wiremold Co., Mono System or approved.

C. Install parallel to building surfaces.

2.10 Seals and Fittings:

A. Conduit plugs: Ideal "Conduloc" sizes 1/2 inch through one inch and T&B, Push Penny Plugs Series 1470 for 1-1/4 inch and larger, or approved for sealing conduits during construction. Steel City PL-200 series screwdriver slot threaded meter plugs or Killark Cat. No. CUP-O through CUP-9 for permanent plugs.

B. Floor and wall entrance fittings: O-Z/Gedney Electrical Mfg. Co. Type "FSK" entrance seal.

C. Expansion fittings: O-Z/Gedney Electrical Mfg. Co. Type ‘E’ expansion coupling with bonding jumper for up to four inch of movement.

D. Conduit seals: Vertical or horizontal type Crouse Hinds type "EYS" or approved.

E. Lead Roof Flashing Assembly: Open top caulk, six inch diameter skirt, Stoneman Engineering & Manufacturing Company No. S1000-4 for 1/2 inch diameter through eight inch diameter. Caulking compound G.E. Silicon Construction Sealant SCS-1200 or Dow Corning 781. Refer to Architectural.

F. Wall and floor fire and smoke barriers: Concrete floor type O-Z/Gedney Gedney Co. "Fire Seals" or approved. UL labeled fire barrier material installed in accordance with manufacturer's recommendations. 3M Branch Fire Barrier System;
Raceways and Boxes

Chase Technology Corp. No. CTC PR-855; Fire Stopping Products SpecSeal, Putty, Sealant, Collars, and Mortar; or approved.

2.11 Pull lines: Polyline as manufactured by "Greenlee" or approved.

2.12 Underground Marking Tape:
   A. Power: 6” wide, yellow, low density polyethylene, 4-mil thickness. Imprinted with “CAUTION – STOP DIGGING – BURIED ELECTRIC LINE BELOW” and current date. Somerset “Protect-A-Line” or approved.
   B. Telephone/Data: Similar to Power tape except green.

2.13 Boxes
   A. Outlet boxes: Steel City, National, or approved, steel boxes as best suited for purpose intended and as follows:
      2. Switch and receptacle outlets: Four inch square with proper device cover.
      3. Telephone/Data: Four inch square by minimum 2-1/8 inch deep. See Telephone/Data specification for additional requirements.
      4. Gang boxes: One piece pressed steel minimum 1-1/2 inch deep by four inches high by length required with proper device covers.
      5. Masonry outlets: Standard boxes as specified above with square cornered tile wall covers with raise of depth required for specific conditions encountered. Steel City 52-C-49 and 72-C-49 series or approved.
      6. Utility boxes: Allowed only with special permission of Engineer.
      7. Special outlet boxes: See other section of specification for special outlet boxes.
   B. Device covers for outlet boxes: Raised pattern, 3/4 inch minimum raise at plaster work, all other covers with raise equal to total wall material thickness. Surface boxes with 1/2 inch raise and rounded edges. Steel City, Raco or approved.
   C. Extension rings: 1-1/2 deep. Steel City, Raco or approved.
   D. Pullboxes
      1. Pullboxes: Galvanized steel (indoors) or cast metal (exterior or damp locations) construction, conforming to National Electrical Code, with screw-on cover.
      2. Flush Mounted Pullboxes: Provide overlapping covers with flush-head retaining screws, finished in light grey enamel.
      3. Box volumes shall meet NEC for size and number of entering conduits.
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E. Junction boxes: Minimum four inch square by 1-1/2 inch deep. In finished areas provide with two gang device cover and matching blank finish plate.

F. Floor boxes: See Section 26 2726 – Wiring Devices and Floor Boxes.

G. Weatherproof Outlet Boxes:
   1. Provide corrosion-resistant cast metal weatherproof outlet wiring boxes, of the type, shape and size, including depth of box, with threaded conduit ends, cast metal face plate with spring-hinged waterproof cap suitably configured for each application, including face plate gasket and corrosion proof fasteners.
   2. Weatherproof boxes to be constructed to have smooth sides, gray finish.
   3. Boxes used in contact with soil shall be cast iron alloy with gasketed screw cover and watertight hubs.
   4. Weatherproof Plates: Cast metal, gasketed, for switches and receptacles provide spring-loaded doors.

H. Weatherproof Junction and Pullboxes:
   1. Provide galvanized sheet steel junction and pullboxes, with screw-on covers; of the type, shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

I. Knockout Closures: Provide three (3) piece punched-steel knockout closures.

PART 3 - EXECUTION

3.01 Installation

A. General Installation:
   1. In general, install raceways concealed in construction except where shown otherwise on the Drawings or unless specifically approved by Architect or Engineer.
   2. Unless otherwise noted, size raceways in accordance with Table in Appendix C of NEC for type "THW" conductors regardless of type of conductor specified.
   3. Two or more conduits using the same routing: Mount on channel support system. Unistrut or approved.
   4. Provide pull line and cap off watertight each empty conduit provided for future installation of wiring.
   5. Conduit stubbed from a concrete slab or wall to serve an outlet under a table or to supply a machine shall have a rigid conduit coupling flush with the surface of the slab. Provide plug where conduit is to be used in future.
6. Allow minimum of 6 inches clearance at flues, steam pipes, and heat sources. Do not run conduits beneath boilers or heating units.

7. Dissimilar Metals: Avoid contact with pipe runs of other systems.

B. Lengths and Bends:

1. Maximum number of bends in any run shall be the equivalent of three (3) 90 degree bends (270 degrees total). Maximum length of any run shall be 100 feet, except as allowed in underground installations.

2. Junction and pull boxes shall be provided to maintain these limits. Do not locate pull boxes or junction boxes in finished areas unless specifically shown or special permission is obtained from Architect or Engineer.

C. Exposed raceways:

1. In finished areas run parallel with or at right angles to building structural lines and closely follow surfaces wired over. Conduits offset at panels, outlets, junction boxes, etc. Conduit 1-1/2 inch and larger suspended at locations as directed by Architect or Engineer.

2. In accessible void and furred spaces, conduit may be run in a direct line between outlets with long sweep bends and offsets closely following surfaces wired over. Suspend conduit 1-1/4 inch and larger to be run to allow maximum access to space and located as directed by Architect or Engineer.

3. For exposed runs, attach surface mounted conduit with clamps. Where conduit runs along the inside of exterior walls, mount to channel-type strut at required spacing.

D. Concealed raceways:

1. At inaccessible areas, raceways may be run in a direct line with long sweep bends and offsets. In cavity walls, run conduit in hollow spaces and do not chase interior or exterior masonry.

2. At accessible areas above lift-out or accessible ceiling areas, run conduit on top or bottom of lower cords or trusses or on underside of roof. Vertical extensions for wiring to ceiling outlets and fixtures kept to minimum length.

E. Raceways in Concrete Slabs:

1. Do NOT install conduit larger than one inch maximum in concrete slabs unless specifically shown or approved.

2. Conduits in above grade slabs shall be located in the middle of the slab. Conduit installed in any concrete slab shall have a minimum two (2) inch cover. The maximum size, spacing, and location of conduits in post-tensioned slabs shall be subject to approval by the structural engineer. Conduits larger than one inch shall not be run in slabs.
3. Space no less than 8” on center and as far apart as possible where converging at panelboard locations.

4. Do not interfere with placement of re-bar. Place raceway under rebar layer. Spacing not less than eight (8) inches on center, or as required and as wide as possible where converging at panels, etc. Adequately secure raceway, boxes, inserts, etc. by mechanical means or suitable adhesive prior to pour.

5. Cap and securely support conduits prior to concrete pour.

6. Stub-Ups:
   a. Install rigid galvanized conduit with threaded coupling set flush with finished floor. Seal with flush, threaded pipe plug.
   b. Where stub-up extends above floor, install conduit at such depth that no curved section of the elbow is exposed.

F. Expansion Joints:
   1. All conduits crossing expansion joints where cast in concrete shall be provided with expansion-deflection fittings, equivalent to OZ/Gedney AXDX, installed per manufacturers recommendations.
   2. All conduits three inches and larger where not cast in concrete shall be rigidly secured to the building structure on opposite sides of a building expansion joint with an expansion-deflection fitting across the joint, equivalent to OZ/Gedney AXDX, installed per manufacturer's recommendations.
   3. All conduits less than three inches where not cast in concrete shall be provided with junction boxes securely fastened on both sides of the expansion joint, connected together with 15 inches of slack (a minimum of 15 inches longer than the straight line length) flexible conduit with copper green ground bonding jumper. In lieu of this flexible conduit, an expansion-deflection fitting, as indicated for conduits three inch and larger, may be installed.

G. Seismic Joints:
   1. No conduits cast in concrete shall be allowed to cross a seismic joint.
   2. All conduits shall be provided with junction boxes securely fastened on both sides of the expansion joint, connected together with 15 inches of slack (a minimum of 15 inches longer than the straight line length) flexible conduit with copper green ground bonding jumper. Prior to installation, verify with Architect that the 15 inches is adequate for the designed movement, and if not, increase this length as required.

H. Underground raceways:
   1. Use galvanized rigid steel or Schedule 40 PVC with galvanized rigid steel elbows and risers.
2. Maximum length of any run shall be 300 feet, less 50 feet for each equivalent 90-degree bend.

3. Install underground marking tape buried 6-8 inches below grade, directly above conduit.

4. Run in a direct line with long sweep bends.

5. Raceways inside of building run below slab in gravel fill.

   a. Rigid Galvanized: Minimum 24-inches below finish grade, unless noted otherwise.
   b. PVC: Where installed under roadways or areas subject to heavy traffic provide a minimum of 36-inches of cover. All other locations, minimum 30-inches below finish grade, unless noted otherwise.

7. Burial Depth – Primary Service: Minimum 48-inches below finish grade or as required by serving utility.

8. All underground raceways to be made water-tight with sealed threads or couplings.

9. Rigid Galvanized conduit shall be coated entire length with coal-tar material (Koppers Bitumastic 515) or with PVC jacket (15 mil. Minimum).

I. Penetrations, Seals & Plugs
1. All 90 degree ells and conduit entrances into buildings to be with rigid galvanized conduit. Coat with coal-tar material (Koppers Bitumastic 515)

2. Provide conduit seals at exits and entrances from hazardous locations (i.e. Chlorine storage or distribution rooms), freezer rooms and other locations as required by NEC Article 500.

3. Conduit penetrations of the electrical room walls and floor must “float” via backer rod or fiberglass and caulked air tights.

4. Provide conduit plugs at all raceway openings during roughing-in to prevent entrance of foreign matter.

5. Provide floor or wall entrance fittings at all points where raceways enter or exit below finish grade at tunnels, basements or trenches.

6. Any conduit leaving the building envelope (e.g., site lighting, roof mounted HVAC equipment, etc.) to be 3/4-inch minimum and must slope downward. Seal conduits at interior side of building. Pack non-hardening duct sealing mastic around wires in the raceway.

7. Provide wall or floor fire and smoke barriers to cut off all concealed draft openings (both vertical and horizontal) where raceways perforate fire walls.

8. Roof Penetrations:
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a. Provide roof-flashing assembly at locations where conduit pierces the roof.
b. Locate conduit minimum six inches from roof curbs or flashing.
c. Provide caulking compound between counter flashing and conduit for watertight seal.

J. Multi-outlet surface raceways:

1. In general, raceways to extend full length of wall or cabinet at locations indicated.
2. See Architectural elevations and Electrical Drawings for locations and installation requirements.

K. Metal Clad Cable:

1. Permitted metal Clad Cable Uses:
   a. Metal Clad cable shall only be used for concealed branch circuit interior wiring and may be exposed only in unfinished crawl spaces or attics. It shall not be used in inaccessible ceiling areas.
   b. Metal Clad cable shall not be used for branch circuit home runs. Home runs shall be installed using conduit and conductor method from the circuit breaker panel to a junction box in the nearest accessible ceiling to the point of usage. From the junction box, Metal Clad cable may be used to each device or light. Metal Clad cable shall not be allowed from device to device.
   2. Support horizontal and vertical cable six feet on center (maximum) and within six inches of boxes with approved cable clamps. Cables shall not rest on accessible ceiling tiles. Attach cables with metal clips or plastic cable ties to support wires from structure. Cable shall not be supported from, or come in contact with, mechanical ducts, water, sprinkler or gas piping; maintain six inch separation minimum.
   3. Cable shall be cut with manufacturer-approved devices.
   4. Junction Boxes: Splice conductors only in accessible junction boxes. Provide junction box at all cable penetrations of wall, ceiling or floor surfaces for equipment connections; cable shall not be run directly through finished surfaces. Provide junction box at transition from concealed to exposed wiring. Provide junction box at transition from interior to exterior wiring.
   5. Voltage Drop: Conductors over 75 feet for 120 volt, and over 200 feet for 277 volt, for branch or individual circuit home runs from equipment connection, receptacle or lighting fixture shall be No. 10 AWG minimum.
   6. Where cable penetrates fire-rated walls or floors, provide mechanical fire stop fitting with UL listed fire rating equal to wall or floor rating.

L. Boxes
1. Verify location of all outlet boxes with actual field conditions and plans to avert possible installation conflicts. Architect or Engineer reserves the right to make minor changes prior to installation without cost to the Owner. Coordinate work with that of other trades.

2. Toe Spaces: Boxes for receptacle outlets in toe spaces to be mounted horizontally.

3. Above Counter: Boxes for devices above counter should be typically mounted vertically, however, due to unforeseen field modification in casework and backsplashes, please coordinate with the architect.

4. Extension rings: Do not add more than one to any box with maximum depth of box and extension ring not to exceed three inch unless specifically indicated otherwise.

3.02 Cleaning

A. Complete raceways system before pulling-in conductors.

B. Remove all foreign matter from raceways and blow out or vacuum smaller conduits and pull mandrel through larger conduits prior to installing conductors.

3.03 Painting

A. All exposed conduits on painted walls to be painted to match wall and trim colors.

END OF SECTION
PART 1 GENERAL

1.01 Description

A. This Section shall include furnishing and installing switchboards, sub-distribution, and branch circuit panelboards with components as indicated. Incorporate switching and protective devices of the number, ratings and type shown and noted herein.

B. Switchboards to include necessary interconnections, instrumentation and control wiring for a complete and satisfactory operating system.

C. All panelboards and breakers to be fully-rated, Series rated panel boards and breakers are not acceptable.

1.02 Related work in other sections includes:

A. Providing concrete housekeeping pad for floor-mounted equipment under Division 03.

B. Providing identification, Section 26 500, Basic Electrical Materials and Methods.

C. Providing cable ties and lugs, Section 26 0519, Conductors and Cables.

D. Providing grounding, Section 26 0526, Grounding and Bonding.

1.03 Quality Assurance

A. American National Standards Institute (ANSI).
   1. 67 Panelboards (ANSI/UL 67).
   3. ANSI Z55.12 gray finishes for industrial apparatus and equipment.

B. Institute of Electrical and Electronics Engineers (IEEE).
   1. Std. 141-76 Electric Power Distribution for Industrial Plants.

C. National Fire Protection Agency (NFPA).
   1. NFPA 70 National Electrical Code.

D. Underwriters’ Laboratory (UL).
1. UL 50: Cabinets and Boxes.
2. UL 67 Panelboards.
3. UL 869: Service Disconnects.
4. UL 891: Dead-Front Switchboards.

E. National Electrical Manufacturers Association (NEMA)
1. NEMA AB-1: Molded Case Circuit Breakers.
2. NEMA KS-1: Enclosed Switches.
3. NEMA PB-2: Dead-Front Distribution Switchboards.
4. NEMA SG-5: Switchgear Assemblies.
5. Test Switchboards in accordance with NEMA PB2 requirements.


1.04 Submittals

A. Shop Drawings
1. Submit complete shop drawings with dimensions, components and internal connections in accordance with Division 01 or Section 26 0500, Basic Electrical Materials and Methods (when included).

B. Switchgear: Submit shop drawings showing following:
1. Bus ratings and arrangement.
2. Frame size, trip setting, and interrupting rating of overcurrent devices.
3. Manufacturer's recommended settings of time delays and ground fault sensing adjustments of adjustable circuit breakers which demonstrate selective coordination.
4. Fault bracing rating of total assembly.
5. Elementary wiring diagrams for metering and relay protection.
6. Scale ranges of meters.
7. Dimensioned elevation and plan views.
8. Indicate top and bottom conduit entrance areas and dimensions.
9. Estimated short circuit minimum 22,000 AIC unless noted otherwise in drawings.

C. Submit operation and maintenance data in accordance with Division 01 or Section 26 0500, Basic Electrical Materials and Methods (when included).
1.05 Product Delivery, Storage And Handling

A. Deliver with UL label and bearing manufacturer's name. Provide all equipment and each section with appropriate UL labels located in conspicuous places. Provide readily accessible nameplates.

B. Provide starters in manufacturers original cartons with labels intact.

C. Panelboard exterior trim separately packed to prevent damage during delivery and storage on site.

D. Upon receipt-open shipping carton and inspect for physical damage. Open switchgear and check interior condition. Prepare a written report of any damaged or unacceptable conditions.

E. Store and handle panelboards so as not to subject panels to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation. Keep switchboards wrapped or otherwise protected with plastic and stored on wood pallet on floor.

PART 2 PRODUCTS

2.01 Branch Circuit Panelboards:

A. Type:
   1. NQOB for 120/208-volt panelboards with bolted breakers having minimum interrupting capacity of 22,000 amperes RMS symmetrical, unless noted otherwise at the bottom of the panel schedules. Breaker trip sizes and number of poles as indicated on the Drawings.

B. Bussing:
   1. Copper or aluminum.
   2. Tap Arrangement: Phase sequence type, permitting a two (2) or three (3) pole breaker to be installed at any location.
   3. All bolts used to connect current-carrying parts together shall be accessible for tightening from the front of the panel.
   4. Wiring terminals: Compression or set screw type for copper conductors; bolted to bus.

C. Construction: Flush or surface mounted as indicated with following:
   1. Door with lock to match existing branch circuit panel locks. Verify on site.
   2. Flush mounted panels: Concealed mounting hardware for exterior trim and door. No exposed fastenings or holes permitted.
3. Surface mounted panels: Completely metal enclosed. Exposed trim fastenings and hardware permitted. Surface mounted panels located side by side to be same height and depth.

4. Gutters minimum of five inch with six inch required at feeder end of panel or where feeder runs inside of gutters. Separate feeder lugs and terminals for each feeder connection with lugs as specified in Section 26 0519 Conductors and Cables. Split door split bus panels provided with two-inch separation of sections.

2.02 Sub-distribution panels:

A. Flush or surface mounted as indicated on Drawings.

B. Provide nameplate reading "SUBDISTRIBUTION PANEL 4A1, etc." and separate nameplate at each section indicating voltage and phase.

C. Finish industrial gray on all exposed surfaces.

D. All other items to be as specified for branch circuit panelboards.

E. Similar to Square D I-line series.

2.03 Circuit Breakers

A. Multiple breakers common trip.

B. Combination breaker and ground fault interrupter: 10,000 amps or 20,000 IC rated, bolted connection.

C. Breakers for panel switched lighting to be labeled "SWD" for multiple operations.

D. Location of circuit breakers in panels: Install circuit breakers in panels at locations as indicated in the panel schedules.

E. Main breaker, when so equipped, shall be individually mounted separate from branch breakers. Where used as service disconnect, breaker and panelboard shall be listed for use as service entrance equipment.

F. Branch circuit breakers shall be bolt-on.

G. Provide circuit breaker handle guards to prevent accidental shut-off of equipment for breakers supplying obviously constant circuits for clocks, time switches, refrigeration, freezers, sound systems, fire alarm and other like systems as directed.

2.04 Identification:

A. Panelboards: In accordance with Section 26 0500. Locate nameplates attached to top center of interior trim. Nameplate to indicate panel, voltage and phase charac-
teristics such as Panel 2AA, 120/208 volt, three phase. Panel labeling to correspond to distribution system labeling.

B. Circuit breakers: Number circuit breakers as indicated in panel schedules. Numbers engraved and filled in interior trim or permanently attached metal numbers equal to Wilson Heard markers or plastic numbers. Adhesive backed printed numbers not approved. Other methods of numbering as approved by Engineer.

C. Provide typewritten circuit schedules for panelboards, cross-connect panels and terminal cabinets. Schedules shall be covered with minimum of 0.018-inch thick clear rigid plastic installed in permanently attached metal frame holder located on inside face of door. Schedules to use final assigned room names/numbers, loads not plan designations.

D. When making modifications to existing equipment or panelboards, provide labels as indicated in this section. Provide new typewritten circuit schedules for all modified panelboards.

2.05 Panel finish:

A. All panels shall be provided with a rust-inhibiting phosphatized primer coating approved by the paint manufacturer.

B. At all finished areas factory finish to match adjacent surfaces. Rodda Baking Enamel.

C. In unfinished or utility areas standard factory industrial gray.

D. Paint sides, top and front of surface mounted panels.

2.06 Lugs:

A. In accordance with Section 26 0519, Conductors and Cables.

B. Compression or set-screw type, bolted to bus or CB output.

C. Provide double or feed thru lugs at panels where feeders are extended to additional panels.

D. Provide double capacity neutral lugs for all panelboards having an isolated bus.

E. Provide oversized lugs as required for aluminum panel feeders to accommodate sizes shown in feeder schedule on drawings.

PART 3 EXECUTION

3.01 Inspection

A. Coordinate NEC clearance requirements space provided to assure adequate clearances are maintained. Notify Engineer if space provided is inadequate for specified equipment and/or for maintaining required code clearances. Do not order equipment until any space inadequacies are resolved.

3.02 Installation

A. Prior to installation of switchgear and transforming layout the electrical rooms and obtain approval of the layout from the code authority having jurisdiction.

B. Install panelboard in accordance with manufacturer's written instructions.

C. Furnish and install three spare one-inch conduits from the top of each recessed panel, to an accessible point above the ceiling.

D. Conduit shall be securely fastened to all panelboards and sheet metal outlet, junction, and pull boxes with galvanized locknuts, and one bushing installed in accordance with standard practice. The full number of threads shall project through to permit the bushing to be drawn tight against the end of the conduit, after which the locknut shall be made up sufficiently tight to draw each into firm electrical contact with the box.

E. Do not install exterior trims until finish painting is completed. Clean interior of panel (construction dust, paint over-spray, etc…) prior to installation of exterior trim.

F. Keys: Collect all panel keys. Combine all keys on one key ring and submit at time of substantial completion.

G. No low voltage wiring (less than 120 volt) to be installed in panel enclosures.

H. Breaker handle guards shall be provided on each circuit supplying obviously constant loads to prevent accidental shutting off. Such loads are refrigeration, contactor controlled circuits, freeze protection, etc.

I. Care shall be taken to terminate ground conductors from isolated ground receptacles only on the isolated ground bus in a panel. Do not terminate bonding conductors on an isolated ground bus.

J. Bolt panelboards to wall structure as required for appropriate seismic zone. Provide adequate backing as required.

K. All nameplates, labels, screws, bolts, or other hardware shall be in place prior to acceptance.
L. Install floor-mounted equipment on a three-inch high concrete pad extending three inches beyond front and sides of said equipment. Level and securely fasten equipment to concrete pad.

M. Provide four-foot wide rubber insulation mats on floor in front of switchboard for its entire length.

3.03 Power One-Line Diagram
A. Mount one-line diagram from Plans at main distribution assembly. Use a clean copy and mount under clear plastic cover, set in a metal frame.

3.04 Field Test
A. Prior to energizing distribution equipment, perform following test and adjustments according to manufacturer's recommendations and instructions.
B. Continuity check.
C. Insulation level (megger) tests.
D. Short circuit test.

3.05 Adjustment And Cleaning
A. Tighten bus connections and mechanical fasteners. Check bus-to-bus and breaker-to-bus connection for correct torque tightening.
B. Tighten feeder and circuit breaker connections as recommended by the manufacturer.
C. Clean all foreign matter from interior and exterior of equipment and touch-up scratched or marred surfaces to match original finish.
D. Adjust interior trim to fit tight against exterior trims.
E. Check all moving mechanical parts for proper operation.

END OF SECTION
PART 1 - GENERAL

1.01 Description

A. Provide all wiring devices and finish plates as required unless specifically indicated otherwise.

B. Related work in other sections includes:
   1. Providing identification, Section 26 0500, Basic Electrical Materials and Methods.
   2. Providing conductors, Section 26 0519, Conductors and Cables.
   3. Providing boxes, Section 26 0533, Raceways and Boxes.

1.02 Quality Assurance


C. National Electrical Manufacturer's Association (NEMA): WD 1-79 General Purpose Wiring Devices.


E. Underwriters’ Laboratory (UL): UL-20 Standard for Snap Switches.

1.03 Submittals

A. Submit product data sheets per Division 01 or Section 26 0500, Basic Electrical Materials and Methods (when included).

B. Submit operation and maintenance data per Division 01 or Section 26 0500, Basic Electrical Materials and Methods (when included).

1.04 Product Delivery, Storage And Handling

A. Deliver with UL label and bearing manufacturer's name in manufacturer's original unopened and undamaged cartons with labels legible and intact.
B. Store and handle material so as not to subject them to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.

PART 2 - PRODUCTS

2.01 Acceptable manufacturers: Arrow-Hart, General Electric, Hubbell, Leviton, Pass & Seymour or approved.

2.02 Switches: Specification Grade, Quiet Type, Minimum rating 120/277 volt, 20 amp unless otherwise noted. Finish as selected by Architect.

A. Toggle and lock switches: Federal Specifications as listed in Quality Assurance.
   3. Three-way Switch: Arrow-Hart 1993 or approved.

B. Momentary contact switch: Three position, two circuit with center "off", 20 amp, 120/277 volt. Arrow Hart 1995; or approved.

C. Emergency Off Pushbuttons:
   1. Electrical panelboard remote emergency off switch, full guard, red pushbutton, nameplate to read “POWER OFF” with stainless steel finish plate. Pushbutton to be connected to panelboard shunt-trip main circuit breaker. Square D Class 9001 type SKRIRH13 with KN499 nameplate, or approved.
   2. Gas solenoid remote emergency on/off switch, full guard, yellow pushbutton, nameplate to read “GAS ON/OFF” with stainless steel finish plate. Pushbutton to be connected to gas system solenoid valve. Square D Class 9001 type SKR1YH13 with KN499 nameplate, or approved.

2.03 Receptacles: Specification Grade. Conform to Federal Specifications as listed in Quality Assurance. Finish [gray] [white] [ivory] [as selected by Architect].

A. Duplex, double parallel slot 20 ampere, 120 volt, typical locations, Arrow-Hart 5362 or approved.

B. Ground fault circuit interrupter receptacle: 20 ampere, duplex, double parallel slot, Arrow-Hart GF5362 or approved.

C. Clock hanger 120 volt receptacle: Fifteen ampere, 125 volt recessed receptacle with stainless steel wall plate. Arrow-Hart 5708.

D. Isolated ground receptacles, 120 volt, 20 ampere, duplex, orange nylon face NEMA 5-20 R, Arrow-Hart IG5362HG or approved.
E. Transient voltage surge suppresser, 20 ampere, 125 volt, duplex, nylon face NEMA 5-20R, where isolated ground surge suppresser is indicated. Arrow-Hart IG5250S or approved.

F. Tamper resistant 15 ampere, 120 volt duplex receptacle. Arrow-Hart TR82 or approved.

G. Hospital grade receptacle, 120 volt, 20 ampere, duplex Arrow-Hart 5362HG or approved. Refer to NEC Article 517 for required locations.

H. Flush floor receptacles to be duplex and to have brass, hinged flap lids. Provide carpet flanges in carpeted floors. See also Recessed Floor Boxes.

2.04 Finish plates:

A. At surface wiring, raised galvanized industrial type. National Association of Electrical Distributors 12000 Series.

B. At all typical location: Thermoplastic – color as selected by architect.

C. Engraved plates: See Execution for requirements.

D. Receptacles fed by emergency circuits shall have red devices with “EMERGENCY POWER” engraved in white letters on a red nylon plate with panel and circuit number designation engraved on plate.

E. Damp location receptacle finish plates: Stainless steel, type 302 horizontal plate. Arrow-Hart 4501 or approved.

F. Wet locations (exterior) receptacle finish plate: UL listed to be weatherproof while in use. Cover base to be constructed of heavy duty noryl and cover to be constructed of lexan. Thomas & Betts. Perfect Line Weatherproof cover or approved.

G. Telephone and Data: Blank coverplate, finish to match receptacle.

H. Special Plates: See Drawings or other sections of Specifications.

I. Plate Securing Screws: Metal with heads finished to match finish plate.

PART 3 - EXECUTION

3.01 Inspection

A. Determine outlet boxes, raceways and conductors are properly installed and outlet boxes are cleaned of all foreign matter before installing devices and finish plates.

B. Inspect each wiring device for defects.
3.02 Installation

A. Install wiring devices in accordance with NECA “Standard of Installation”.

B. Do not install devices or finish plates until final painting is complete.

C. Switches:
   1. Install switches with the OFF position down.
   2. Do not group or gang switches in outlet boxes unless they can be so arranged that voltage between adjacent switches does not exceed 300 volts, or installed in boxes equipped with permanently installed barriers between adjacent switches.

D. Receptacles:
   1. Install receptacles with the ground pole on top.
   2. Install a separate green or bare wire between the receptacle strap grounding (green) screw and a screw into the outlet box. Self-grounding strap not approved as grounding means.

E. Finish Plates:
   1. Install devices and finish plates plumb with building lines.
   2. Use jumbo size plates for outlets installed on masonry walls.
   3. Do not install finish plates until final painting is complete.

3.03 Identification

1. Switches: Where 2 or more switches are ganged and where indicated, identify each switch with approved legend engraved on wall plate.
2. Receptacles: Identify the panelboards and circuit number from which served. For nylon faceplates, engrave panel and circuit number on face and highlighted in contrasting color. For stainless steel plates use machine printed, pressure sensitive, abrasion resistant label tape on face of plate and durable wire markers or tags within outlet box.

3.04 Testing

A. Operate each wall switch with circuit energized and verify proper operation.

B. Verify that each receptacle devices is energized.

C. Test each receptacle for proper polarity.

D. Test each drive for ground continuity.
E. Test each ground fault circuit interrupter operation with both local and remote fault simulations according to manufacturers recommendations.

3.05 Cleaning

A. Internally clean device, device outlet box and enclosure.

B. Replace stained or improperly painted finish plates or devices.

END OF SECTION
SECTION 26 3200
POWER GENERATOR SYSTEMS

PART 1 - GENERAL

1.01 Description
   A. Upgrade existing generator distribution system to 600 amps. Existing generator to remain.

1.02 Related work in other sections includes:
   A. Providing identification, Section 26 0500, Basic Electrical Materials and Methods.
   B. Providing conductors, Section 26 0519, Conductors and Cables.
   C. Providing grounding, Section 26 0526, Grounding and Bonding.
   D. Providing raceways, Section 26 0533, Raceways and Boxes.

1.03 Quality Assurance
   A. UL listed.

1.04 Submittals
   A. Submit product data sheets in accordance with Division 01 or 26 0500, Shop Drawings and Material Lists, Basic Electrical Materials and Methods (when included).
   B. Submit operation and maintenance data in accordance with Division 01 or 26 0500, Electrical Equipment and Maintenance Manuals, Basic Electrical Materials and Methods (when included).

1.05 Product Delivery, Storage And Handling
   A. Deliver with UL labels and bearing manufacturer's name.
   B. Deliver in manufacturer's original unopened and undamaged crates, or packages.
   C. Store and handle so as not to subject material to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.

PART 2 - PRODUCTS

2.01 General:
   A. System voltage: 120/208 3-Phase, 4-Wire
2.02 Automatic Transfer Switch (ATS):

A. General: The automatic transfer switches to be designed, built, tested, furnished and warranted by the engine-generator manufacturer to ensure one source of responsibility for the entire standby system. The transfer switches to be provided with the same five-year warranty as the engine-generator set.

B. Operation: The ATS shall sense complete loss of normal power on any phase and signal the emergency generating set to start within 10 seconds after normal power failure. When the emergency power attains proper voltage and frequency, the ATS will automatically transfer the load to emergency power. When the normal power is restored, the ATS shall sense this and retransfer the load from emergency power to normal power, and signal the emergency source to stop.

C. Rating:

1. The transfer switch shall be rated for all classes of load including inductive and non-inductive load at 600 volts and tungsten lamp load at 250 volts. The transfer switch portion of the control shall be designed, built, and tested to close on an inrush current up to and including twenty (20) times the continuous rating of the switch without welding or excessive burning of the contacts. The transfer switch shall be capable of switching the load up to and including fifteen (15) times the continuous rating of the switch and capable of enduring six thousand (6,000) cycles of operation, at rated current, at a rate of six (6) cycles per minute, without failure. One cycle shall consist of one complete opening and closure of both sets of contacts on an inrush current of ten (10) times the continuous rating of the switch.

2. Refer to the project drawings for specifications on the sizes and types of transfer switch equipment, withstand and closing ratings, voltage and ampere ratings, enclosure type, and accessories. Unless otherwise noted on the drawings, transfer switches operating at 150VAC (line to neutral) and lower, and transfer switches serving exclusively 3-wire loads shall be 3-pole with solid neutral. All other transfer switches shall be 4-pole.

3. Main contacts shall be rated for 600 Volts AC minimum.

4. Transfer switches shall be rated to carry 100 percent of rated current continuously in the enclosure supplied, in ambient temperatures of -40 to +60 degrees C, relative humidity up to 95% (non-condensing), and altitudes up to 10,000 feet (3000M).

5. Transfer switch equipment shall have withstand and closing ratings (WCR) in RMS symmetrical amperes greater than the available fault currents shown on the drawings and at the specified voltage. The transfer switch and its upstream protection shall be coordinated. The transfer switch shall be third party listed and labeled for use with the specific protective device(s) installed in the application.
D. Construction:

1. Transfer switches shall be double-throw, electrically and mechanically interlocked, and mechanically held in the source 1 and source 2 positions. The transfer switch shall be specifically designed to transfer to the best available source if it inadvertently stops in a neutral position.

2. An indoor, non-ventilated NEMA 1 enclosure with key locked door shall house the transfer switch and control components. The indicating lamps and meters shall mount on the front to be visible without opening doors.

3. The transfer switch, with terminal lugs for either copper or aluminum wire, shall have individual heat resistant chambers enclosing solid silver cadmium oxide, double break contacts. Provide with arc chutes that have covers for extinguishing arcs and preventing interphase flashover. The transfer switch, with mechanical and electrical and interlocks to prevent simultaneously energizing both normal and emergency service shall be mechanically held on line side with auxiliary contacts rated 6-amp, 120 volt AC; 3-amp, 240, AC on line side and generator side of transfer switch.

4. Transfer switches designated on the drawings as 4-pole shall be provided with a switched neutral pole. The neutral pole shall be of the same construction and have the same ratings as the phase poles. All poles shall be switched simultaneously using a common crossbar. Substitute equipment using overlapping neutral contacts is not acceptable.

5. Transfer switches that are designated on the drawings as 3-pole shall be provided with a neutral bus and lugs. The neutral bus shall be sized to carry 100% of the current designated on the switch rating.

E. The operating power for transfer and retransfer to be from the engine generator set. Controls to automatically retransfer to the normal source if the emergency source fails.

F. Operator Panel: Operator Panel. Each transfer switch shall be provided with a control panel to allow the operator to view the status and control operation of the transfer switch. The operator panel shall be a sealed membrane panel rated NEMA 3R/IP53 or better (regardless of enclosure rating) that is permanently labeled for switch and control functions. The operator panel shall be provided with the following features and capabilities.

1. High intensity LED lamps to indicate the source that the load is connected to (source 1 or source 2); and which source(s) are available. Source available LED indicators shall operate from the control microprocessor to indicate the true condition of the sources as sensed by the control.

2. High intensity LED lamps to indicate that the transfer switch is “not in auto” (due to control being disabled or due to bypass switch (when used) enabled or in operation) and “Test/Exercise Active” to indicate that the control system is testing or exercising the generator set.
3. “OVERRIDE” pushbutton to cause the transfer switch to bypass any active time delays for start, transfer, and retransfer and immediately proceed with its next logical operation.

4. “TEST” pushbutton to initiate a preprogrammed test sequence for the generator set and transfer switch. The transfer switch shall be programmable for test with load or test without load.

5. “RESET/LAMP TEST” pushbutton that will clear any faults present in the control, or simultaneously test all lamps on the panel by lighting them.

6. The control system shall continuously log information on the number of hours each source has been connected to the load, the number of times transferred, and the total number of times each source has failed. This information shall be available via a PC-based service tool and an operator display panel.

7. Alphanumeric display panel:
   a. Display source condition information, including AC voltage for each phase of normal and emergency source, frequency of each source. Voltage for all three phases shall be displayed on a single screen for easy viewing of voltage balance. Line to neutral voltages shall be displayed for 4-wire systems.
   b. Display source status, to indicate source is connected or not connected.
   c. Display load data, including 3-phase AC voltage, 3-phase AC current, frequency, KW, KVA, and power factor. Voltage and current data for all phases shall be displayed on a single screen.

G. Internal Controls

1. The transfer switch shall incorporate adjustable time delays for generator set start (adjustable in a range from 0-15 seconds); transfer (adjustable in a range from 0-120 seconds); retransfer (adjustable in a range from 0-30 minutes); and generator stop (cooldown) (adjustable in a range of 0-30 minutes).

2. Automatic bypass to re-transfer the load from generating set to normal power source if the emergency set should fail during the delay period.

3. Provide an exerciser clock to automatically start the generating set at regular intervals and allow it to run for a preset time period, such as 30 minutes per week.

4. Provide a with/without load selector switch to test or exercise the generator.

5. Transfer switch voltage sensors shall be close differential type, providing source availability information to the control system based on the following functions:
a. Monitoring all phases of the normal service (source 1) for under voltage conditions (adjustable for pickup in a range of 85 to 98% of the normal voltage level and dropout in a range of 75 to 98% of normal voltage level).

b. Monitoring all phases of the emergency service (source 2) for under voltage conditions (adjustable for pickup in a range of 85 to 98% of the normal voltage level and dropout in a range of 75 to 98% of pickup voltage level).

c. Monitoring all phases of the normal service (source 1) and emergency service (source 2) for loss of a single phase.

H. Control Interface

1. The transfer switch will provide an isolated relay contact for starting of a generator set. The relay shall be normally held open, and close to start the generator set. Output contacts shall be form C, for compatibility with any generator set.

2. Provide one set Form C auxiliary contacts on both sides, operated by transfer switch position, rated 10 amps 250 VAC.

2.03 Approved Manufacturer: Eaton, Square-D or approved.

PART 3 - EXECUTION

3.01 Inspection

A. Examine all areas to receive engine generator set, transfer switches and coordinate work with other trades. In case of question consult engineer prior to proceeding with work.

3.02 Installation

A. Install all equipment in strict accordance with manufacturer's written instruction. Entire installation to be under the supervision of equipment manufacturer's authorized factory representative.

END OF SECTION
SECTION 26 5100
LIGHTING FIXTURES

PART 1 - GENERAL

1.01 Description

A. Provide lighting fixtures of type and wattages indicated on Drawings by letter and number shown adjacent to lighting outlet symbol. A fixture typical for location is to be installed at every lighting outlet unless otherwise indicated.

B. Provide fixtures complete with lamps, ballasts, reflectors, diffusers, lenses, shielding, hangers, poles and accessories, concrete pole bases and fittings.

C. Provide lamps for fixture being supplied by others in casework, hoods and serving counter sneeze guards.

D. Related work in other sections includes:
   1. Providing concrete bases for poles, Division 03.
   2. Providing conductors and connectors, Section 26 0519, Conductors and Cables.
   3. Providing raceways and fittings, Section 26 0533, Raceways and Boxes.
   4. Providing fire rated enclosures at light fixtures.

1.02 Quality Assurance

A. UL listed or CSA certified for application.

1.03 Submittals

A. Submit a complete list of fixtures, lamps and ballasts with catalog numbers, manufacturer’s drawings, photographs or catalog sheets for approval prior to ordering fixtures. Submittal to be in accordance with Division 01 or 26 0500, Shop Drawings and Materials Lists (when included).

B. Submit operation and maintenance data in accordance with Division 01 or 26 0500, Electrical Equipment Maintenance Manuals (when included).

1.04 Product Delivery, Storage And Handling

A. Deliver fixture in manufacturer's original unopened packages with labels legible and intact.

B. Deliver with UL label and bearing manufacturer's name.

C. Deliver poles wrapped and protected from damage.
D. Store and handle so as not to subject materials to corrosion or mechanical damage and in manner to prevent damage from environment and construction operation.

PART 2 - PRODUCTS

2.01 General:

A. Fixture types: See light fixture schedule on drawings for fixture types and acceptable manufacturers.

B. Provide fixtures with ACL, damp or wet label if required for the applications indicated.

C. All recessed fixtures shall be free of light leaks.

2.02 Approved Manufacturers:

A. See Light Fixture Schedule on drawings for approved manufacturers and specifically approved products (models).

B. Listing of a manufacturer on the Light Fixture Schedule (or other Contract Documents) does not constitute the approval of a specific fixture model not otherwise specifically identified on the Light Fixture Schedule.

C. The supplier/contractor is responsible to provide approved light fixtures that meet the requirements as specified herein and on the drawings (Light Fixture Schedule, general and keyed notes, etc.).

D. Other manufacturer’s products submitted for approval must meet the aesthetic appearance and quality standards of the specific model listed as the basis of design. The contractor shall, at the discretion of the Engineer and/or Architect and at no cost to the Owner, replace any product deemed inferior to the specifically specified light fixture model.

2.03 LED (Light Emitting Diode):

A. LED manufacturer will include, but not be limited to, light source, luminaire, power supply and control interface with added components as needed for complete and functioning system.

B. Warranty: LED systems and complete luminaires must have a manufacturer’s warranty of 3 year from date of substantial completion.

C. Comply with ANSI chromaticity standard for classifications of color temperature. See luminaire schedule for specified LED lamp color and color temperature. UL or ETL listed and labeled.

D. Luminaire testing per IESNA LM-79 and LM-80 procedures.
E. Lamp life for white LEDs: 50,000 plus hours with lamp failure occurring when LED produces 70 percent of initial rated lumens.

F. Lamp life for color LEDs: 30,000 plus hours with lamp failure occurring when LED produces 50 percent of its initial rated lumens.

G. Provide shop drawings, with LED systems based on lumen output at 70 percent lumen depreciation for white LEDs and 50 percent lumen depreciation for color LEDs. Initial lumens for all colors of LEDs must be listed individually.

H. LED Drivers: reverse polarity protection, open circuit protection, require no minimum load. Minimum 80% efficiency. Class A noise rating.

I. Dimming: LED system capable of full and continuous dimming.

J. LED light source manufacturers: Nichia, Cree, Osram/Sylvania, GE Lumination or approved.

2.04 Fixture lengths: Furnish fixtures of lengths shown on Drawings. At continuous runs furnish joiner plates, end plates and all required fittings.

2.05 Fixture mounting:

A. General: Provide all blocking and supports as required. Fixtures may be supported from ceiling system unless specifically indicated otherwise.

B. Surface mounted fixtures: Provide UL approved fixtures at low-density cellulose fiber ceilings. 1-1/2 inch spacers not permitted unless specified fixture is unavailable with low-density rating.

C. Recessed fixture: Provide fixtures with plaster frames, ceiling flanges and hang- ers as required for specific ceiling conditions. Verify ceiling types prior to ordering fixtures. Provide thermal protection for all High Intensity Discharge and Incandescent fixtures mounted in a recessed application (non lay-in ceiling).

D. Stem suspended fixtures: Provide stems with aligned canopies. Stems of length specified or required for proper mounting of fixture.

E. Positively attach all lighting fixtures to suspended ceiling systems. Attachment device to have capacity of 100 percent of lighting fixture weight acting in any direction.

F. Lighting fixtures weighing more than 20 pounds but less than 56 pounds shall have in addition to the requirements outlined above, two No. 12 gauge hangers connected from fixture housing to structure above. These wires may be slack. Fixtures weighing more than 56 pounds are to be suspended from the structure and not from suspended ceilings.
PART 3 - EXECUTION

3.01 Inspection

A. Verify location, ceiling types and mounting requirements for each fixture prior to ordering fixtures.

B. Verify voltage at each fixture outlet prior to installation.

C. Examine fixtures for damage or broken parts and replace prior to installation.

3.02 Installation

A. Coordinate installation of fixtures with other subcontractors, and verify methods of hanging and supporting required.

B. All fixtures to be illuminated at time of acceptance.

C. Fixtures located in mechanical and store rooms to be coordinated with ductwork, piping and structural members. Adjust stems as required for proper illumination of the area.

D. All recessed fixtures to be flex connected to branch circuit outlet box unless fixture is provided with code approved junction box. Connection to conform to Article 410-67 of NEC.

E. Fixtures recessed into fire rated ceilings shall be provided with an approved fire-rated enclosure or have an enclosure built around them that will not violate the fire rating of the ceiling.

F. See architectural reflected ceiling plan for exact location of fixtures and ceiling types.

G. All light outlets shall be supplied with a fixture. Outlet symbols on the drawings without a type designation shall have a fixture the same as those used in similar or like locations.

H. Fixtures of a given description may be used in more than one type of ceiling. The fixture list and electrical drawings do not indicate what type of ceiling a recessed fixture is intended for. Consult the Architectural Reflected Ceiling plan to obtain this information. The contractor shall confirm that the specified fixtures are compatible with the ceiling system and is responsible to provide all mounting apparatus required for proper installation.

I. Where fixtures are mounted under cabinets, in soffits, coves, or other physically restricting spaces, the contractor shall verify that the fixtures will fit the space prior to ordering.
J. Under cabinet and similar fixtures are to be hard wired. Flexible cords similar to SO cord are not acceptable.

3.03 Adjustment And Cleaning

A. Fixture supports shall provide proper alignment and leveling of fixtures.

B. Aim adjustable fixtures as directed by Architect or Engineer. Exterior fixtures should be adjusted for proper illumination of areas.

C. Clean all foreign matter from interior and exterior of fixtures and from exterior of poles, touch-up scratched or marred surfaces to match original finish.

3.04 Testing

A. Operate the complete exterior lighting system for seven (7) consecutive days. When the lighting performance is satisfactory to the Engineer, the system will be accepted.

END OF SECTION
SECTION 27 2500
TELEPHONE AND COMPUTER DATA

PART 1 - GENERAL

1.01 Description

A. Extend existing system into remodeled spaces.

B. Provide complete data/telephone distribution system including CAT 5e conductors, devices with cover plates, boxes, terminal cabinets, etc., as indicated on Drawings.

1.02 Network Overview

A. The network of voice/data cabling is designed and will be constructed in a star, with the hub located in the Utility Room.

B. A horizontal CAT 5e cabling system connects the hub to the individual telephone/data jacks throughout the building.

C. All voice and data cabling, jacks, and patch panels will be CAT 5e. All cables are to terminate on contractor-furnished patch panels in the data rack. The layout of the data rack is to be verified with the owner prior to work.

1.03 Quality Assurance

A. Conform to requirements of serving utility.

B. UL Listed.

C. National Electrical Code with state and local amendments.

D. ANSI/TIA/EIA-568-A – Commercial Building Telecommunications Wiring Standard

E. EIA/TIA 569 – Commercial Building Standard for Telecommunications Pathways and Spaces.

F. EIA/TIA-607 – Commercial Building Grounding and Bonding Requirements for Telecommunications.

G. IEEE 802.3y – Physical layer specifications for 100Mb/s.

1.04 Submittals

A. Submit equipment data sheets and shop drawings in accordance with 26 0500, Shop Drawings and Materials Lists, Basic Electrical Materials and Methods.
B. Submit operation and maintenance data in accordance with 26 0500, Electrical Equipment Maintenance Manuals, Basic Electrical Materials and Methods.

PART 2 - PRODUCTS

2.01 Rough-in Materials

A. Outlet Boxes: 4” square, 2-1/8” deep minimum with 1-gang device ring.
B. Conduits: 1” minimum size with larger sizes as indicated on the Drawings.
C. Pull Boxes: Sheet metal, primed and painted, screw cover.
D. Telephone terminal backboards shall be 4’x8’x3/4” plywood with a grade of “AB” or higher. Plywood shall be fire-rated or painted with fire retardant paint as requested by utility. Mount with best side out. Backboards shall be smooth finished, sanded surface without significant blemishes. If the plywood is to be painted, prime and paint with two coats of white fire retardant paint, Benjamin Moore IronClad Retardo, or approved alternate.

2.02 Conductors

A. Unshielded twisted pair cable CAT 5e, 4-pair, 24 gauge copper unshielded twisted pair, PVC coated cable listed as complying with UL Type CM, C(UL) Type CM, ANSI/TIA/EIA-568-B.2 CAT 5e. Belden Data Twist 5e+.
B. Paired, 25 pairs, 24 AWG, solid BC – bare copper conductors, S-R PVC – Semi-rigid polyvinyl chloride insulation, unshielded, PVC jacket, jacket sequentially marked at 2 foot intervals.

2.03 Jacks

A. Panduit mini-com mini jack CAT5e with universal 568A or 568B pin-out. Verify color with Architect prior to order.

2.04 Face Plates

A. Panduit mini-com executive series vertical 2-port faceplates. Verify color with Architect prior to order. A blank of the same color is required for any ports not utilized during the installation of the network.

2.05 Patch Panels

A. Panduit DP5e 48 port with universal 568A or 568B pin out for data.

2.06 Wire Managers
Telephone and Computer Data  
27 2500–3  

A. Panduit Slotted Duct Horizontal Management System, 2-sided cable manager utilizing 2-rack spaces. The front manager shall measure 3”x3” and the rear manager shall measure 2”x4”. One above and below each patch panel that is installed.

PART 3 - EXECUTION

3.01 Inspection

A. Verify location of all telephone and data outlets with architectural Drawings prior to roughing-in. Where outlets occur at built-in counters, desks, and bookshelves coordinate with other trades.

B. Examine area to receive terminals and equipment to assure adequate clearance.

3.02 General Installation

A. Verify installation requirement with serving utility. Stub conduit up nominally six inch above floor or below ceiling at terminal facilities provided by Telephone Company and lock into metal template with locknuts and insulating bushings.

B. Underground Service: Provide conduit down pole, elbow at bottom of pole and conduit from pole to terminal location inside building. Conduit to continue up exterior of building and terminate inside building at designated location. Other exterior raceways as indicated on Drawings.

C. Conduit bends to be large radius field bends or factory ells. At wall outlets at frame or metal studs telephone connector place telephone connector inside wall cavity and not in surface mounted box located over telephone outlet. Thru wall box and conduits at these locations to be properly supported.

D. Provide pull-in line in all empty raceways

E. Anchor plywood terminal board to the building structure. Use of toggle bolts to attach to the sheetrock is not an acceptable means of support.

F. Provide ¾” raceway and #6 solid copper wire to main electrical ground bus for Telco ground. The demarcation point must be within 20 feet of the main electrical ground. Verify exact requirements with Utility.

G. Provide conduit from outlet box into accessible ceiling space. Conduit to include bushings and pull-in line.

3.03 Cabling Installation

A. Strict adherence shall be made to Manufacturer’s installation instructions and requirements. Where conflicts arise between the requirements of this specification and the manufacturer’s installation instructions, the Architect shall be consulted for resolution.
B. All wiring systems shall be installed according to related standards as listed within TIA/EIA-569. All installed cables shall be kept free from nicks, abrasions, and cuts during storage and installation. Defective wiring will be replaced at the Contractor’s expense in a manner that will not delay the progress of the project.

C. Installation shall provide minimal signal impairment by closely following manufacturer’s installation guidelines, and by preserving wire twists as closely as possible to the point of termination.

D. Installation shall be neat, well organized, and of professional quality, with wire management and termination practices in accordance with manufacturer’s guidelines. Cabling will be supported in the ceiling according to industry standard and manufacturer recommendations to minimize cross talk, EMI, and damage. Cabling is to be dressed and secured with Velcro Cable Ties from the point it enters the data room space to the point it enters the cable managers or is terminated.

E. All cables will be home run. Splicing of cables will not be accepted. All CAT 5e cables will be run to the data rack and terminated on the patch panel.

F. Leave 18” of coiled cable at each outlet, and 12” loosely coiled cable in the Horizontal Cable Manager in the data room in a way that does not kink the cable. Cable is to be installed in the data rack so the rack is not impaired, and can open to the fullest extent without cable interference.

G. Provide CAT 3, 25 pair cable from the TTB (demarc) to the data rack. Verify termination type with owner prior to installation. Provide a minimum of 10 feet of slack at each end of the cable (verify with owner).

3.04 Labeling

A. All cables shall be identified, by the Contractor, at both ends of the wiring run. Identification shall be made by legible, indelible marking on cable tags. Cable tags shall be affixed to the ends of each cable comprising the run. All tags are to be made for the purpose of labeling cables. The labels are to be done with a mechanical printing device such as a P-Touch or similar label maker. Hand written tags or labels are not acceptable.

B. Each cable shall be labeled at each end in the format given by the owner. The number shall be pre-printed on a cable tag, with the tag secured to the cable sheath no more than 4-inches from its termination. Verify labeling scheme to be used with the Owner or Architect

3.05 Testing

A. The Contractor shall perform all of the following tests, and provide all tools and instruments used to test the installed system. Test instruments used by the Contractor shall be suitable for the intended procedure and of industry-recognized standards.
B. The Contractor shall use a Fluke or equal twisted pair cable tester for the testing of all CAT 5e copper cabling installed in this contract. Provide test data in electronic format that does not require proprietary software to view and hard copy. The test results are to be placed into a 3-ring binder utilizing plastic sleeves with the test results in numeric or alphabetic order depending on labeling scheme used.

1. All cables shall be tested bi-directional for the following parameters: Wire map/continuity, length, attenuation, NEXT (near end cross talk), ELFEXT (equal level far end cross talk), delay and delay skew, return loss, and PSELFEXT (power sum equal level far end cross talk).

2. All test results are to meet the current industry standard for length and dB loss.

END OF SECTION
b. The system goes to improper ground.
c. The power is shut off to the local alarm signals in the building.
d. The tamper switch at an OS&Y valve has been activated.
e. An air compressor low-pressure switch has been activated.

3. An alarm or trouble shall be silenced by a code or Firefighter key at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur (subsequent alarm feature). When alarms are silenced the silenced LED on the control panel, and on any remote annunciators shall remain lit, until the alarmed device is returned to normal.

4. Provide 24 hour, 24 volt D.C. standby battery power source for system in case of power failure.

1.02 Related work in other sections includes:

A. Providing identification, Section 26 0500, Basic Electrical Materials and Methods.

B. Providing conductors, Section 26 0519, Conductors and Cables.

C. Providing raceways, Section 26 05330, Raceways and Boxes.

D. Providing flow switches, OS&Y valve monitoring switches (OS&Y tamper switches), air compressor low pressure switches, mechanical system ionization detectors (air duct detectors), Division 23.

E. Providing magnetic door holders, combination door closers and holders with integral smoke detector device, Division 08, Finish Hardware.

1.03 Related work by Owner: Providing telephone lines as required for transmitting signal to remote central station and making arrangements with the remote central station to receive the alarm signals.

1.04 Quality Assurance

A. The fire alarm equipment and installation shall comply with the current provisions of the following standards and shall be listed for its intended purpose and be compatibility listed to insure integrity of the complete system.

1. UL Listed: All equipment shall be approved by Underwriters Laboratories, Inc. for its intended purpose.


3. NEC Article 760 - Fire Alarm Systems.

5. Americans with Disabilities Act (ADA): All visual Notification appliances and manual pull stations shall comply with the requirements of the Americans with Disabilities Act.

6. Local and State Building Codes and Authorities Having Jurisdiction.

1.05 Submittals

A. Submit shop drawings, wiring diagrams and product data sheets in accordance with Division 01 or 26 0500, Shop Drawings & Material Lists, Basic Electrical Materials and Methods. As a minimum, submittal shall include:

1. Product Cutsheets
2. Battery Calculations
3. Voltage Drop Calculations
4. Input/Output matrix
5. Drafted plans showing layout of devices as designed by Manufacturer’s rep with additionally required devices as shown on Fire Alarm plans
6. Standard mounting height details
7. Special ceiling height and configuration details.

B. Submit plans and specifications to the local fire marshal. Obtain his written acceptance of the system prior to beginning work and ordering equipment.

C. Submit operation and maintenance data in accordance with Division 01 or 26 0500, Electrical Equipment Maintenance Manuals, Basic Electrical Materials and Methods. Minimum items to include:

1. Installation and Programming manuals for the installed Life Safety System.
2. Point by point diagrams of the entire Life Safety System as installed. This shall include all connected Smoke Detectors and addressable field modules.
3. All drawings must reflect device address as verified in the presence of the engineer and/or end user.

D. Have manufacturer submit on completion of system verification a point-by-point checklist indicating the date and time of each item inspected and issue a Certificate confirming that the inspection has been completed and the system is installed and functioning in accordance with the specifications.

1.06 Contractor Qualifications

A. Manufacturer's Approval: The Contractor shall be an authorized representative of the fire alarm manufacturer to install and service the manufacturer's equipment.
B. State Fire Marshal Licensing: The Contractor shall be licensed by the State Fire Marshal to install fire alarm systems. The Contractor's installation superintendent shall be licensed by the State Fire Marshal to supervise the installation of the fire alarm system.

1.07 Product Delivery, Storage & Handling

A. Deliver equipment with UL Label and bearing manufacturer's name.

B. Store and handle fire alarm equipment so as not to subject it to corrosion or mechanical damage and in a manner to prevent damage from environment and construction operation.

1.08 Warranty: Warranty all materials, installation and workmanship for a one (1) year period (365 days) from the date of final acceptance by the awarding authority, unless otherwise specified. Equipment or components showing inherent defects of a mechanical or electrical nature shall be replaced promptly at no expense to Owner providing it does not show abuse. A copy of the manufacturer warranty shall be provided with the close out documentation.

PART 2 - PRODUCTS

2.01 Alarm Initiation Devices:

A. Manual Fire Alarm Stations: Semi-flush mounted non-coded, non-break glass, double action type physically indicating operation until reset. Provide a locking device that when opened for test or fire drill purposes will activate the system. Provide all manual stations with keys, master keyed with all other equipment specified herein. Provide contact rating and arrangement compatible with the system operation characteristics. Provide with addressable modules as required.

B. Heat Detectors: Automatic heat detectors shall have a combination rate of rise and fixed temperature rated at 135 degrees Fahrenheit for areas where ambient temperatures do not exceed 100 degrees, and 200 degrees for areas where the temperature does not exceed 150 degrees (Mechanical Rooms). The rate of rise element shall consist of an air chamber, a flexible metal diaphragm, and a factory calibrated, moisture-proof, trouble free vent, and shall operate when the rate of temperature rise exceeds 15 degrees F per minute.

C. Smoke Detectors:

1. Automatic compliance with NFPA 72 standards for detector sensitivity testing.

2. Drift compensation to assure detector is operating correctly and maintenance alert when a detector nears the trouble condition.

3. Trouble alert when a detector is out of tolerance.
4. Provide addressable detectors, semi-flush ceiling mounted with twist-lock plug-in head.

5. The Smoke detector shall have a flashing status LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance.

6. The sensitivity of the detector shall be capable of being measured by the control panel without the need for external test apparatus.

7. The detector shall be a double EE-prom technology and be programmed using the internal programming loop located on the FACP. On command from the control panel, send data to the panel representing the analog level of products of combustion.

8. Provide detectors installed in elevator lobbies and machine rooms with auxiliary contacts for elevator control.

9. Ionization Detectors: Detectors shall use the dual-chamber ionization principal to measure products of combustion.

10. Photoelectric Smoke Detectors: Operating on a light scatter principle and set to detect smoke at a nominal 1.5 percent light obscuration per foot.

D. Air Duct Detectors: Provided duct detector, housing, and remote test switch as applicable to installed location. Provided by Division 16 with any necessary 120-volt connections. Installed with control wiring by Division 15.

E. Sprinkler system flow switches, OS&Y valve monitoring switches, air compressor low-pressure switches. Provided Under Division 15.

2.02 Alarm Indicating Devices:

A. Each indicating appliance circuit shall be electrically supervised for opens, grounds and short circuit faults, on the circuit wiring. The notification appliance (combination audible/visible units only) shall produce a peak sound output of 90dba or greater. The visible signaling appliance shall maintain a minimum flash rate of 1Hz or greater regardless or power input voltage. The appliance shall also be capable of meeting the candela requirements of each space as per NFPA and ADA

B. Combination audio/visual strobe and horns with white cover and red "FIRE" lettering. Semi-flush mounted in walls, flush mounted in ceilings as shown on drawings.

C. Combination strobe and speakers with white cover and red "FIRE" lettering. Semi-flush mounted in walls, flush mounted in ceilings as shown on drawings.

2.03 Auxiliary Relays: Zoned auxiliary relay contacts provided for proper interface with the HVAC, elevator and door controls as required per the drawings and specifications.
2.04 Magnetic Door Holders: Provided under Section 08710, Finish Hardware.

2.05 Combination Door Holders and Closers with Integral Smoke Detector: Provided under Section 08710, Finish Hardware.

2.06 Isolator Module
   A. Isolator modules shall be provided to automatically isolate wire-to-wire short circuits on an SLC loop. The isolator module shall limit the number of modules or detectors that may be rendered inoperative by a short circuit fault on the SLC Loop. At least one isolator module shall be provided for each floor or protected zone of the building.
   
   B. The isolator module shall mount in a standard 4-inch deep electrical box or in a surface mounted back box. It shall provide a single LED that shall flash to indicate that the isolator is operational and shall illuminate steadily to indicate that a short circuit condition has been detected and isolated.

2.07 Acceptable Manufacturers: Field verify with existing system.

PART 3 - EXECUTION

3.01 Inspection
   A. Verify all conditions on site and include in bid all materials and labor as required for the complete system.

3.02 Installation
   A. Contract Drawings indicate locations of fire alarm devices and annunciator panels. Provide wiring to connect all devices and annunciator panels to fire alarm control panel. Where subject to damage or required by code, provide wiring in conduit.
   
   B. Follow installation procedures and wiring recommendations of equipment manufacturer in accordance with NFPA 72, National Electrical Code and applicable state and local requirements.
   
   C. Wiring requirements, in general are as follows:
      1. The Fire Alarm Control Panel shall be connected to a separate dedicated branch circuit, maximum 20 amperes. This circuit shall be labeled as FIRE ALARM. Fire Alarm Control Panel Primary Power wiring shall be 12 AWG.
      2. It shall be the installer’s responsibility to coordinate with the supplier, regarding the correct wiring procedures before installing any conduits or conductors.
3. All wire used on the fire alarm system shall be U.L. Listed as fire alarm protection signaling circuit cable per National Electrical Code, Articles 760.

4. Install any 120-volt AC wiring needed for control of doors, fans, elevators, etc. within a metallic raceway system separate from 24 volt D.C. initiating a signaling wiring.

5. Provide minimum of 20 percent spare capacity in all circuits.

D. Flow switches, OS&Y tamper switches, air compressor low-pressure switches for sprinkler system provided by the Mechanical Contractor and connected to the fire alarm system by the Electrical Contractor. Verify connection and roughing-in requirements.

E. Verify location of fire detection thermostats and ionization detectors being provided by mechanical subcontractor at mechanical air handling units. At fire detection thermostats, relays to be provided in mechanical local control panels at Mechanical Rooms for connection to annunciator indicator lights at Mechanical System Fire Annunciators. Verify location of detectors and connect as shown or required.

F. End of line resistors to be installed in Storage Rooms, Mechanical Rooms, or accessible furred areas.

G. Provide signal connections to elevator controller as required.

H. From fire alarm control panel provide one 3/4-inch conduit with pull-in line to nearest telephone terminal board or panel location for tie-in to central station.

I. Magnetic door holders provided by others and connected to the Fire Alarm System by the Electrical Contractor as required.

J. Combination door closers and holders with integral smoke detector provided by others and connected to the Fire Alarm System by the Electrical Contractor as required. Verify connections and coordinate with the General Contractor.

K. All elevator recall and shunt trip devices shall be home run to the Fire Control Panel.

3.03 Testing

A. Prior to final test the fire department must be notified in accordance with local requirements.

B. Before the installation shall be considered completed and acceptable by the awarding authority, a test of the system shall be performed as follows:
1. The contractor’s job foreman, a representative of the owner, and the fire department shall operate every building fire alarm device to ensure proper operation and correct annunciation at the control panel.

2. At least one half of all tests shall be performed on battery standby power.

3. Where application of heat would destroy any detector, it may be manually activated.

4. The communication loops and the indicating appliance circuits shall be opened in at least two (2) locations per circuit to check for the presence of correct supervision circuitry.

C. When the testing has been completed to the satisfaction of both the contractor’s job foreman and owner, a notarized letter co-signed by each attesting to the satisfactory completion of said testing shall be forwarded to the owner and the fire department.

D. The contractor shall leave the fire alarm system in proper working order.

3.04 Cleaning

A. Clean all foreign matter from interior and exterior of fire alarm equipment and touch-up scratched or marred surfaces to match original finish.

END OF SECTION
SECTION 31-1000

SITE CLEARING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Clearing and protection of vegetation.
B. Demolition of existing structures to be removed and Removal of existing debris.

1.02 RELATED REQUIREMENTS

A. Section 01-1000 - Summary: Limitations on Contractor's use of site and premises.
B. Section 01-5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
C. Section 01-5713 - Temporary Erosion and Sediment Control.
D. Section 01-7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.
E. Section 31-2200 - Grading: Topsoil removal.
F. Section 31-2323 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: As specified in Section 31-2323 - Fill and Backfill

PART 3 EXECUTION

3.01 SITE CLEARING

A. Comply with other requirements specified in Section 01-7000.
B. Minimize production of dust due to clearing operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

3.02 EXISTING UTILITIES AND BUILT ELEMENTS

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. Protect existing structures and other elements that are not to be removed.
E. Call for utility locates prior to digging and wait for location field marks.

3.03 VEGETATION

A. Scope: Remove trees, shrubs, brush, and stumps in areas to be covered by paving, gravel shoulders, sidewalks, underground utilities, concrete apron, and other improvements shown on the Drawings.
B. Do not begin clearing until vegetation to be relocated has been removed.
C. Do not remove or damage vegetation beyond the limits indicated on drawings.
   1. 5 feet outside the of construction limits.
   2. Exception: Specific trees and vegetation indicated on drawings to be removed.
   3. Exception: Selective thinning of undergrowth specified elsewhere.
D. Install substantial, highly visible fences at least 3 feet high to prevent inadvertent damage to vegetation to remain:
   1. At vegetation removal limits.
2. Around trees to remain within vegetation removal limits; locate no closer to tree than at the drip line.
3. Around other vegetation to remain within vegetation removal limits.
4. See Section 01-5000 for fence construction requirements.

E. In areas where vegetation must be removed but no construction will occur other than pervious paving, remove vegetation with minimum disturbance of the subsoil.

F. Vegetation Removed: Do not burn, bury, landfill, or leave on site, except as indicated.
   1. Chip, grind, crush, or shred vegetation for mulching, composting, or other purposes; preference should be given to on-site uses.
   2. Trees: Sell if marketable; if not, treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   3. Existing Stumps: Treat as specified for other vegetation removed; remove stumps and roots to depth of 18 inches.
   4. Fill holes left by removal of stumps and roots, using suitable fill material, with top surface neat in appearance and smooth enough not to constitute a hazard to pedestrians.

G. Dead Wood: Remove all dead trees (standing or down), limbs, and dry brush in project area; treat as specified for vegetation removed.

H. Restoration: If vegetation outside removal limits or within specified protective fences is damaged or destroyed due to subsequent construction operations, replace at no cost to Owner.

3.04 DEBRIS
   A. Remove debris, junk, and trash from site.
   B. Break up as required and remove existing concrete designated for removal.
   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
SECTION 31-2200
GRADING

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Removal of topsoil.
   B. Rough grading the site for site structures.
   C. Finish grading.

1.02 RELATED REQUIREMENTS
   A. Section 31-2323 - Fill: Filling and compaction.
   B. Section 32-9219 - Seeding: Finish ground cover.
   C. Section 32-9300 - Plants: Topsoil in beds and pits.

PART 2 PRODUCTS
2.01 MATERIALS
   A. Topsoil: See Section 31-2323.
   B. Other Fill Materials: See Section 31-2323.

PART 3 EXECUTION
3.01 EXAMINATION
   A. Verify that survey benchmark and intended elevations for the Work are as indicated.
   B. Verify the absence of standing or ponding water.

3.02 PREPARATION
   A. Identify required lines, levels, contours, and datum.
   B. Stake and flag locations of known utilities.
   C. Locate, identify, and protect from damage above- and below-grade utilities to remain.
   D. Provide temporary means and methods to remove all standing or ponding water from areas prior to grading.
   E. Protect site features to remain, including but not limited to bench marks, survey control points, existing structures, fences, sidewalks, paving, and curbs, from damage by grading equipment and vehicular traffic.

3.03 ROUGH GRADING
   A. Remove topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.
   B. Do not remove topsoil when wet.
   C. Remove subsoil from areas to be further excavated, re-landscaped, or re-graded.
   D. Do not remove wet subsoil, unless it is subsequently processed to obtain optimum moisture content.
   E. When excavating through roots, perform work by hand and cut roots with sharp axe.
   F. Stability: Replace damaged or displaced subsoil to same requirements as for specified fill.
   G. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack surface water control.

3.04 FINISH GRADING
   A. Before Finish Grading:
      1. Verify building and trench backfilling have been inspected.
      2. Verify subgrade has been contoured and compacted.
B. Remove debris, roots, branches, stones, in excess of 1/2 inch in size. Remove soil contaminated with petroleum products.

C. Fine grade topsoil to eliminate uneven areas and low spots. Maintain profiles and contour of subgrade.

D. Maintain stability of topsoil during inclement weather. Replace topsoil in areas where surface water has eroded thickness below specifications.

3.05 TOLERANCES
   A. Top Surface of Subgrade: Plus or minus 0.10 foot (1-3/16 inches) from required elevation.
   B. Top Surface of Finish Grade: Plus or minus 0.04 foot (1/2 inch).
   C. Top Surface of Subgrade: Plus or minus 1/10 foot from required elevation.
   D. Top Surface of Finish Grade: Plus or minus 1/2 inch.

3.06 REPAIR AND RESTORATION
   A. Existing Facilities, Utilities, and Site Features to Remain: If damaged due to this work, repair or replace to original condition.

3.07 FIELD QUALITY CONTROL
   A. See Section 31-2323 for compaction density testing.

3.08 CLEANING
   A. Leave site clean and raked, ready to receive landscaping.

END OF SECTION
SECTION 31-2316
EXCAVATION

PART 1 GENERAL
1.01 SECTION INCLUDES
A. Excavating for building volume below grade and footings.
B. Trenching for utilities outside the building to utility main connections.

1.02 RELATED REQUIREMENTS
A. Section 31-2200 - Grading: Grading.
B. Section 31-2323 - Fill: Fill materials, backfilling, and compacting.

1.03 PROJECT CONDITIONS
A. Verify that survey bench mark and intended elevations for the Work are as indicated.

PART 2 PRODUCTS

PART 3 EXECUTION
3.01 EXCAVATING
A. Excavate to accommodate new structures and construction operations.
B. Notify Architect of unexpected subsurface conditions and discontinue affected Work in area until notified to resume work.
C. Preparation for Piling Work: Excavate to working elevations. Coordinate special requirements for piling.
D. Slope banks of excavations deeper than 4 feet to angle of repose or less until shored.
E. Cut utility trenches wide enough to allow inspection of installed utilities.
F. Hand trim excavations. Remove loose matter.
G. Correct areas that are over-excavated and load-bearing surfaces that are disturbed; see Section 31-2323.
H. Provide temporary means and methods, as required, to remove all water from excavations until directed by Architect. Remove and replace soils deemed suitable by classification and which are excessively moist due to lack of dewatering or surface water control.
I. Determine the prevailing groundwater level prior to excavation. If the proposed excavation extends less than 1 foot into the prevailing groundwater, control groundwater intrusion with perimeter drains routed to sump pumps, or as directed by the Architect. If the proposed excavation extends more than 1 foot into the excavation, control groundwater intrusion with a comprehensive dewatering procedures, or as directed by the Geotechnical Engineer.
J. Remove excavated material that is unsuitable for re-use from site.
K. Stockpile excavated material to be re-used in area designated on site 31-2200.
L. Remove excess excavated material from site.

END OF SECTION
SECTION 31-2323
FILL

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Filling, backfilling, and compacting for footings, paving, site structures, and utilities within the building.
B. Backfilling and compacting for utilities outside the building to utility main connections.
C. Filling holes, pits, and excavations generated as a result of removal (demolition) operations.
D. Fill for Working Pad during construction period.

1.02  RELATED REQUIREMENTS

A. Section 31-2200 - Grading: Removal and handling of soil to be re-used.
B. Section 31-2200 - Grading: Site grading.
C. Section 321123 - Aggregate Base Course.

1.03  REFERENCE STANDARDS


1.04  SUBMITTALS

A. See Section 01-3000 - Administrative Requirements, for submittal procedures.
B. Geotextile product data.

PART 2  PRODUCTS

2.01  FILL MATERIALS

A. General Structural Fill - Fill Type A: Conforming to a standard: well-graded aggregate 1 1/4 inch - 0 inch, with less than 5 percent passing the U.S. Standard No. 200 Sieve. Compact to at least 98 percent of the maximum dry density, as determined by ASTM D-698 (Standard Proctor).
   1. Locally available crushed rock and jaw-run crushed "shale" approved for Type A Structural Fill.
   2. Size: 1 inch minus typical, 4 inch minus at pavement sections as indicated in Drawings.
B. Granular Fill - Fill Type C: natural washed stone; free of shale, clay, friable material and debris, 1-1/2 inch.
   1. Graded in accordance with ASTM C136/C136M, within the following limits:
      a. 1 inch sieve: 100 percent passing.
      b. 3/4 inch sieve: 75 to 100 percent passing.
      c. No. 4 sieve: 0 to 10 percent passing.
      d. No. 50 sieve: 0 to 5 percent passing.
   2. Granular Fill - Fill Type C-1: drainage fill for placement directly behind Segmental Retaining Walls for drainage. Crushed rock.
      1. Graded in accordance with ASTM C136/C136M, within the following limits:
         a. 1 inch sieve: 100 percent passing.
         b. 3/4 inch sieve: 75 to 100 percent passing.
         c. No. 4 sieve: 0 to 10 percent passing.
         d. No. 50 sieve: 0 to 5 percent passing.
   D. Topsoil - Fill Type E: Topsoil excavated on-site.
      1. Free of roots, rocks larger than 1/2 inch, subsoil, debris, large weeds and foreign matter. Compact to at least 92 percent of the maximum dry density, as determined by ASTM D-698 (Standard Proctor).

2.02  ACCESSORIES

A. Geotextile Fabric: Non-biodegradable, non-woven; Amoco manufactured by Amoco Fabrics, distributed by ACF West.
   1. Flow Rate: 145 gal/min/sf.
4. Grab Tensile Elongation (ASTM D 4632): 50 %.
5. Amoco Style 4546 or equal.
6. Location: in areas as noted for filter drain fabric.

PART 3 EXECUTION

3.01 EXAMINATION
A. Identify required lines, levels, contours, and datum locations.
B. Verify areas to be filled are not compromised with surface or ground water.

3.02 PREPARATION
A. Scarify and proof roll subgrade surface to a depth of 6 inches to identify soft spots. Proofroll under the observation of the Architect. Perform with loaded 10 yard dump truck. Do not attempt during wet weather.
B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with Fill Type A.
C. Compact subgrade to at least 95 percent of the maximum dry density, as determined by ASTM D-698 (Standard Proctor).
D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.
E. Place Geotextile fabric at all pavement areas, over subgrade.
F. Provide 12 inch Fill Type A for a working surface for construction traffic and equipment prior to placement of base rock for paving to provide a "working pad". Baserock for paving can be placed in lieu of working pad if performed immediately after subgrade is proofrolled and approved for fill. Provide a 4 inch working pad within building footprint area and 5 feet beyond building line. All existing soil must be protected during construction with gravel working pad.

3.03 FILLING
A. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
B. Maintain optimum moisture content of fill materials to attain required compaction density.
C. Granular Fill: Place and compact materials in equal continuous layers not exceeding 8 inches compacted depth.
D. Soil Fill: Place and compact material in equal continuous layers not exceeding 8 inches compacted depth.
E. Slope grade away from building minimum 2 inches in 10 feet, unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
F. Correct areas that are over-excavated.
   1. Other areas: Use Fill Type A, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
G. Compaction Density Unless Otherwise Specified or Indicated:
   H. Reshape and re-compact fills subjected to vehicular traffic.
I. Maintain temporary means and methods, as required, to remove all water while fill is being placed as required, or until directed by the Architect. Remove and replace soils deemed unsuitable by classification and which are excessively moist due to lack of dewatering or surface water control.

3.04 FILL AT SPECIFIC LOCATIONS
A. At Foundation Walls and Footings:
   1. Use Fill Type A, B (see above for special requirements using on-site material for fill, or D.
   2. Fill up to subgrade elevation.
   3. Do not backfill against unsupported foundation walls.
B. At Drain Piping for drainage:
1. Cover, enclose drain piping with Fill Type C as shown in Drawings.

C. Over Subdrainage Piping at Foundation Perimeter:
   1. Drainage fill and geotextile fabric.
   2. Cover drainage fill with Fill Type A, B, D or E depending on location.

D. Over Buried Utility Piping, Conduits, and Duct Bank in Trenches: Refer to Detail Drawings and Site Utilities - Section 330000.
   1. Compact in maximum 8 inch lifts to 95 percent of maximum dry density.

E. At Lawn Areas:
   1. Use Fill Type E.
   2. Compact to 95 percent of maximum dry density.

F. At Planting Areas Other Than Lawns:
   1. Use Fill Type B and E.
   2. Fill up to 4 inches below finish grade with Fill Type B and to 1 inch below finish grade with Fill Type E.

3.05 TOLERANCES
   A. Top Surface of General Filling: Plus or minus 1/2 inch from required elevations.
   B. Top Surface of Filling Under Paved Areas: Plus or minus 1/4 inch from required elevations.

END OF SECTION