



CMBA ARCHITECTS
302 JONES STREET, SUITE 200
SIOUX CITY, IA 51101

PROJECT MANUAL

CENTRAL LYON COMMUNITY SCHOOL DISTRICT ELEMENTARY SCHOOL RESTROOM / LOCKER ROOM REMODEL - PHASE 2

ROCK RAPIDS, IOWA

CMBA Project #: SC19156

Date: February 3, 2020

CMBA Contact:

Scott Anderson, AIA
(P) (712) 274-2933

Owner:

Owner Contact:

Central Lyon Community School District
Brent Jorth, Superintendent
(P) (712) 472-2664

Mechanical Engineer:

Norm TeKrony, P.E.
Engineering Design Consultants (EDA)
(P) (712) 722-0228

Electrical Engineer:

Andy Landman, P.E.
Engineering Design Consultants (EDA)
(P) (712) 722-0228

SECTION 00 01 03 - PROJECT DIRECTORY**PART 1 GENERAL****1.01 SECTION INCLUDES**

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

1.02 OWNER:

- A. Name: Central Lyon Community School District.
1. Address Line 1: 1010 S. Greene Street.
 2. City: Rock Rapids.
 3. State: Iowa.
 4. Zip Code: 51246.
 5. Telephone: (712) 472-2664.
- B. Primary Contact: All correspondence from the Contractor to the Architect will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Title: Superintendent.
 2. Name: Brent Jorth
 3. Telephone: (712) 472-2664.

1.03 CONSULTANTS:

- A. Architect: Design Professional of Record. All correspondence from the Contractor regarding construction documents authored by Architect's consultants will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
1. Company Name: CMBA Architects.
 - a. Address Line 1: 302 Jones Street.
 - b. Address Line 2: Suite 200.
 - c. City: Sioux City.
 - d. State: Iowa.
 - e. Zip Code: 51101.
 - f. Telephone: (712) 274-2933.
 - g. Fax:(712) 248 -8648.
 2. Primary Contact: .
 - a. Title: Project Architect.
 - b. Name: Scott Anderson, AIA.
 - c. Email: anderson.s@cmbaarchitects.com.
- B. Mechanical Engineering Consultant - HVAC & Plumbing:
1. Company Name: Engineering Design Associates (EDA).
 - a. Address Line 1: 385 12th Street NE.
 - b. City: Sioux Center.
 - c. State: Iowa.
 - d. Telephone: (712) 722-0228.
 2. Primary Contact: .
 - a. Title: Mechanical Engineer.
 - b. Name: Norm TeKrony, PE.
- C. Electrical Engineering Consultant:
1. Company Name: EDA.
 - a. Address Line 1: 385 12th Street NE.
 - b. City: Sioux Center.
 - c. State: Iowa.
 - d. Zip Code: 51250.
 - e. Telephone: (712) 277-0228.
 2. Primary Contact: .
 - a. Title: Electrical Engineer.

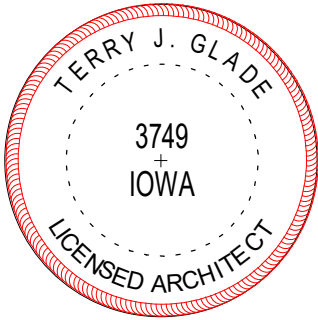
b. Name: Andy Landman, PE.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

I hereby certify that the portion of this technical submission described below was prepared by me or under my direct supervision and responsible charge. I am a duly Licensed Architect under the laws of the State of _____



Terry J. Glade

Signature _____

Date _____

Printed or typed name: **TERRY J. GLADE**

License Number: **3749**

My license renewal date is June 30, **2020**

Pages or sheets covered by this seal:

00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of

Norman Tekrony

2/3/2020

Signature

Date

Printed or typed name

Norman R. Tekrony

My License renewal date is

12/31/2021

Pages or sheets covered by this seal:

22, 23

Date Issued: 02/03/2020



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of

Andrew J. Landman

2/3/2020

Signature

Date

Printed or typed name

Andrew J. Landman

My License renewal date is

12/31/2020

Pages or sheets covered by this seal:

26, 28

Date Issued: 02/03/2020

SECTION 000110 - TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

000103	PROJECT DIRECTORY
000107	SEALS PAGE
000110	TABLE OF CONTENTS
001100	NOTICE OF BID LETTING
002113	INSTRUCTIONS TO BIDDERS & SUPPLEMENTARY INSTRUCTIONS
004000	PROCUREMENT FORMS AND SUPPLEMENTS
004100	BID FORM
	BIDDER STATUS FORM
004336	PROPOSED SUBCONTRACTOR LIST
007200	GENERAL CONDITIONS
	AIA A201-2007 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION
007300	SUPPLEMENTARY CONDITIONS

DIVISION 01 - GENERAL REQUIREMENTS

011000	SUMMARY
012000	PRICE AND PAYMENT PROCEDURES
012100	ALLOWANCES
012300	ALTERNATES
013000	ADMINISTRATIVE REQUIREMENTS
	THIRD PARTY USER AGREEMENT FOR ELECTRONIC DATA
013216	CONSTRUCTION PROGRESS SCHEDULE
014000	QUALITY REQUIREMENTS
014533	CODE-REQUIRED SPECIAL INSPECTIONS AND TESTING
015000	TEMPORARY FACILITIES AND CONTROLS
016000	PRODUCT REQUIREMENTS
016010	SUBSTITUTION PROCEDURES
016010.01	SUBSTITUTION REQUEST FORM
017000	EXECUTION AND CLOSEOUT REQUIREMENTS
017419	CONSTRUCTION WASTE MANAGEMENT
017800	CLOSEOUT SUBMITTALS
017900	DEMONSTRATION AND TRAINING

DIVISION 02 - EXISTING CONDITIONS

024100	DEMOLITION
--------	------------

DIVISION 03 - CONCRETE

033000	CAST-IN-PLACE CONCRETE
--------	------------------------

DIVISION 04 - MASONRY

042000	UNIT MASONRY
--------	--------------

DIVISION 05 - METALS

055000	METAL FABRICATIONS
--------	--------------------

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

061000	ROUGH CARPENTRY
--------	-----------------

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

079200	JOINT SEALANTS
--------	----------------

DIVISION 08 - OPENINGS

081113	HOLLOW METAL DOORS AND FRAMES
--------	-------------------------------

081416 FLUSH WOOD DOORS
087100 DOOR HARDWARE
089100 LOUVERS

DIVISION 09 - FINISHES

090561 COMMON WORK RESULTS FOR FLOORING PREPARATION
092116 GYPSUM BOARD ASSEMBLIES
093000 TILING
095100 ACOUSTICAL CEILINGS
096500 RESILIENT FLOORING
096813 TILE CARPETING
099123 INTERIOR PAINTING

DIVISION 10 - SPECIALTIES

102113.19 PLASTIC TOILET COMPARTMENTS
102800 TOILET, BATH, AND LAUNDRY ACCESSORIES

DIVISION 12 – FURNISHINGS (NOT USED)

DIVISION 13 - SPECIAL CONSTRUCTION (NOT USED)

DIVISION 14 - CONVEYING EQUIPMENT (NOT USED)

DIVISION 21 - FIRE SUPPRESSION (NOT USED)

DIVISION 22 – PLUMBING

22 05 00 PLUMBING COMMON REQUIREMENTS
22 05 10 BASIC MATERIALS AND METHODS
22 05 11 PLUMBING FIRESTOPPING
22 05 14 DEMOLITION
22 05 15 EXCAVATION FOR UTILITIES
22 05 23 VALVES
22 05 29 PIPE SUPPORTS AND ANCHORS
22 05 53 PLUMBING IDENTIFICATION
22 07 00 PLUMBING INSULATION
22 11 10 PLUMBING PIPES AND PIPE FITTINGS
22 40 00 PLUMBING FIXTURES AND EQUIPMENT

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

23 05 00 HVAC COMMON REQUIREMENTS
23 05 10 BASIC MATERIALS AND METHODS
23 05 13 ELECTRICAL PROVISIONS OF HVAC WORK
23 05 14 DEMOLITION
23 07 03 FIBERGLASS HVAC DUCT INSULATION
23 31 10 DUCT
23 33 00 DUCT ACCESSORIES
23 34 23 POWER ROOF VENTILATORS
23 37 13 GRILLES, REGISTERS & DIFFUSERS

DIVISION 26 - ELECTRICAL

26 01 00 GENERAL ELECTRICAL COMMON REQUIREMENTS
26 05 00 BASIC ELECTRICAL MATERIALS AND METHODS
26 05 19 CONDUCTORS AND CABLES
26 05 33 RACEWAYS AND BOXES
26 05 53 ELECTRICAL IDENTIFICATION
26 06 00 ELECTRICAL FIRESTOPPING

26 22 00 DRY TYPE TRANSFORMERS
26 24 16 PANELBOARDS
26 27 26 WIRING DEVICES
26 28 16 DISCONNECT SWITCHES
26 51 00 INTERIOR LED LIGHTING

DIVISION 27 - COMMUNICATIONS (NOT USED)

DIVISION 28 - ELECTRONIC SAFETY AND SECURITY

28 31 11 FIRE ALARM SYSTEMS

END OF SECTION

SECTION 001111
NOTICE OF BID LETTING

PART 1 BID LETTING

1.01 SEALED PROPOSALS WILL BE ACCEPTED BY THE SUPERINTENDENT AT HIGH SCHOOL BOARD ROOM, 1010 S. GREENE STREET, ROCK RAPIDS, IOWA 51246 UNTIL 12:00 PM (NOON) ON MARCH 5, 2020 AND AT SUCH TIME AND PLACE WILL BE OPENED AND PUBLICLY READ.

- A. Bids must be submitted on the approved Bid Form available in the Contract Documents or a printable electronic Bid Form is available from the Architect. No oral, facsimile, electronic or telephonic bids or modifications will be considered. Bids received after the deadline for submission of Bids as stated herein shall not be considered and shall be returned to the late Bidder unopened.
- B. Bids shall be accompanied by a Bidder Status Form, in the same envelope as the Bid Form.
- C. Each Bidder shall accompany its Bid with Bid Security, filed in a separate envelope, as security that the successful Bidder will enter into a Contract for the work bid upon in accordance with the Contract Documents and statutory requirements. The Bidder's security shall be in an amount equal to 5% of the total amount of the Base Bid and shall be in the form cash or a cashier's check or a certified check drawn on an FDIC insured bank in Iowa or an FDIC insured bank chartered under the laws of the United States; or a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States; or a Bid Bond and shall be made payable to Central Lyon Community School District and the proceeds retained as penalty if the Bidder fails to execute a contract and file acceptable Performance and Payment Bonds or provide an acceptable Certificate of Insurance within 10 days after the acceptance of such proposal by resolution of the Board.
- D. Consideration of the Bids received and the award of the Contract or other action may be made by the Board upon the proposals received in accordance with the law and the Contract Documents at its meeting to be held at 7:00 PM on March 9, 2020 at the High School Board Room or at such later time and date as may be fixed.
- E. Contract Documents may be examined at the office of the Architect, the office of the School Superintendent or obtained from the reprographer, Sioux City Blueprint (712) 258-6840 for a \$100 refundable deposit. Contract Documents may also be examined at the following Building Exchanges:
 - 1. Sioux City Construction League, 3900 Stadium Drive, Sioux City, IA 51106.
 - 2. Plains Builder's Exchange, 220 N. Kiwanis Ave., Sioux Falls, SD 57104.
 - 3. Sioux Falls Builder's Exchange, 1418 C Ave., Sioux Falls, SD 57104.
 - 4. North Iowa Builder's Exchange, 15 W. State Street, Mason City, IA 50401.
 - 5. Greater Fort Dodge Growth Alliance, 24 N. 9th Street, Fort Dodge, IA 50501.
 - 6. Omaha Builder's Exchange, 4159 S. 94th Street, Omaha, NE 68127.
 - 7. Master Builders of Iowa, 221 Park Street, Des Moines, IA 50309.
- F. Work under the proposed Contract shall be commenced upon receipt of signed Contract and shall be completed no later than September 15, 2020.
- G. The Board reserves the right to reject any and all proposals, re-advertise for new bids and to waive informalities that may be in the best interest of the School District.
- H. By virtue of statutory authority, a preference will be given to products and provisions grown and locally produced within the State of Iowa and to Iowa domestic labor.
- I. The successful Bidder will be required to furnish a Performance Bond, a separate Labor & Payment Bond, both in an amount equal to 100% of its Contract Price, and Insurance; said documents to be issued by a responsible Surety approved by the Board and shall guarantee the faithful performance of the Contract and the terms and conditions therein contained.
- J. Plans and Specifications governing the construction of said improvements have been prepared by CMBA Architects, Sioux City, Iowa which plans and specifications to and defining said

proposed improvements are hereby made a part of this Notice and the proposed contract shall be executed to comply therein.

- K. A PRE-BID CONFERENCE will be held at the Elementary School, 1105 South Story, Rock Rapids, Iowa 51246 on February 20, 2020 at 10:00 AM. All interested contractors, sub-contractors and material suppliers are encouraged to attend. The Owner, Architect and Consulting Engineers will be present to describe the Project and the schedule and answer questions. Attendance is not mandatory, but is recommended.

1.02 NOTICE IS POSTED UPON ORDER OF THE CENTRAL LYON COMMUNITY SCHOOL BOARD, ROCK RAPIDS, IOWA.

END OF SECTION

SECTION 002113
INSTRUCTIONS TO BIDDERS

SUMMARY

1.01 SEE AIA A701, INSTRUCTIONS TO BIDDERS BOUND IN THE PROJECT MANUAL.

1.02 THE INSTRUCTIONS IN THIS DOCUMENT AMEND OR SUPPLEMENT THE INSTRUCTIONS TO BIDDERS AND OTHER PROVISIONS OF THE BIDDING AND CONTRACT DOCUMENTS.

1.03 DOCUMENT INCLUDES

- A. Invitation to Bid, and other relevant information and requirements.
 - 1. Bid Submission
 - 2. Intent
 - 3. Contract Time
- B. Bid Documents and Contract Documents
 - 1. Definitions
 - 2. Contract Documents Identification
 - 3. Availability
 - 4. Examination
 - 5. Inquiries/Addenda
- C. Bid Submission
 - 1. Bid Depository
 - 2. Submission Procedure
- D. Bid Enclosures/Requirements
 - 1. Bidder Status Form (in the **same envelope**)
 - 2. Security Deposit (in a **separate envelope**)
 - 3. Bid Form Requirements
- E. Offer Acceptance/Rejection
 - 1. Duration of Offer
 - 2. Acceptance of Offer

1.04 RELATED DOCUMENTS

- A. Document 011000 - Summary.
- B. Document 004100 - Bid Form.
- C. Bidder Status Form
- D. Document 007300 - Supplementary Conditions

1.05 SUPPLEMENTARY INSTRUCTIONS**A. ARTICLE 2 - BIDDER'S REPRESENTATIONS**

- 1. Add Section 2.1.3.1: The Bidder has investigated all required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted Bid the costs of such fees, permits and requirements not otherwise indicated as provided by the Owner.
- 2. Add Section 2.1.5: The Bidder is a properly licensed Contractor according to the laws and regulations of the State of Iowa and meets qualifications indicated in the Procurement and Contracting Documents.

B. ARTICLE 4 - BIDDING PROCEDURES

- 1. Add Section 4.1.1.1: Printable electronic Bid forms and related documents are available from the Architect.
- 2. Add Section 4.1.9: Owner may elect to disqualify a bid due to failure to submit a bid in the form requested, failure to bid requested alternates or unit prices, failure to complete entries in all blanks in the Bid Form, or inclusion by the Bidder of any Alternates, conditions, limitations or provisions not called for.

3. Add Section 4.1.10: Bids shall not include sales and use taxes. The School District will obtain a "tax exemption certificate" from the State of Iowa and will furnish it to all Prime Contractors, Sub-Contractors and Suppliers. The tax exemption includes Iowa sales tax and any local option sales tax that may be applicable.
4. Add Section 4.2.4: Bid Security shall be in the form of cash, cashier's check, certified check, Credit Union certified Share Draft or a Bid Bond in an amount of at least five percent (5%) of the Base Bid. Checks shall be made payable to Central Lyon Community School District. Bid Bonds must be executed by corporations authorized to contract as surety in Iowa and in addition to all other provisions, clearly designate an Iowa resident agent as attorney-in-fact.
 - a. Bid Security shall be placed in a separate envelope from the envelope containing the Bid Form.
5. Add Section 4.5: Provide detailed cost breakdown no later than two (2) days following Architect's request.

C. ARTICLE 5 - CONSIDERATION OF BIDS

1. Add Section 5.2.1: The Owner reserves the right to reject a bid based on Owner's and Architect's evaluation of qualification information submitted following the opening of Bids. The evaluation of the Bidder's qualifications will include:
 - a. Status of licensure and record of compliance with licensing requirements.
 - b. Record of quality of completed work.
 - c. Record of project completion and ability to complete Project.
 - d. Record of financial management including financial resources available to complete Project.
 - e. Record of timely payment of obligations.
 - f. Record of project site management including compliance with requirements of authorities having jurisdiction.
 - g. Record of and number of current claims and disputes and the status of their resolution.
 - h. Qualifications of the Bidder's proposed Project Staff and proposed sub-contractors.

D. ARTICLE 7 - PERFORMANCE BOND AND PAYMENT BOND

1. Add Section 7.1.1.1: Both a Performance Bond and a Payment Bond will be required, each in an amount equal to one hundred percent (100%) of the Contract Sum.
2. Section 7.2.1: Delete the first sentence and insert the following:
 - a. "The Bidder shall deliver the required bonds to the Owner no later than ten (10) days after the Date of Notice of Intent to Award and no later than the date of execution of the Contract, whichever occurs first. Owner may deem the failure of the Bidder to deliver required bonds within the period of time allowed a default".

E. ADD ARTICLE 9 - EXECUTION OF THE CONTRACT

1. Add Section 9.1.1: Unless otherwise indicated in the Procurement and Contracting Documents or the executed Agreement, the date of commencement of the Work shall be the date of the executed Agreement.
2. Add Section 9.1.2: In the event of a default, the Owner may declare the amount of the Bid Security forfeited and elect to either award the Contract to the next lowest responsible Bidder or re-advertise for Bids.

F. PREBID CONFERENCE

1. A Pre-Bid Conference will be held at the Elementary School, 1105 South Story, Rock Rapids, Iowa 51246 on February 20, 2020 at 10:00 AM.
2. All interested contractors, sub-contractors, and material suppliers are encouraged to attend. Attendance is not mandatory, but it is recommended.
3. The Owner, Architect, and Consulting Engineers will be present to describe the Project and the schedule and answer questions.

END OF SECTION

AIA[®] Document A701[™] – 1997

Instructions to Bidders

for the following PROJECT:

(Name and location or address)

Central Lyon Community School District - Elementary School Restroom Remodel
1010 S Greene Street
Rock Rapids, IA 51246

THE OWNER:

(Name, legal status and address)

Central Lyon Community School District
1010 South Greene Street
Rock Rapids, IA 51246

THE ARCHITECT:

(Name, legal status and address)

Cannon Moss Brygger & Associates P.C. dba CMBA Architects P.C.
302 Jones St. Suite 200
Sioux City, IA 51101

TABLE OF ARTICLES

- | | |
|---|---|
| 1 | DEFINITIONS |
| 2 | BIDDER'S REPRESENTATIONS |
| 3 | BIDDING DOCUMENTS |
| 4 | BIDDING PROCEDURES |
| 5 | CONSIDERATION OF BIDS |
| 6 | POST-BID INFORMATION |
| 7 | PERFORMANCE BOND AND PAYMENT BOND |
| 8 | FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR |

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.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 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.

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

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

§ 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will 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 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. 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.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

§ 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

§ 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, 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.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

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

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

§ 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

§ 4.4.3 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

§ 4.4.4 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

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

§ 5.2 REJECTION OF BIDS

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

§ 5.3 ACCEPTANCE OF BID (AWARD)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

§ 5.3.2 The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

§ 6.2 OWNER'S FINANCIAL CAPABILITY

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 SUBMITTALS

§ 6.3.1 The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1) withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 BOND REQUIREMENTS

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

§ 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 If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

§ 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 be commenced prior thereto 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. Both bonds shall be written in the amount of the Contract Sum.

§ 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 thereto a certified and current copy of the power of attorney.

ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

**SECTION 004000
PROCUREMENT FORMS AND SUPPLEMENTS**

PART 1 GENERAL

**1.01 CONTRACTOR IS RESPONSIBLE FOR OBTAINING A VALID LICENSE TO USE ALL
COPYRIGHTED DOCUMENTS SPECIFIED BUT NOT INCLUDED IN THE PROJECT MANUAL.**

1.02 FORMS

- A. Use the following forms for the specified purposes unless otherwise indicated elsewhere in the procurement requirements.
- B. Instructions to Bidders: AIA A701.
- C. Substitution Request Form (During Bidding and Construction): Section 01 60 10.01.
- D. Bid Form: Section 004100 - Bid Form.
- E. Procurement Form Supplements:
 - 1. Bid Security Form: AIA A310.
 - 2. Proposed Schedule of Values Form: AIA G703.

1.03 REFERENCE STANDARDS

- A. AIA A310 - Bid Bond.
- B. AIA A701 - Instructions to Bidders.
- C. AIA G703 - Continuation Sheet.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 004100

BID FORM

THE PROJECT AND THE PARTIES

1.01 TO:

- A. Owner
 Central Lyon Community School District
 1010 S. Greene Street
 Rock Rapids, Iowa 51246

1.02 FOR:

- A. Project: Elementary School Restroom / Locker Room Remodel - Phase 2
- B. Architect's Project Number: SC19156

1.03 DATE: _____ (BIDDER TO ENTER DATE)

1.04 SUBMITTED BY: (BIDDER TO ENTER NAME AND ADDRESS)

- A. Bidder's Full Name _____
 - 1. Address _____
 - 2. City, State, Zip: _____
 - 3. Phone: _____

1.05 OFFER

- A. Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by CMBA Architects and their consultants for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:
- B. _____ dollars
 (\$ _____), in lawful money of the United States of America.
- C. We have included the required security deposit in a **Separate Envelope** as required by the Instruction to Bidders.
- D. All applicable federal taxes are included and State of Iowa taxes are excluded from the Bid Sum.
- E. All Cash and Contingency Allowances described in Section 012100 - Allowances are included in the Bid Sum.

1.06 ACCEPTANCE

- A. This offer shall be open to acceptance and is irrevocable for thirty days from the bid closing date.
- B. If this bid is accepted by Owner within the time period stated above, we will:
 - 1. Execute the Agreement within seven (7) days of receipt of Notice of Award.
 - 2. Furnish the required bonds within seven (7) days of receipt of Notice of Award.
 - 3. Commence work within seven (7) days after written Notice to Proceed of this bid.
- C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
- D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

1.07 CONTRACT TIME

- A. If this Bid is accepted, we will:

- B. Commence work on or around the 1st day of June, 2020.
- C. Have all plumbing work that requires water service to the school to be shut down completed by the 15th day of August, 2020.
 - 1. School start date will be Monday August 24, 2020.
- D. Have Substantial Completion of the Work by the 15th day of September, 2020.

1.08 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 _____
 - 4. Addendum # __ Dated _____

1.09 BID FORM SUPPLEMENTS

- A. **Bidder Status Form:** Bidder must submit this form with their Bid Form. It follows this Bid Form Document.
- B. We agree to submit the following Supplements to Bid Forms within 48 hours after submission of this bid for additional bid information:
 - 1. Document 004336 - Proposed Subcontractors Form: Include the names of all Subcontractors and the portions of the Work they will perform.
 - 2. Document 004373 - Proposed Schedule of Values Form identifies the Bid Price/Sum segmented into portions as requested.

1.10 BID FORM SIGNATURE(S)

- A. The Corporate Seal of
- B. _____
(Bidder - print the full name of your firm)
- C. was hereunto affixed in the presence of:
- D. _____
(Authorized signing officer, Title)
- E. (Seal)
- F. _____
- G. (Authorized signing officer, Title)

END OF SECTION

Bidder Status Form

To be completed by all bidders

Part A

Please answer "Yes" or "No" for each of the following:

- Yes No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).
- Yes No My company has an office to transact business in Iowa.
- Yes No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- Yes No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
- Yes No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: ____ / ____ / ____ to ____ / ____ / ____ Address: _____

City, State, Zip: _____

Dates: ____ / ____ / ____ to ____ / ____ / ____ Address: _____

City, State, Zip: _____

Dates: ____ / ____ / ____ to ____ / ____ / ____ Address: _____

You may attach additional sheet(s) if needed. City, State, Zip: _____

To be completed by non-resident bidders

Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company's home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers? Yes No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders

Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156. This form has been approved by the Iowa Labor Commissioner.

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- Yes No My business is currently registered as a contractor with the Iowa Division of Labor.
- Yes No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- Yes No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- Yes No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- Yes No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.
- Yes No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- Yes No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- Yes No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.
- Yes No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- Yes No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- Yes No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

**SECTION 004336
PROPOSED SUBCONTRACTORS FORM**

PARTICULARS

1.01 HEREWITH IS THE LIST OF SUBCONTRACTORS REFERENCED IN THE BID SUBMITTED BY:

1.02 (BIDDER) _____

1.03 TO (OWNER): CENTRAL LYON COMMUNITY SCHOOL DISTRICT

1.04 DATED _____ AND WHICH IS AN INTEGRAL PART OF THE BID FORM.

1.05 THE FOLLOWING WORK WILL BE PERFORMED (OR PROVIDED) BY SUBCONTRACTORS AND COORDINATED BY US:

LIST OF SUBCONTRACTORS

WORK SUBJECT SUBCONTRACTOR NAME

- A. Masonry: _____
- B. Demolition: _____
- C. Plumbing: _____
- D. Electrical: _____
- E. HVAC: _____
- F. Tile: _____
- G. Cast-in-Place Concrete: _____

END OF SECTION

**SECTION 007200
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 007300 - SUPPLEMENTARY CONDITIONS.

SUPPLEMENTARY CONDITIONS

3.01 REFER TO DOCUMENT 007300 - SUPPLEMENTARY CONDITIONS FOR AMENDMENTS TO THESE GENERAL CONDITIONS.

END OF SECTION

AIA[®] Document A201[™] – 2007

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

Central Lyon Community School District - Elementary School Restroom Remodel
1010 S Greene Street
Rock Rapids, IA 51246

THE OWNER:

(Name, legal status and address)

Central Lyon Community School District
1010 South Greene Street
Rock Rapids, IA 51246

THE ARCHITECT:

(Name, legal status and address)

Cannon Moss Brygger & Associates P.C. dba CMBA Architects P.C.
302 Jones St. Suite 200
Sioux City, IA 51101

TABLE OF ARTICLES

1	GENERAL PROVISIONS
2	OWNER
3	CONTRACTOR
4	ARCHITECT
5	SUBCONTRACTORS
6	CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
7	CHANGES IN THE WORK
8	TIME
9	PAYMENTS AND COMPLETION
10	PROTECTION OF PERSONS AND PROPERTY
11	INSURANCE AND BONDS
12	UNCOVERING AND CORRECTION OF WORK
13	MISCELLANEOUS PROVISIONS
14	TERMINATION OR SUSPENSION OF THE CONTRACT
15	CLAIMS AND DISPUTES

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.

Init.

/

AIA Document A201[™] – 2007. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997 and 2007 by The American Institute of Architects. All rights reserved. **WARNING: This AIA[®] Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA[®] Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 17:23:20 ET on 01/31/2019 under Order No.0215107102 which expires on 01/17/2020, and is not for resale.

User Notes:

(877159524)

INDEX

(Topics and numbers in bold are section headings.)

Acceptance of Nonconforming Work

9.6.6, 9.9.3, **12.3**

Acceptance of Work

9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3

Access to Work

3.16, 6.2.1, 12.1

Accident Prevention

10

Acts and Omissions

3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5,
10.2.8, 13.4.2, 13.7, 14.1, 15.2

Addenda

1.1.1, 3.11

Additional Costs, Claims for

3.7.4, 3.7.5, 6.1.1, 7.3.7.5, 10.3, 15.1.4

Additional Inspections and Testing

9.4.2, 9.8.3, 12.2.1, **13.5**

Additional Insured

11.1.4

Additional Time, Claims for

3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, **15.1.5**

Administration of the Contract

3.1.3, **4.2**, 9.4, 9.5

Advertisement or Invitation to Bid

1.1.1

Aesthetic Effect

4.2.13

Allowances

3.8, 7.3.8

All-risk Insurance

11.3.1, 11.3.1.1

Applications for Payment

4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5.1, 9.6.3, 9.7, 9.10, 11.1.3

Approvals

2.1.1, 2.2.2, 2.4, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10,

4.2.7, 9.3.2, 13.5.1

Arbitration

8.3.1, 11.3.10, 13.1, 15.3.2, **15.4**

ARCHITECT

4

Architect, Definition of

4.1.1

Architect, Extent of Authority

2.4, 3.12.7, 4.1, 4.2, 5.2, 6.3, 7.1.2, 7.3.7, 7.4, 9.2,
9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1,
13.5.1, 13.5.2, 14.2.2, 14.2.4, 15.1.3, 15.2.1

Architect, Limitations of Authority and Responsibility

2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3,
4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2,
9.5.3, 9.6.4, 15.1.3, 15.2

Architect's Additional Services and Expenses

2.4, 11.3.1.1, 12.2.1, 13.5.2, 13.5.3, 14.2.4

Architect's Administration of the Contract

3.1.3, 4.2, 3.7.4, 15.2, 9.4.1, 9.5

Architect's Approvals

2.4, 3.1.3, 3.5, 3.10.2, 4.2.7

Architect's Authority to Reject Work

3.5, 4.2.6, 12.1.2, 12.2.1

Architect's Copyright

1.1.7, 1.5

Architect's Decisions

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3,
7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1,
13.5.2, 15.2, 15.3

Architect's Inspections

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.5

Architect's Instructions

3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.5.2

Architect's Interpretations

4.2.11, 4.2.12

Architect's Project Representative

4.2.10

Architect's Relationship with Contractor

1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5,
3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18,
4.1.2, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5,
9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.4.2, 13.5, 15.2

Architect's Relationship with Subcontractors

1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3.7

Architect's Representations

9.4.2, 9.5.1, 9.10.1

Architect's Site Visits

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5

Asbestos

10.3.1

Attorneys' Fees

3.18.1, 9.10.2, 10.3.3

Award of Separate Contracts

6.1.1, 6.1.2

Award of Subcontracts and Other Contracts for Portions of the Work

5.2

Basic Definitions

1.1

Bidding Requirements

1.1.1, 5.2.1, 11.4.1

Binding Dispute Resolution

9.7, 11.3.9, 11.3.10, 13.1, 15.2.5, 15.2.6.1, 15.3.1,
15.3.2, 15.4.1

Boiler and Machinery Insurance

11.3.2

Bonds, Lien

7.3.7.4, 9.10.2, 9.10.3

Bonds, Performance, and Payment

7.3.7.4, 9.6.7, 9.10.3, 11.3.9, **11.4**

Building Permit

3.7.1

Init.

AIA Document A201™ – 2007. Copyright © 1911, 1915, 1918, 1925, 1937, 1951, 1958, 1961, 1963, 1966, 1970, 1976, 1987, 1997 and 2007 by The American Institute of Architects. All rights reserved. **WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.** This document was produced by AIA software at 17:23:20 ET on 01/31/2019 under Order No.0215107102 which expires on 01/17/2020, and is not for resale.

User Notes:

(877159524)

INDEX

(Topics and numbers in bold are Section headings.)

Acceptance of Nonconforming Work

9.6.6, 9.9.3, 12.3

Acceptance of Work

9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3

Access to Work

3.16, 6.2.1, 12.1

Accident Prevention

10

Acts and Omissions

3.2, 3.3.2, 3.12.8, 3.18, 4.2.3, 8.3.1, 9.5.1, 10.2.5, 10.2.8, 13.3.2, 14.1, 15.1.2, 15.2

Addenda

1.1.1

Additional Costs, Claims for

3.7.4, 3.7.5, 10.3.2, 15.1.5

Additional Inspections and Testing

9.4.2, 9.8.3, 12.2.1, 13.4

Additional Time, Claims for

3.2.4, 3.7.4, 3.7.5, 3.10.2, 8.3.2, 15.1.6

Administration of the Contract

3.1.3, 4.2, 9.4, 9.5

Advertisement or Invitation to Bid

1.1.1

Aesthetic Effect

4.2.13

Allowances

3.8

Applications for Payment

4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5.1, 9.5.4, 9.6.3, 9.7, 9.10

Approvals

2.1.1, 2.3.1, 2.5, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10.1, 4.2.7, 9.3.2, 13.4.1

Arbitration

8.3.1, 15.3.2, 15.4

ARCHITECT

4

Architect, Definition of

4.1.1

Architect, Extent of Authority

2.5, 3.12.7, 4.1.2, 4.2, 5.2, 6.3, 7.1.2, 7.3.4, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.4.1, 13.4.2, 14.2.2, 14.2.4, 15.1.4, 15.2.1

Architect, Limitations of Authority and Responsibility

2.1.1, 3.12.4, 3.12.8, 3.12.10, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 4.2.6, 4.2.7, 4.2.10, 4.2.12, 4.2.13, 5.2.1, 7.4, 9.4.2, 9.5.4, 9.6.4, 15.1.4, 15.2

Architect's Additional Services and Expenses

2.5, 12.2.1, 13.4.2, 13.4.3, 14.2.4

Architect's Administration of the Contract

3.1.3, 3.7.4, 15.2, 9.4.1, 9.5

Architect's Approvals

2.5, 3.1.3, 3.5, 3.10.2, 4.2.7

Architect's Authority to Reject Work

3.5, 4.2.6, 12.1.2, 12.2.1

Architect's Copyright

1.1.7, 1.5

Architect's Decisions

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 4.2.14, 6.3, 7.3.4, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4.1, 9.5, 9.8.4, 9.9.1, 13.4.2, 15.2

Architect's Inspections

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 13.4

Architect's Instructions

3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.4.2

Architect's Interpretations

4.2.11, 4.2.12

Architect's Project Representative

4.2.10

Architect's Relationship with Contractor

1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.7.5, 3.9.2, 3.9.3, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.2, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3, 12, 13.3.2, 13.4, 15.2

Architect's Relationship with Subcontractors

1.1.2, 4.2.3, 4.2.4, 4.2.6, 9.6.3, 9.6.4, 11.3

Architect's Representations

9.4.2, 9.5.1, 9.10.1

Architect's Site Visits

3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4

Asbestos

10.3.1

Attorneys' Fees

3.18.1, 9.6.8, 9.10.2, 10.3.3

Award of Separate Contracts

6.1.1, 6.1.2

Award of Subcontracts and Other Contracts for Portions of the Work

5.2

Basic Definitions

1.1

Bidding Requirements

1.1.1

Binding Dispute Resolution

8.3.1, 9.7, 11.5, 13.1, 15.1.2, 15.1.3, 15.2.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.3.3, 15.4.1

Bonds, Lien

7.3.4.4, 9.6.8, 9.10.2, 9.10.3

Bonds, Performance, and Payment

7.3.4.4, 9.6.7, 9.10.3, 11.1.2, 11.1.3, 11.5

Building Information Models Use and Reliance

1.8

Building Permit

3.7.1

Capitalization

1.3

Certificate of Substantial Completion

9.8.3, 9.8.4, 9.8.5

Init.

Certificates for Payment
4.2.1, 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.4

Certificates of Inspection, Testing or Approval
13.4.4

Certificates of Insurance
9.10.2

Change Orders
1.1.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11, 3.12.8, 4.2.8, 5.2.3, 7.1.2, 7.1.3, 7.2, 7.3.2, 7.3.7, 7.3.9, 7.3.10, 8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.2, 11.5, 12.1.2

Change Orders, Definition of
7.2.1

CHANGES IN THE WORK
2.2.2, 3.11, 4.2.8, 7, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1, 11.5

Claims, Definition of
15.1.1

Claims, Notice of
1.6.2, 15.1.3

CLAIMS AND DISPUTES
3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, 15, 15.4

Claims and Timely Assertion of Claims
15.4.1

Claims for Additional Cost
3.2.4, 3.3.1, 3.7.4, 7.3.9, 9.5.2, 10.2.5, 10.3.2, 15.1.5

Claims for Additional Time
3.2.4, 3.3.1, 3.7.4, 6.1.1, 8.3.2, 9.5.2, 10.3.2, 15.1.6

Concealed or Unknown Conditions, Claims for
3.7.4

Claims for Damages
3.2.4, 3.18, 8.3.3, 9.5.1, 9.6.7, 10.2.5, 10.3.3, 11.3, 11.3.2, 14.2.4, 15.1.7

Claims Subject to Arbitration
15.4.1

Cleaning Up
3.15, 6.3

Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3, 6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.2, 15.1.5

Commencement of the Work, Definition of
8.1.2

Communications
3.9.1, 4.2.4

Completion, Conditions Relating to
3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1, 9.10, 12.2, 14.1.2, 15.1.2

COMPLETION, PAYMENTS AND
9

Completion, Substantial
3.10.1, 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3, 12.2, 15.1.2

Compliance with Laws
2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3

Concealed or Unknown Conditions
3.7.4, 4.2.8, 8.3.1, 10.3

Conditions of the Contract
1.1.1, 6.1.1, 6.1.4

Consent, Written
3.4.2, 3.14.2, 4.1.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 13.2, 15.4.4.2

Consolidation or Joinder
15.4.4

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS
1.1.4, 6

Construction Change Directive, Definition of
7.3.1

Construction Change Directives
1.1.1, 3.4.2, 3.11, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, 7.3, 9.3.1.1

Construction Schedules, Contractor's
3.10, 3.11, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2

Contingent Assignment of Subcontracts
5.4, 14.2.2.2

Continuing Contract Performance
15.1.4

Contract, Definition of
1.1.2

CONTRACT, TERMINATION OR SUSPENSION OF THE
5.4.1.1, 5.4.2, 11.5, 14

Contract Administration
3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating to
3.7.1, 3.10, 5.2, 6.1

Contract Documents, Copies Furnished and Use of
1.5.2, 2.3.6, 5.3

Contract Documents, Definition of
1.1.1

Contract Sum
2.2.2, 2.2.4, 3.7.4, 3.7.5, 3.8, 3.10.2, 5.2.3, 7.3, 7.4, 9.1, 9.2, 9.4.2, 9.5.1.4, 9.6.7, 9.7, 10.3.2, 11.5, 12.1.2, 12.3, 14.2.4, 14.3.2, 15.1.4.2, 15.1.5, 15.2.5

Contract Sum, Definition of
9.1

Contract Time
1.1.4, 2.2.1, 2.2.2, 3.7.4, 3.7.5, 3.10.2, 5.2.3, 6.1.5, 7.2.1.3, 7.3.1, 7.3.5, 7.3.6, 7, 7, 7.3.10, 7.4, 8.1.1, 8.2.1, 8.2.3, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 12.1.2, 14.3.2, 15.1.4.2, 15.1.6.1, 15.2.5

Contract Time, Definition of
8.1.1

CONTRACTOR
3

Contractor, Definition of
3.1, 6.1.2

Contractor's Construction and Submittal Schedules
3.10, 3.12.1, 3.12.2, 4.2.3, 6.1.3, 15.1.6.2

Contractor's Employees

Init.

2.2.4, 3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6,
10.2, 10.3, 11.3, 14.1, 14.2.1.1
Contractor's Liability Insurance
11.1
Contractor's Relationship with Separate Contractors
and Owner's Forces
3.12.5, 3.14.2, 4.2.4, 6, 11.3, 12.2.4
Contractor's Relationship with Subcontractors
1.2.2, 2.2.4, 3.3.2, 3.18.1, 3.18.2, 4.2.4, 5, 9.6.2,
9.6.7, 9.10.2, 11.2, 11.3, 11.4
Contractor's Relationship with the Architect
1.1.2, 1.5, 2.3.3, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2,
3.5.1, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.2, 5.2,
6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6,
10.3, 11.3, 12, 13.4, 15.1.3, 15.2.1
Contractor's Representations
3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2
Contractor's Responsibility for Those Performing the
Work
3.3.2, 3.18, 5.3, 6.1.3, 6.2, 9.5.1, 10.2.8
Contractor's Review of Contract Documents
3.2
Contractor's Right to Stop the Work
2.2.2, 9.7
Contractor's Right to Terminate the Contract
14.1
Contractor's Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2,
9.8.3, 9.9.1, 9.10.2, 9.10.3
Contractor's Superintendent
3.9, 10.2.6
Contractor's Supervision and Construction
Procedures
1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4,
7.1.3, 7.3.4, 7.3.6, 8.2, 10, 12, 14, 15.1.4
Coordination and Correlation
1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1
Copies Furnished of Drawings and Specifications
1.5, 2.3.6, 3.11
Copyrights
1.5, 3.17
Correction of Work
2.5, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2, 12.3,
15.1.3.1, 15.1.3.2, 15.2.1
Correlation and Intent of the Contract Documents
1.2
Cost, Definition of
7.3.4
Costs
2.5, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3,
7.3.3.3, 7.3.4, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6,
11.2, 12.1.2, 12.2.1, 12.2.4, 13.4, 14
Cutting and Patching
3.14, 6.2.5
Damage to Construction of Owner or Separate
Contractors
3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 12.2.4

Damage to the Work
3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4, 12.2.4
Damages, Claims for
3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.3.2,
11.3, 14.2.4, 15.1.7
Damages for Delay
6.2.3, 8.3.3, 9.5.1.6, 9.7, 10.3.2, 14.3.2
Date of Commencement of the Work, Definition of
8.1.2
Date of Substantial Completion, Definition of
8.1.3
Day, Definition of
8.1.4
Decisions of the Architect
3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 6.3, 7.3.4,
7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.4.2,
14.2.2, 14.2.4, 15.1, 15.2
Decisions to Withhold Certification
9.4.1, 9.5, 9.7, 14.1.1.3
Defective or Nonconforming Work, Acceptance,
Rejection and Correction of
2.5, 3.5, 4.2.6, 6.2.3, 9.5.1, 9.5.3, 9.6.6, 9.8.2, 9.9.3,
9.10.4, 12.2.1
Definitions
1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 5.1,
6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1, 15.1.1
Delays and Extensions of Time
3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7,
10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
Digital Data Use and Transmission
1.7
Disputes
6.3, 7.3.9, 15.1, 15.2
Documents and Samples at the Site
3.11
Drawings, Definition of
1.1.5
Drawings and Specifications, Use and Ownership of
3.11
Effective Date of Insurance
8.2.2
Emergencies
10.4, 14.1.1.2, 15.1.5
Employees, Contractor's
3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2,
10.3.3, 11.3, 14.1, 14.2.1.1
Equipment, Labor, or Materials
1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3,
9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
Execution and Progress of the Work
1.1.3, 1.2.1, 1.2.2, 2.3.4, 2.3.6, 3.1, 3.3.1, 3.4.1, 3.7.1,
3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.6, 8.2, 9.5.1,
9.9.1, 10.2, 10.3, 12.1, 12.2, 14.2, 14.3.1, 15.1.4
Extensions of Time
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2,
10.4, 14.3, 15.1.6, 15.2.5

Init.

Failure of Payment
 9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
 Faulty Work
 (See Defective or Nonconforming Work)
 Final Completion and Final Payment
 4.2.1, 4.2.9, 9.8.2, 9.10, 12.3, 14.2.4, 14.4.3
 Financial Arrangements, Owner's
 2.2.1, 13.2.2, 14.1.1.4
GENERAL PROVISIONS
 1
 Governing Law
 13.1
 Guarantees (See Warranty)
 Hazardous Materials and Substances
 10.2.4, 10.3
 Identification of Subcontractors and Suppliers
 5.2.1
 Indemnification
 3.17, 3.18, 9.6.8, 9.10.2, 10.3.3, 11.3
 Information and Services Required of the Owner
 2.1.2, 2.2, 2.3, 3.2.2, 3.12.10.1, 6.1.3, 6.1.4, 6.2.5,
 9.6.1, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2,
 14.1.1.4, 14.1.4, 15.1.4
 Initial Decision
 15.2
 Initial Decision Maker, Definition of
 1.1.8
 Initial Decision Maker, Decisions
 14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
 Initial Decision Maker, Extent of Authority
 14.2.4, 15.1.4.2, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
 Injury or Damage to Person or Property
 10.2.8, 10.4
 Inspections
 3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
 9.9.2, 9.10.1, 12.2.1, 13.4
 Instructions to Bidders
 1.1.1
 Instructions to the Contractor
 3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.4.2
 Instruments of Service, Definition of
 1.1.7
 Insurance
 6.1.1, 7.3.4, 8.2.2, 9.3.2, 9.8.4, 9.9.1, 9.10.2, 10.2.5,
 11
Insurance, Notice of Cancellation or Expiration
11.1.4, 11.2.3
 Insurance, Contractor's Liability
 11.1
 Insurance, Effective Date of
 8.2.2, 14.4.2
 Insurance, Owner's Liability
 11.2
 Insurance, Property
 10.2.5, 11.2, 11.4, 11.5
 Insurance, Stored Materials
 9.3.2

INSURANCE AND BONDS
 11
 Insurance Companies, Consent to Partial Occupancy
 9.9.1
 Insured loss, Adjustment and Settlement of
 11.5
 Intent of the Contract Documents
 1.2.1, 4.2.7, 4.2.12, 4.2.13
 Interest
 13.5
 Interpretation
 1.1.8, 1.2.3, 1.4, 4.1.1, 5.1, 6.1.2, 15.1.1
 Interpretations, Written
 4.2.11, 4.2.12
 Judgment on Final Award
 15.4.2
 Labor and Materials, Equipment
 1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2, 10.2.1,
 10.2.4, 14.2.1.1, 14.2.1.2
 Labor Disputes
 8.3.1
 Laws and Regulations
 1.5, 2.3.2, 3.2.3, 3.2.4, 3.6, 3.7, 3.12.10, 3.13, 9.6.4,
 9.9.1, 10.2.2, 13.1, 13.3.1, 13.4.2, 13.5, 14, 15.2.8,
 15.4
 Liens
 2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
 Limitations, Statutes of
 12.2.5, 15.1.2, 15.4.1.1
 Limitations of Liability
 3.2.2, 3.5, 3.12.10, 3.12.10.1, 3.17, 3.18.1, 4.2.6,
 4.2.7, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 9.6.8, 10.2.5, 10.3.3,
 11.3, 12.2.5, 13.3.1
 Limitations of Time
 2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7,
 5.2, 5.3, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14, 15,
 15.1.2, 15.1.3, 15.1.5
 Materials, Hazardous
 10.2.4, 10.3
 Materials, Labor, Equipment and
 1.1.3, 1.1.6, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
 5.2.1, 6.2.1, 7.3.4, 9.3.2, 9.3.3, 9.5.1.3, 9.10.2,
 10.2.1.2, 10.2.4, 14.2.1.1, 14.2.1.2
 Means, Methods, Techniques, Sequences and
 Procedures of Construction
 3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2
 Mechanic's Lien
 2.1.2, 9.3.1, 9.3.3, 9.6.8, 9.10.2, 9.10.4, 15.2.8
 Mediation
 8.3.1, 15.1.3.2, 15.2.1, 15.2.5, 15.2.6, 15.3, 15.4.1,
 15.4.1.1
 Minor Changes in the Work
 1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1, 7.4
MISCELLANEOUS PROVISIONS
 13

Init.

Modifications, Definition of
 1.1.1
 Modifications to the Contract
 1.1.1, 1.1.2, 2.5, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7, 10.3.2
 Mutual Responsibility
 6.2
 Nonconforming Work, Acceptance of
 9.6.6, 9.9.3, 12.3
 Nonconforming Work, Rejection and Correction of
 2.4, 2.5, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3, 9.10.4, 12.2
 Notice
 1.6, 1.6.1, 1.6.2, 2.1.2, 2.2.2., 2.2.3, 2.2.4, 2.5, 3.2.4, 3.3.1, 3.7.4, 3.7.5, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 7.4, 8.2.2, 9.6.8, 9.7, 9.10.1, 10.2.8, 10.3.2, 11.5, 12.2.2.1, 13.4.1, 13.4.2, 14.1, 14.2.2, 14.4.2, 15.1.3, 15.1.5, 15.1.6, 15.4.1
 Notice of Cancellation or Expiration of Insurance
 11.1.4, 11.2.3
 Notice of Claims
 1.6.2, 2.1.2, 3.7.4, 9.6.8, 10.2.8, 15.1.3, 15.1.5, 15.1.6, 15.2.8, 15.3.2, 15.4.1
 Notice of Testing and Inspections
 13.4.1, 13.4.2
 Observations, Contractor's
 3.2, 3.7.4
 Occupancy
 2.3.1, 9.6.6, 9.8
 Orders, Written
 1.1.1, 2.4, 3.9.2, 7, 8.2.2, 11.5, 12.1, 12.2.2.1, 13.4.2, 14.3.1
 OWNER
 2
 Owner, Definition of
 2.1.1
 Owner, Evidence of Financial Arrangements
 2.2, 13.2.2, 14.1.1.4
 Owner, Information and Services Required of the
 2.1.2, 2.2, 2.3, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2, 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 13.4.1, 13.4.2, 14.1.1.4, 14.1.4, 15.1.4
 Owner's Authority
 1.5, 2.1.1, 2.3.32.4, 2.5, 3.4.2, 3.8.1, 3.12.10, 3.14.2, 4.1.2, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3, 7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.2, 9.5.1, 9.6.4, 9.9.1, 9.10.2, 10.3.2, 11.4, 11.5, 12.2.2, 12.3, 13.2.2, 14.3, 14.4, 15.2.7
 Owner's Insurance
 11.2
 Owner's Relationship with Subcontractors
 1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2
 Owner's Right to Carry Out the Work
 2.5, 14.2.2
 Owner's Right to Clean Up
 6.3
 Owner's Right to Perform Construction and to Award

Separate Contracts
 6.1
 Owner's Right to Stop the Work
 2.4
 Owner's Right to Suspend the Work
 14.3
 Owner's Right to Terminate the Contract
 14.2, 14.4
 Ownership and Use of Drawings, Specifications and Other Instruments of Service
 1.1.1, 1.1.6, 1.1.7, 1.5, 2.3.6, 3.2.2, 3.11, 3.17, 4.2.12, 5.3
 Partial Occupancy or Use
 9.6.6, 9.9
 Patching, Cutting and
 3.14, 6.2.5
 Patents
 3.17
 Payment, Applications for
 4.2.5, 7.3.9, 9.2, 9.3, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1, 14.2.3, 14.2.4, 14.4.3
 Payment, Certificates for
 4.2.5, 4.2.9, 9.3.3, 9.4, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1, 9.10.3, 14.1.1.3, 14.2.4
 Payment, Failure of
 9.5.1.3, 9.7, 9.10.2, 13.5, 14.1.1.3, 14.2.1.2
 Payment, Final
 4.2.1, 4.2.9, 9.10, 12.3, 14.2.4, 14.4.3
 Payment Bond, Performance Bond and
 7.3.4.4, 9.6.7, 9.10.3, 11.1.2
 Payments, Progress
 9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4
 PAYMENTS AND COMPLETION
 9
 Payments to Subcontractors
 5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
 PCB
 10.3.1
 Performance Bond and Payment Bond
 7.3.4.4, 9.6.7, 9.10.3, 11.1.2
 Permits, Fees, Notices and Compliance with Laws
 2.3.1, 3.7, 3.13, 7.3.4.4, 10.2.2
 PERSONS AND PROPERTY, PROTECTION OF
 10
 Polychlorinated Biphenyl
 10.3.1
 Product Data, Definition of
 3.12.2
 Product Data and Samples, Shop Drawings
 3.11, 3.12, 4.2.7
 Progress and Completion
 4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.4
 Progress Payments
 9.3, 9.6, 9.8.5, 9.10.3, 14.2.3, 15.1.4
 Project, Definition of
 1.1.4
 Project Representatives

Init.

4.2.10
 Property Insurance
 10.2.5, 11.2
 Proposal Requirements
 1.1.1
PROTECTION OF PERSONS AND PROPERTY
 10
 Regulations and Laws
 1.5, 2.3.2, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 9.6.4, 9.9.1,
 10.2.2, 13.1, 13.3, 13.4.1, 13.4.2, 13.5, 14, 15.2.8,
 15.4
 Rejection of Work
 4.2.6, 12.2.1
 Releases and Waivers of Liens
 9.3.1, 9.10.2
 Representations
 3.2.1, 3.5, 3.12.6, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.10.1
 Representatives
 2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.10, 13.2.1
 Responsibility for Those Performing the Work
 3.3.2, 3.18, 4.2.2, 4.2.3, 5.3, 6.1.3, 6.2, 6.3, 9.5.1, 10
 Retainage
 9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
 Review of Contract Documents and Field Conditions
 by Contractor
 3.2, 3.12.7, 6.1.3
 Review of Contractor's Submittals by Owner and
 Architect
 3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
 Review of Shop Drawings, Product Data and
 Samples by Contractor
 3.12
 Rights and Remedies
 1.1.2, 2.4, 2.5, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1,
 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.1, 12.2.2,
 12.2.4, 13.3, 14, 15.4
 Royalties, Patents and Copyrights
 3.17
 Rules and Notices for Arbitration
 15.4.1
 Safety of Persons and Property
 10.2, 10.4
 Safety Precautions and Programs
 3.3.1, 4.2.2, 4.2.7, 5.3, 10.1, 10.2, 10.4
 Samples, Definition of
 3.12.3
 Samples, Shop Drawings, Product Data and
 3.11, 3.12, 4.2.7
 Samples at the Site, Documents and
 3.11
 Schedule of Values
 9.2, 9.3.1
 Schedules, Construction
 3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.6.2
 Separate Contracts and Contractors
 1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
 Separate Contractors, Definition of

6.1.1
 Shop Drawings, Definition of
 3.12.1
 Shop Drawings, Product Data and Samples
 3.11, 3.12, 4.2.7
 Site, Use of
 3.13, 6.1.1, 6.2.1
 Site Inspections
 3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.9.2, 9.4.2, 9.10.1, 13.4
 Site Visits, Architect's
 3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.4
 Special Inspections and Testing
 4.2.6, 12.2.1, 13.4
 Specifications, Definition of
 1.1.6
 Specifications
 1.1.1, 1.1.6, 1.2.2, 1.5, 3.12.10, 3.17, 4.2.14
 Statute of Limitations
 15.1.2, 15.4.1.1
 Stopping the Work
 2.2.2, 2.4, 9.7, 10.3, 14.1
 Stored Materials
 6.2.1, 9.3.2, 10.2.1.2, 10.2.4
 Subcontractor, Definition of
 5.1.1
SUBCONTRACTORS
 5
 Subcontractors, Work by
 1.2.2, 3.3.2, 3.12.1, 3.18, 4.2.3, 5.2.3, 5.3, 5.4,
 9.3.1.2, 9.6.7
 Subcontractual Relations
 5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1
 Submittals
 3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.4, 9.2, 9.3,
 9.8, 9.9.1, 9.10.2, 9.10.3
 Submittal Schedule
 3.10.2, 3.12.5, 4.2.7
 Subrogation, Waivers of
 6.1.1, 11.3
 Substances, Hazardous
 10.3
 Substantial Completion
 4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3,
 12.2, 15.1.2
 Substantial Completion, Definition of
 9.8.1
 Substitution of Subcontractors
 5.2.3, 5.2.4
 Substitution of Architect
 2.3.3
 Substitutions of Materials
 3.4.2, 3.5, 7.3.8
 Sub-subcontractor, Definition of
 5.1.2
 Subsurface Conditions
 3.7.4
 Successors and Assigns

13.2
 Superintendent
 3.9, 10.2.6
 Supervision and Construction Procedures
 1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4,
 7.1.3, 7.3.4, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.4
 Suppliers
 1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.5.4, 9.6,
 9.10.5, 14.2.1
 Surety
 5.4.1.2, 9.6.8, 9.8.5, 9.10.2, 9.10.3, 11.1.2, 14.2.2,
 15.2.7
 Surety, Consent of
 9.8.5, 9.10.2, 9.10.3
 Surveys
 1.1.7, 2.3.4
 Suspension by the Owner for Convenience
 14.3
 Suspension of the Work
 3.7.5, 5.4.2, 14.3
 Suspension or Termination of the Contract
 5.4.1.1, 14
 Taxes
 3.6, 3.8.2.1, 7.3.4.4
 Termination by the Contractor
 14.1, 15.1.7
 Termination by the Owner for Cause
 5.4.1.1, 14.2, 15.1.7
 Termination by the Owner for Convenience
 14.4
 Termination of the Architect
 2.3.3
 Termination of the Contractor Employment
 14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT
 14
 Tests and Inspections
 3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
 9.9.2, 9.10.1, 10.3.2, 12.2.1, 13.4
TIME
 8
 Time, Delays and Extensions of
 3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7,
 10.3.2, 10.4, 14.3.2, 15.1.6, 15.2.5
 Time Limits

2.1.2, 2.2, 2.5, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2,
 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 12.2, 13.4, 14,
 15.1.2, 15.1.3, 15.4
 Time Limits on Claims
 3.7.4, 10.2.8, 15.1.2, 15.1.3
 Title to Work
 9.3.2, 9.3.3
UNCOVERING AND CORRECTION OF WORK
 12
 Uncovering of Work
 12.1
 Unforeseen Conditions, Concealed or Unknown
 3.7.4, 8.3.1, 10.3
 Unit Prices
 7.3.3.2, 9.1.2
 Use of Documents
 1.1.1, 1.5, 2.3.6, 3.12.6, 5.3
 Use of Site
 3.13, 6.1.1, 6.2.1
 Values, Schedule of
 9.2, 9.3.1
 Waiver of Claims by the Architect
 13.3.2
 Waiver of Claims by the Contractor
 9.10.5, 13.3.2, 15.1.7
 Waiver of Claims by the Owner
 9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.3.2, 14.2.4, 15.1.7
 Waiver of Consequential Damages
 14.2.4, 15.1.7
 Waiver of Liens
 9.3, 9.10.2, 9.10.4
 Waivers of Subrogation
 6.1.1, 11.3
 Warranty
 3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.2, 9.10.4, 12.2.2,
 15.1.2
 Weather Delays
 8.3, 15.1.6.2
 Work, Definition of
 1.1.3
 Written Consent
 1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.10.3,
 13.2, 13.3.2, 15.4.4.2
 Written Interpretations
 4.2.11, 4.2.12
 Written Orders
 1.1.1, 2.4, 3.9, 7, 8.2.2, 12.1, 12.2, 13.4.2, 14.3.1

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 or proposal 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. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 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.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 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 retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and 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 the 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 suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, 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 suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

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 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, 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 in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 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,

Init.

assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 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.

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

§ 2.3.4 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.

§ 2.3.5 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.

§ 2.3.6 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 1.5.2.

§ 2.4 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.

§ 2.5 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 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 default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for 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. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

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 its 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 2.3.4, 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 submit 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, subject to Section 15.1.7, 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. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be 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 notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative 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 facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

Init.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 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

§ 3.5.1 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.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 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 14 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 that an equitable adjustment be made 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, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim 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 notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice 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 and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably 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, or fails to provide submittals in accordance with the approved 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 make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and 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 how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. 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 the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect 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 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.

§ 3.12.10.1 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 be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately 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 and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and 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.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 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, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber 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, or patching shall be restored to the condition existing prior to the cutting, fitting, or 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 construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its 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 and 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 the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with 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 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 an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the 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 that 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 Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 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.

§ 4.2 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, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 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 promptly report to the Owner (1) known deviations from the

Init.

Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) 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

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 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 13.4.2 and 13.4.3, whether or not the 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, 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 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 order 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 Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either 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

Init.

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 the subcontractors 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, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice 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 and timely 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 responsively in submitting names as required.

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

§ 5.3 Subcontractual Relations

By appropriate written agreement, 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 that the Contractor, by these Contract 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,

Init.

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; 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 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 term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 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 any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its 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 or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has 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,

Init.

promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 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 that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor 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. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 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
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine 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 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .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, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 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.

§ 7.3.7 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.

§ 7.3.8 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 may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will

Init.

affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

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, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 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 (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended 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

§ 9.1.1 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.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

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

Init.

unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent 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. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and 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 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, suppliers, or other persons or entities that 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 (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole 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 in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. 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. 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 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;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers 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 either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

§ 9.5.4 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 supplier 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 Contractor shall reflect such payment on its next Application 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 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 and suppliers 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 or supplier, except as may otherwise be required by law.

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

Init.

§ 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 or provided by 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, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 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' 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; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and 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 the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the 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 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 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. 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 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, (3) a written statement that the Contractor knows of no 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, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and 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, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance 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 the lien, claim, security interest, or encumbrance, 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, corrected, 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 the 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.

Init.

§ 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;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a 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, a Subcontractor, or a Sub-subcontractor; 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 implement, 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 the owners and users of adjacent sites and utilities of the safeguards.

§ 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. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is 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, notice of the 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 and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. 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 notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's 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 the material or substance or who are to perform the task of removal or safe containment of the 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 by the amount of the Contractor's reasonable additional costs of shutdown, 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 hazardous 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 hazardous 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 reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances 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 reimburse 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 Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 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.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

Init.

§ 11.3 Waivers of Subrogation

§ 11.3.1 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; (2) the Architect and Architect's consultants; and (3) Separate Contractors, 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 those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 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, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement 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 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

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, the Contractor shall be entitled to an equitable adjustment to

the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before 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 any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of 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 2.5.

§ 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 of the Owner or Separate Contractors, whether completed or partially completed, 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, excluding that jurisdiction's choice of law rules. 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 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 the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 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.

§ 13.3.2 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 of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 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 tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 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 13.4.1, 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 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 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.

§ 13.4.4 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.

§ 13.4.5 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.

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

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties 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.

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, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, 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;
- .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 reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, 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 scheduled 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' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work 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' 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 or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .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 reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner 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' 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 thereon 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,

Init.

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 under 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 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 Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

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, a change in the Contract Time, 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. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the 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 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by 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 under this Section 15.1.3.1 shall 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.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 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.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 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.

§ 15.1.6.2 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.

§ 15.1.7 Waiver of 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 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, 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. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a 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 the 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 receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, 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 15.1.7, 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 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 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. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. 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 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party 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 those of the Owner and Contractor under this Agreement.

SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS**PART 1 GENERAL****1.01 SUMMARY**

- A. These Supplementary Conditions amend and supplement the General Conditions defined in Document 00 72 00 - General Conditions and other provisions of the Contract Documents as indicated below. 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 9 - Payments and Completion: Add Paragraph 9.6.1.1: Five percent (5%) of each payment shall be retained, not to exceed 5% of the total Contract Sum, unless specific provisions to the contrary are indicated in the Contract.
- B. Article 11 - Insurance and Bonds: Add Paragraph 11.1.1.1: The minimum policy limits of such insurance shall be as follows:
 - 1. Workmen's Compensation: Statutory
 - 2. Employer's Liability: \$1,000,000
 - 3. Comprehensive General Liability:
 - a. \$1,000,000 - per occurrence.
 - b. \$2,000,000 - General Aggregate.
 - 4. Comprehensive Motor Vehicle Liability Insurance:
 - a. \$1,000,000 - combined single limit.
 - 5. Umbrella / Excess Liability
 - a. \$3,000,000.
- C. Add Paragraph 11.2.1.1: 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.
- D. Article 13 - Miscellaneous Provisions: Add Paragraph 13.6: Should any uncharted underground obstructions be encountered that would cause a change in location of utility lines or building lines from that shown on the Drawings, the Contractor shall notify the Architect and obtain approval prior to proceeding with the Work. Any resultant change in the Contract Sum will be processed by Change Order.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION - NOT USED****END OF SECTION**

SECTION 011000**SUMMARY****PART 1 GENERAL****1.01 PROJECT**

- A. Project Name: Elementary School Restroom / Locker Room Remodel - Phase 2.
- B. Owner's Name: Central Lyon Community School District.
- C. Architect's Name: CMBA Architects.
- D. Additional Project contact information is specified in Section 000103 - Project Directory.
- E. The Project consists of:
 - 1. The remodel of two (2) existing multi-user restrooms on the first floor, with demolition of an existing custodial closet and addition of a single-user restroom.
 - 2. The remodel of two (2) existing multi-user restrooms and custodial room on the second floor.
 - 3. The remodel of two (2) existing locker rooms on the second floor, including conversion of an existing shower area to a cooler niche for the kitchen.

1.02 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 005200 - Agreement Form.

1.03 DESCRIPTION OF WORK

- A. Scope of demolition and removal work is shown on drawings and specified in Section 024100.
- B. Scope of alterations and new construction work is shown on drawings.
- C. Services (Including but not limited to Plumbing, HVAC, Electrical Power and Lighting, Fire Protection, Telecommunications, and Security): Alter existing system and add new construction, keeping existing in operation.
- D. Owner will remove the following items before start of work:
 - 1. Furnishings.
 - 2. Artwork.
 - 3. Portable equipment.
- E. Contractor shall remove and store the following prior to start of work, for later reinstallation by Contractor:
 - 1. Signage
 - 2. Lockers as indicated.
 - 3. Fire Extinguishers and Cabinets as indicated

1.04 WORK BY OWNER

- A. Owner will supply and install the following:
 - 1. Wall Paint (painting of lintels still CFCI).
- B. Owner will supply the following for installation by Contractor (OFCI):
 - 1. Toilet Accessories as identified in Section 102800.
 - 2. Portions of existing lockers in Locker Rooms.

1.05 OWNER-FURNISHED ITEMS

- A. The Work includes providing support systems to receive Owner's equipment, and mechanical and electrical connections.
- B. The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor's Construction Schedule, and will inspect deliveries for damage.
- C. If Owner-furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Owner will also arrange for manufacturer's field services, and the delivery of manufacturer's warranties and bonds to the Contractor.

- D. The Contractor is responsible for designating the delivery dates of Owner furnished items in the Contractor's Construction Schedule and for receiving, unloading and handling Owner-furnished items at the site.
- E. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of his operations.

1.06 OWNER OCCUPANCY

- A. Owner intends to continue to occupy adjacent portions of the existing building during the entire construction period.
- B. Owner intends to occupy the Project area upon Substantial Completion.
- C. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
- D. Schedule the Work to accommodate Owner occupancy.

1.07 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas noted on Drawings.
 - 1. Locate and conduct construction activities in ways that will limit disturbance to site.
- B. Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project. Sub-contractors working on different Bid Packages will be on the site at the same time. The General Contractor will coordinate all work between all Sub-contractors.
- C. Arrange use of site and premises to allow:
 - 1. Owner occupancy.
 - 2. Work by Others.
 - 3. Use of site and premises by the public.
- D. 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.
 - 3. Alternative entrances, exits and Interim life safety procedures will be required if the main entrance or any fire exits are closed during construction. Coordinate durations with Owner.
 - 4. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
- E. Time Restrictions:
 - 1. After school is in session, limit conduct of especially noisy, malodorous, and dusty work to the hours of 3:30 pm to 8 am..
- F. Utility Outages and Shutdown:
 - 1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
 - 2. Prevent accidental disruption of utility services to facilities.

1.08 WORK SEQUENCE

- A. Coordinate work of the various Sections of Specifications to assure efficient and orderly sequence of installation of construction elements, with provisions for accommodating items installed later.
- B. Verify characteristics of elements of interrelated operating equipment are compatible; coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

- C. Coordinate space requirements and installation of mechanical and electrical work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduits, as closely as practicable; make runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Execute cutting and patching to integrate elements of Work, uncover ill-timed, defective, and non-conforming Work, provide openings for penetrations of existing surfaces, and provide samples for testing if required. Seal penetrations through floors, walls, and roof.

1.09 WORK RESTRICTIONS

- A. Controlled Substances: Use of tobacco products and other controlled substances on Project site is not permitted.

1.10 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The specifications use certain conventions for the style of language and intended meaning of certain terms, word, and phrases when used in particular situations. These conventions are as follows:
 - 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall be", or "shall comply with", depending on the context, are implied where a colon(:) is used within a sentence or phrase.
 - 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specification Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.

1.11 MISCELLANEOUS PROVISIONS

- A. Contractor's One-Year Correction Period: For a period of one (1) year commencing upon the Date of Substantial Completion of the Work, Prime General Contractor shall repair or replace defective work and / or material to conform to the provisions of the Contract Documents without expense to the Owner, and within ten (10) working days after notification in writing by the Owner of such defective work or material.
 - 1. If Prime General Contractor shall not have made such repairs or replacements or have made arrangements for the correction thereof within the period specified above, the Owner shall do so and shall charge the cost to the Prime General Contractor.
 - 2. See individual Specification Sections of the Project Manual regarding warranty-guarantee periods for various items of a longer period of time.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 012000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

- A. Section 007200 - General Conditions and Document 007300 - Supplementary Conditions: Additional requirements for progress payments, final payment, changes in the Work.
- B. Section 012100 - Allowances: Payment procedures relating to allowances.
- C. Section 017800 - Closeout Submittals: Project record documents.

1.03 SCHEDULE OF VALUES

- A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.
- B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification Section. Identify site mobilization and bonds and insurance.
- F. Include in each line item, the amount of Allowances specified in this section.
- G. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Payment Period: Submit at intervals stipulated in the Agreement.
- B. Use Form AIA G702 and Form AIA G703, edition stipulated in the Agreement.
- C. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.
- D. Forms filled out by hand will not be accepted.
- E. For each item, provide a column for listing each of the following:
 - 1. Item Number.
 - 2. Description of work.
 - 3. Scheduled Values.
 - 4. Previous Applications.
 - 5. Work in Place and Stored Materials under this Application.
 - 6. Authorized Change Orders.
 - 7. Total Completed and Stored to Date of Application.
 - 8. Percentage of Completion.
 - 9. Balance to Finish.
 - 10. Retainage.
- F. Execute certification by signature of authorized officer.
- G. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- H. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.

- I. Submit one electronic and three hard-copies of each Application for Payment.
- J. When Architect requires substantiating information, submit data justifying dollar amounts in question.

1.05 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
- B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
 - 1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 - 2. Promptly execute the change.
- C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 10 days.
- D. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation. Document any requested substitutions in accordance with Section 016000.
- E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
 - 1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
 - 2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
 - 3. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- F. Substantiation of Costs: Provide full information required for evaluation.
 - 1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 - 2. Support each claim for additional costs with additional information:
 - a. Origin and date of claim.
 - b. Dates and times work was performed, and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 - 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- G. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
- H. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- I. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

J. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

1. All closeout procedures specified in Section 017000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 012100
ALLOWANCES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Contingency allowance.
- B. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

- A. Section 012000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CONTINGENCY ALLOWANCE

- A. Contractor's costs for products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit will be included in Change Orders authorizing expenditure of funds from this Contingency Allowance.
- B. Funds will be drawn from the Contingency Allowance only by Change Order.
- C. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.04 ALLOWANCES SCHEDULE

- A. **CONTINGENCY ALLOWANCE:** Include the stipulated sum of **\$69,264.00** for use upon Owner's instructions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

**SECTION 012300
ALTERNATES**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of Alternates.
- B. Procedures for pricing Alternates.
- C. Documentation of changes to Contract Sum and Contract Time.

1.02 RELATED REQUIREMENTS

- A. Document 002113 - Instructions to Bidders: Instructions for preparation of pricing for Alternates.

1.03 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.04 SCHEDULE OF ALTERNATES

- A. Alternate No. ____ - _____:
 - 1. Base Bid Item: Section _____ and Drawing number ____ including _____.
 - 2. Alternate Item: Section _____ and Drawing number ____ including _____.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 013000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. General administrative requirements.
- B. Electronic document submittal service.
- C. Preconstruction meeting.
- D. Progress meetings.
- E. Submittals for review, information, and project closeout.
- F. Number of copies of submittals.
- G. Requests for Interpretation (RFI) procedures.
- H. Submittal procedures.

1.02 RELATED REQUIREMENTS

- A. Section 007200 - General Conditions: Dates for applications for payment.
- B. Section 013216 - Construction Progress Schedule: Form, content, and administration of schedules.
- C. Section 016000 - Product Requirements: General product requirements.
- D. Section 017000 - Execution and Closeout Requirements: Additional coordination requirements.
- E. Section 017800 - Closeout Submittals: Project record documents; operation and maintenance data; warranties and bonds.

1.03 GENERAL ADMINISTRATIVE REQUIREMENTS

- A. Comply with requirements of Section 017000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

1.04 PROJECT COORDINATOR

- A. Project Coordinator: General Contractor.
- B. Cooperate with the Project Coordinator in allocation of mobilization areas of site; for field offices and sheds, for site and existing building access, traffic, and parking facilities.
- C. During construction, coordinate use of site and facilities through the Project Coordinator.
- D. Comply with Project Coordinator's procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- E. Comply with instructions of the Project Coordinator for use of temporary utilities and construction facilities. Responsibility for providing temporary utilities and construction facilities is identified in Section 011000 - Summary.
- F. Coordinate field engineering and layout work under instructions of the Project Coordinator.
- G. Make the following types of submittals to Architect through the Project Coordinator:
 - 1. Requests for Interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Correction Punch List and Final Correction Punch List for Substantial Completion.
 - 10. Closeout submittals.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE**

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via Internet-based submittal service.
 - 1. The web-based software will provide status logs, reports, searching and automated notifications.
 - 2. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 3. Contractor and Architect are required to use this service.
 - 4. It is Contractor's responsibility to submit documents in allowable format.
 - 5. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
 - 6. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
 - 7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts, which shall be delivered by mail or courier.
- B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.
- C. Submittal Service (if used): The selected service is:
 - 1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com/#sle.
- D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.
- E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

- A. Project Coordinator will schedule a meeting after Notice of Award.
- B. Attendance Required:
 - 1. Owner.
 - 2. Architect.
 - 3. Contractor.
 - 4. Major subcontractors.
 - 5. Architect's consultants.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
 - 3. Designation of personnel representing the parties to Contract, the Owner's Representative and Architect.
 - 4. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 5. Scheduling.

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

3.03 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.
- B. Project Coordinator will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect, at frequency per Owner-Architect agreement.
 - 4. Contractor's superintendent.
 - 5. Major subcontractors.
 - 6. Major Suppliers.
 - 7. Additional consultants, subcontractors, suppliers and product representatives as appropriate to agenda topics for each meeting.
- D. Agenda:
 - 1. Review minutes of previous meetings.
 - 2. Review of work progress.
 - 3. Field observations, problems, and decisions.
 - 4. Identification of problems that impede, or will impede, planned progress.
 - 5. Review of submittals schedule and status of submittals.
 - 6. Review of off-site fabrication and delivery schedules.
 - 7. Maintenance of progress schedule.
 - 8. Corrective measures to regain projected schedules.
 - 9. Planned progress during succeeding work period.
 - 10. Coordination of projected progress.
 - 11. Maintenance of quality and work standards.
 - 12. Effect of proposed changes on progress schedule and coordination.
 - 13. Other business relating to work.
- E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE - SEE SECTION 013216

3.05 REQUESTS FOR INTERPRETATION (RFI)

- A. Definition: A request seeking one of the following:
 - 1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
 - 2. A resolution to an issue which has arisen due to field conditions and affects design intent.
- B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.
- C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
 - 1. Prepare a separate RFI for each specific item.
 - a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
 - b. Do not forward requests which solely require internal coordination between subcontractors.

2. Prepare using software provided by the Electronic Document Submittal Service (if used).
 3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.
- D. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.
 2. Unacceptable Uses for RFIs: Do not use RFIs to request the following:
 - a. Approval of submittals (use procedures specified elsewhere in this section).
 - b. Approval of substitutions (see Section - 016000 - Product Requirements)
 - c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
 - d. Different methods of performing work than those indicated in the Contract Drawings and Specifications (comply with provisions of the Conditions of the Contract).
 3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
 4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
- E. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
 2. Owner's, Architect's, and Contractor's names.
 3. Discrete and consecutive RFI number, and descriptive subject/title.
 4. Issue date, and requested reply date.
 5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
 6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
 7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.
- F. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.
- G. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
 2. Note dates of when each request is made, and when a response is received.
 3. Highlight items requiring priority or expedited response.
 4. Highlight items for which a timely response has not been received to date.
- H. Review Time: Architect will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.
- I. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.

1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.
3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.06 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.
 5. Other types indicated.
- B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in 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 017800 - Closeout Submittals.

3.07 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.

3.08 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 017800 - Closeout Submittals:
 1. Project record documents.
 2. Operation and maintenance data.
 3. Warranties.
 4. Other types as indicated.
- D. Submit for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

- A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
 1. Transmit to Architect/ Engineer via Electronic Document Submittal Service.
- B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
 1. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

- A. General Requirements:
 - 1. Use a single transmittal for related items.
 - 2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
 - 3. Transmit using approved form.
 - a. Use Contractor's form, subject to prior approval by Architect.
 - 1) Or use form generated by Electronic Document Submittal Service software.
 - 4. Sequentially identify each item. For revised submittals use original number and a sequential alphabetical suffix.
 - 5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
 - 6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
 - a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
 - 7. Schedule submittals to expedite the Project, and coordinate submission of related items.
 - a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
 - b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
 - c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 days.
 - 8. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
 - 9. Provide space for Contractor and Architect review stamps.
 - 10. When revised for resubmission, identify all changes made since previous submission.
 - 11. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
 - 12. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
 - 13. Submittals not requested will be recognized, and will be returned "Not Reviewed",
- B. Product Data Procedures:
 - 1. Submit only information required by individual specification sections.
 - 2. Collect required information into a single submittal.
 - 3. Submit concurrently with related shop drawing submittal.
 - 4. Do not submit (Material) Safety Data Sheets for materials or products.
- C. Shop Drawing Procedures:
 - 1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
 - 2. Do not reproduce Contract Documents to create shop drawings.
 - 3. Use of reproductions of Contract Documents in digital data form to create shop drawings is only permitted as defined in the "Third Party User Agreement", immediately following this section.
 - 4. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.
- D. Samples Procedures:
 - 1. Transmit related items together as single package.
 - 2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3. Include with transmittal high-resolution image files of samples to facilitate electronic review and approval. Provide separate submittal page for each item image.
- E. Submittals shall be numbered by Specification section and sequence: ie 23 5243 - 1, 23 5243-2. Revise submittals with original number and a sequential alphabetic suffix.

3.11 SUBMITTAL REVIEW

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

END OF SECTION

THIRD PARTY USER AGREEMENT FOR ELECTRONIC DATA

This agreement sets forth terms and conditions for use of digital and electronic data provided by CMBA Architects P.C. herein referred to as "Architect", by a Third Party User, herein referred to as "User". Architect retains ownership of digital and electronic data and permission to use Architect's digital and electronic data is given only subject to the terms and conditions of this Agreement.

Article A:

The digital and electronic data is provided solely for the User's work on the specific project or phase specified below. No permission is implied nor given herein for reuse, copying or use on another project, for use on additions to this Project or for completion of this Project by another design professional. Exceptions may be granted by a written agreement outlining compensation and legal protection to be provided to Architect. Without written verification or adaptation by Architect, use of modified files by the User will be at the User's risk and full legal responsibility. Architect shall be compensated for verification or adaptation.

Article B:

The digital and electronic data represents only a portion of the professional architectural services performed by the Architect. No representation is made by Architect that the data includes all changes made to the digital files, archived files, or other documents since their initial release for bidding. Architect does not warrant nor make claim to the fact that these documents are without inaccuracies or that they are complete. User agrees to defend and hold harmless Architect in the event of any action against or by User for the preparation of information generated through the use of Architect's digital or electronic data. In the event of such legal action, User agrees to pay reasonable fees for legal counsel and expenses incurred by the Architect.

Article C:

The digital and electronic data are used by the Architect as an internal tool for representation of the intended design and means of construction and therefore may be incomplete, inaccurate, or out of date. Architect makes no representation as to the completeness, currency, nor accuracy of the information provided to User. User takes full responsibility for the accuracy and correctness of all areas, measurements or other information extracted from this data. Additionally, Architect does not represent that information will remain intact, accurate, complete, or legible if translated from the software and/or hardware system used by Architect.

Article D:

Utilization of digital or electronic data not in accordance with the terms and conditions of this Agreement shall constitute a breach of this Agreement and the Architect will at such time demand return of it's property and may seek legal recourse and the cost of reasonable fees. Any other use of drawings or electronic data obtained without authorization from CMBA is prohibited.

Article E:

If this request is for a current project of which CMBA is the architect, compensation in the amount of \$250.00 shall be paid to the Architect at the time of execution of this Agreement. Special requests to delete or add information, as well as excessive coordination time due to software compatibility or other issue, may incur additional expense. Architect may not be able to accommodate all special requests. Compensation shall be billed at the rate of \$70.00 per hour plus expenses.

If this is a request for an archived project or a new project which CMBA will not serve as the architect of record, compensation will be determined by CMBA as appropriate to the request. Minimum costs will be \$100/per drawing sheet. Acceptance of these terms by User communicated by their signature below, constitutes a waiver of liability and the acceptance of responsibilities for the coordination of any revisions made to the information transmitted. Requested data will be provided upon receipt by Architect of this Agreement and payment.

Name of Project: _____

Name of User: _____

Above Terms and Conditions Accepted By: _____

Date: _____

SECTION 013216
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Preliminary schedule.
- B. Construction progress schedule, bar chart type.

1.02 REFERENCE STANDARDS

- A. AGC (CPSM) - Construction Planning and Scheduling Manual.

1.03 SUBMITTALS

- A. Within 10 days after date of Agreement, submit preliminary schedule.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.
- F. Submit under transmittal letter form specified in Section 013000 - Administrative Requirements.

1.04 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.
- B. Diagram Sheet Size: Maximum 11 x 17 inches.
- C. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 PRELIMINARY SCHEDULE**

- A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate floors and other logically grouped activities.
- D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- E. Indicate delivery dates for owner-furnished products.
- F. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.

3.06 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 014000
QUALITY REQUIREMENTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Submittals.
- B. References and standards.
- C. Testing and inspection agencies and services.
- D. Control of installation.
- E. Mock-ups.
- F. Tolerances.
- G. Defect Assessment.

1.02 RELATED REQUIREMENTS

- A. Document 007200 - General Conditions: Inspections and approvals required by public authorities.
- B. Section 013000 - Administrative Requirements: Submittal procedures.
- C. Section 014533 - Code-Required Special Inspections and Testing
- D. Section 016000 - Product Requirements: Requirements for material and product quality.

1.03 SUBMITTALS

- A. See Section 013000 - 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.
 - 2. Test report submittals are 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.
- D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the

Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.04 REFERENCES AND STANDARDS

- A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.
- C. Obtain copies of standards where required by product specification sections.
- D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.
- E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.05 TESTING AND INSPECTION AGENCIES AND SERVICES

- A. Owner will employ and pay for services of an independent testing agency to perform specified testing and inspection.
- B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- C. See Section 014533 - Code-Required Special Inspections and Testing for additional information.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.
- B. Comply with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

- A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.
- B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

- C. Notify Architect and Architect's Consultant fifteen (15) working days in advance of dates and times when mock-ups will be constructed.
- D. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.
- E. Accepted mock-ups shall be a comparison standard for the remaining Work.
- F. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

3.03 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

- A. See individual specification sections for testing and inspection required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - 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.
- C. Limits on Testing/Inspection Agency Authority:
 - 1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Agency may not approve or accept any portion of the Work.
 - 3. Agency may not assume any duties of Contractor.
 - 4. Agency has no authority to stop the Work.
- D. Contractor Responsibilities:
 - 1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
 - 2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
 - 3. Provide incidental labor and facilities:
 - a. To provide access to Work to be tested/inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
 - c. To facilitate tests/inspections.
 - d. To provide storage and curing of test samples.
 - 4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
 - 5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
 - 6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
- E. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

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

3.05 DEFECT ASSESSMENT

- A. Replace Work or portions of the Work not complying with specified requirements.
- B. If, in the opinion of Architect, it is not practical to remove and replace the work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 014533**CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Code-required special inspections.
- B. Testing services incidental to special inspections.
- C. Submittals.

1.02 RELATED REQUIREMENTS

- A. Section 013000 - Administrative Requirements: Submittal procedures.
- B. Section 014000 - Quality Requirements.
- C. Section 016000 - Product Requirements: Requirements for material and product quality.

1.03 DEFINITIONS

- A. Code or Building Code: ICC (IBC)-2015, Edition of the International Building Code and specifically, Chapter 17 - Special Inspections and Tests.
- B. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
- C. Special Inspection:
 - 1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
 - 2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.04 REFERENCE STANDARDS

- A. ICC (IBC)-2015 - International Building Code.
- B. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
 - 1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
 - 2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - 3. Submit certification that Special Inspection Agency is acceptable to AHJ.
- C. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of Special Inspector.
 - d. Date and time of special inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of special inspection.
 - h. Date of special inspection.

- i. Results of special inspection.
 - j. Compliance with Contract Documents.
 2. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
 - D. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
 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 or inspection.
 - h. Date of test or inspection.
 - i. Results of test or inspection.
 - j. Compliance with Contract Documents.
 - E. Certificates: When specified in individual special inspection requirements, Special Inspector shall submit certification by the manufacturer, fabricator, and installation subcontractor to Architect and AHJ, in quantities specified for Product Data.
 1. Indicate material or product complies with or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.06 SPECIAL INSPECTION AGENCY

1.07 TESTING AND INSPECTION AGENCIES

- A. Owner will employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.
- B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

- A. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
 1. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
 2. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

3.02 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

- A. Masonry Structures Subject to Special Inspection:
 1. Masonry construction when required by the quality assurance program of TMS 402/602.
 2. Engineered masonry in structures classified as "low hazard..." and "substantial hazard to human life in the event of failure".
- B. Verify each item below complies with approved Contract Documents and the applicable articles of TMS 402/602.
 1. Inspections and Approvals:
 - a. Verify compliance with the required inspection provisions of the approved Contract Documents; periodic.
 - b. Verify approval of submittals required by Contract Documents; periodic.
 2. Compressive Strength of Masonry: Verify compressive strength of masonry units prior to start of construction unless specifically exempted by code; periodic.

3. Slump Flow and Visual Stability Index (VSI): Verify compliance as self consolidating grout arrives on site; continuous.
4. Joints and Accessories: When masonry construction begins, verify:
 - a. Proportions of site prepared mortar; periodic.
 - b. Construction of mortar joints; periodic.
 - c. Location of reinforcement, connectors, prestressing tendons, anchorages, etc; periodic.
5. Structural Elements, Joints, Anchors, Protection: During masonry construction, verify:
 - a. Size and location of structural elements; periodic.
 - b. Type, size and location of anchors, including anchorage of masonry to structural members, frames or other construction; periodic.
 - c. Size, grade and type of reinforcement, anchor bolts and prestressing tendons and anchorages; periodic.
 - d. Welding of reinforcing bars; continuous.
6. Grouting Preparation: Prior to grouting, verify:
 - a. Grout space is clean; periodic.
 - b. Correct placement of reinforcing, connectors, prestressing tendons and anchorages; periodic.
 - c. Correctly proportioned site prepared grouts and prestressing grout for bonded tendons; periodic.
 - d. Correctly constructed mortar joints; periodic.
7. Preparation of Grout Specimens, Mortar Specimens and Prisms: Observe preparation of specimens; periodic.

3.03 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

- A. Special Inspection Agency shall:
 1. Verify samples submitted by Contractor comply with the referenced standards and the approved Contract Documents.
 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified reference standards.
 4. Ascertain compliance of materials and products with requirements of Contract Documents.
 5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
 6. Perform additional tests and inspections required by Architect.
 7. Submit reports of all tests or inspections specified.
- B. Limits on Special 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. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- D. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.04 TESTING AGENCY DUTIES AND RESPONSIBILITIES

- A. Testing Agency Duties:
 1. Test samples submitted by Contractor.
 2. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 3. Perform specified sampling and testing of products in accordance with specified standards.

4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 5. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
 6. Perform additional tests and inspections required by Architect.
 7. Submit reports of all tests or inspections specified.
- B. Limits on Testing or 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. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.
- D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.05 CONTRACTOR DUTIES AND RESPONSIBILITIES

- A. Contractor Responsibilities, General:
1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
 2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
 3. Provide incidental labor and facilities:
 - a. To provide access to work to be tested or inspected.
 - b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
 - c. To facilitate tests or 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 or inspection services.
 5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

END OF SECTION

SECTION 015000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Temporary utilities: Electricity, lighting, heat, ventilation.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers and enclosures.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Project identification sign.
- I. Field offices.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

1.03 GENERAL

- A. Install temporary facilities and utilities in conformance with State and Local Codes and requirements.
- B. Trade Contractors to obtain and pay for required applications, permits and inspections.
- C. Early Service: Any Contractor requiring temporary service before it can be provided as specified, or whose requirements with respect to a particular service differ from the service specified shall provide such service as suits his needs, at his own expense, and in a manner satisfactory to the General Contractor.
- D. Maintenance: Temporary facilities and utilities are to be maintained and kept in good operating condition. Maintenance men necessary to perform this work shall be provided in accordance with requirements. Maintenance time will include normal working hours for all trades and start up and shut down overtime as required.
- E. Removals: Subject to approval of General Contractor, contractor providing temporary facilities or services shall remove same when no longer required or when their function is replaced by authorized use of permanent facilities. Other removal time may be directed by General Contractor.
- F. Install temporary work in such a manner as not to interfere with the permanent construction.
- G. Disclaimer: Specific administrative and procedural minimum actions are specified in this section, as extension of provisions in General Conditions and other contract documents. These requirements have been included for special purposes as indicated. Nothing in this section is intended to limit types and amounts of temporary work required, and no omission from this section will be recognized as an indication by Architect, Engineer or General Contractor that such temporary activity is not required for successful completion of the work and compliance with requirements of contract documents. Provisions of this section are applicable to, but not by way of limitation, utility services, construction facilities, security/protection provisions, and support facilities.
- H. Use of permanent systems and facilities:
 - 1. Obtain written agreement with Owner, establishing start of warranties and conditions of use:
 - a. Systems complete, with utility connections and safety devices.
 - b. Automatic controls operational.

- c. Temporary filters and items required for protection of equipment and finishes are in place.
- d. Replace items damaged during temporary service use.

1.04 TEMPORARY UTILITIES

- A. Owner will provide the following:
 - 1. Electrical power and metering, consisting of connection to existing facilities.
 - 2. Water supply, consisting of connection to existing facilities.

1.05 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
- B. Telecommunications services shall include:
 - 1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
 - 2. Internet Connections: Minimum of one; DSL modem or faster.

1.06 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
- B. New permanent facilities may not be used during construction operations.
- C. Maintain daily in clean and sanitary condition.

1.07 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 .
- B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.08 INTERIOR ENCLOSURES

- A. Provide temporary partitions 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 gypsum board sheet materials with closed joints and sealed edges at intersections with existing surfaces:
 - 1. Maximum flame spread rating of 25 in accordance with ASTM E84.
- C. Provide all shoring and bracing required for safety and proper execution of the work. Remove the items when the work is completed.
- D. Paint surfaces exposed to view from Owner-occupied areas.

1.09 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.
- B. Coordinate with Owner's security program.

1.10 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities and Owner.
- C. Provide traffic control at critical areas of haul routes to regulate traffic, to minimize interference with public traffic.
- D. Provide and maintain access to fire hydrants, free of obstructions. Leave fire lanes and aisles to fire fighting equipment unobstructed at all times. Do not pile material in front of fire equipment, fire doors, or hydrants.
- E. Provide means of removing mud from vehicle wheels before entering streets.

- F. Designated existing on-site roads may be used for construction traffic.
- G. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.
- H. Existing parking areas may be used for construction parking.
 - 1. Do not obstruct egress to and from parking areas unless authorized by Owner.
- I. Parking of private vehicles of workers shall be in an area allocated by General Contractor and/or Owner.

1.11 WASTE REMOVAL

- A. See Section 017419 - Construction Waste Management and Disposal, for additional requirements.
- B. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition. Locate in area designated by Owner and General Contractor.
- C. Provide containers with lids. Remove trash from site periodically, legally disposing of waste materials, debris and rubbish off site and off Owner's property.
- D. Remove waste materials, debris, and rubbish from building daily.
- E. Carts, trucks, etc. used to transport materials shall be loaded in a safe manner. Materials shall not protrude beyond the sides of conveyance used.
- F. Materials shall not be thrown or dropped from scaffolds or other overhead areas.
- G. Gasoline or other highly flammable liquids shall not be brought inside facilities.

1.12 PROJECT IDENTIFICATION

- A. Provide project identification sign of design and construction indicated on drawings.
- B. Erect on site at location indicated.
- C. No other signs are allowed without Owner permission except those required by law.

1.13 FIELD OFFICES

- A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture and drawing display table.
 - 1. Review proposed location within Project Site with Owner.
 - 2. Provide space for Project meetings, with table and chairs to accommodate 10 persons.
- B. Field Offices shall be maintained until final acceptance and then be removed by the responsible party, no later than fifteen (15) days after acceptance of building, unless the General Contractor orders or approves earlier removal.
- C. Expenses:
 - 1. General Contractor: All expenses in connection with his Field Offices, including the installation costs and use of telephones, heat, air-conditioning, light, water and janitor service shall be paid for by the General Contractor and will be fully reimbursed by the Owner.
 - 2. Trade Contractors: All expenses associated with their offices including utility installation costs shall be included in their bid.
 - 3. Toll Costs: All long distance calls to be paid for by party placing call including Architect, Owner's representative, and contractors.
- D. Each Trade Contractor: To keep a complete set of drawings, and specifications kept marked up to date with revision, Addenda, as-built drawings, and all permits and approved shop drawings on file.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.
- B. Clean and repair damage caused by installation or use of temporary work.

- C. Restore existing facilities used during construction to original condition.
- D. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 016000
PRODUCT REQUIREMENTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. General product requirements.
- B. Transportation, handling, storage and protection.
- C. Product option requirements.
- D. Substitution limitations.
- E. Procedures for Owner-supplied products.
- F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

- A. Section 011000 - Summary: Lists of products to be removed from existing building.
- B. Section 011000 - Summary: Identification of Owner-supplied products.
- C. Section 014000 - Quality Requirements: Product quality monitoring.
- D. Section 016010 - Substitution Procedures: Substitutions made during procurement and/or construction phases.
- E. Section 016010.01 - Substitution Request Form
- F. Section 017419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 SUBMITTALS

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

PART 2 PRODUCTS**2.01 EXISTING PRODUCTS**

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by Contract Documents.
- B. Unforeseen historic items encountered remain the property of the Owner; notify Owner promptly upon discovery; protect, remove, handle, and store as directed by Owner.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to the Owner, or otherwise indicated as to remain the property of the Owner, become the property of the Contractor; remove from site.
- D. Specific Products to be Reused: The reuse of certain materials and equipment already existing on the project site is indicated in the documents.
 - 1. See Section 011000 for list of items required to be salvaged for reuse and relocation.
 - 2. If reuse of other existing materials or equipment is desired, submit substitution request.

2.02 NEW PRODUCTS

- A. Provide new products unless specifically required or permitted by Contract Documents.
- B. Use of products having any of the following characteristics is not permitted:

1. Made using or containing CFC's or HCFC's.
 2. Containing lead, cadmium, or asbestos.
- C. Where other criteria are met, Contractor shall give preference to products that:
1. If used on interior, have lower emissions.
 2. If wet-applied, have lower VOC content.
 3. Are extracted, harvested, and/or manufactured closer to the location of the project.
 4. Result in less construction waste. See Section 017419
 5. If made of wood, are made of sustainably harvested wood, wood chips, or wood fiber.

2.03 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.
- C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

- A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.
- B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

- A. See Section 016010 - Substitution Procedures.

3.02 OWNER-SUPPLIED PRODUCTS

- A. See Section 011000 - Summary for identification of Owner-supplied products.
- B. Owner's Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
 2. Arrange and pay for product delivery to site.
 3. On delivery, inspect products jointly with Contractor.
 4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
 5. Arrange for manufacturers' warranties, inspections, and service.
- C. Contractor's Responsibilities:
1. Review Owner reviewed shop drawings, product data, and samples.
 2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
 3. Protect items until installation.
 4. Handle, store, install and finish products.
 5. Repair or replace items damaged after receipt.

3.03 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.

3.04 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 017419.
- 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. Provide off-site storage and protection when site does not permit on-site storage or protection.
- G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.
- H. Comply with manufacturer's warranty conditions, if any.
- I. Do not store products directly on the ground.
- J. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- K. Prevent contact with material that may cause corrosion, discoloration, or staining.
- L. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- M. 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 016010
SUBSTITUTION PROCEDURES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

- A. Section 002113 - Instructions to Bidders: Restrictions on timing of substitution requests.
- B. Section 013000 - Administrative Requirements: Submittal procedures, coordination.
- C. Section 016000 - Product Requirements: Fundamental product requirements, product options, delivery, storage, and handling.
- D. Section 016010.01 - Substitution Request Form

1.03 DEFINITIONS

- A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
 - 1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
 - a. Unavailability.
 - b. Regulatory changes.
 - 2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
 - a. Substitution requests offering advantages solely to the Contractor will not be considered.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 GENERAL REQUIREMENTS**

- A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
 - 1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
 - 2. Agrees to provide the same warranty for the substitution as for the specified product.
 - 3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
 - 4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
 - 5. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.
- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
 - 1. Note explicitly any non-compliant characteristics.
- C. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
 - 1. Forms included in the Project Manual are adequate for this purpose, and must be used.
- D. Limit each request to a single proposed substitution item.
 - 1. Submit an electronic document, combining the request form with supporting data into single document.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

- A. Section 002113 - Instructions to Bidders specifies time restrictions for submitting requests for substitutions during the bidding period, and the documents required.
- B. Submittal Form (before award of contract):
 - 1. Submit substitution requests by completing the form provided in Section 016011. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

- A. Submittal Form (after award of contract):
 - 1. Submit substitution requests by completing the form provided in Section 016010.01. See this section for additional information and instructions. Use only this form; other forms of submission are unacceptable.
- B. Architect will consider requests for substitutions only within 15 days after date of Agreement.
- C. Substitutions will be considered when a product, through no fault of the Contractor, becomes unavailable or unsuitable due to regulatory change.
 - 1. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.
- D. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- E. Substitutions will not be considered under one or more of the following circumstances:
 - 1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
 - 2. Without a separate written request.
 - 3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

- A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.
- B. Architect will notify Contractor in writing of decision to accept or reject request.
 - 1. Architect's decision following review of proposed substitution will be noted on the submitted form.

3.05 ACCEPTANCE

- A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

- A. See Section 017800 - Closeout Submittals, for closeout submittals.
- B. Include completed Substitution Request Forms as part of the Project record.

END OF SECTION

**SECTION 016010.01
SUBSTITUTION REQUEST FORM**

We hereby submit for your consideration the following product instead of the specified item for the following project:

PROJECT TITLE _____ PROJECT NO. _____

DRAWING NO. _____ DRAWING TITLE _____

SPEC. SECTION	SPEC. TITLE	PARAGRAPH	SPECIFIED ITEM
_____	_____	_____	_____

Proposed Substitution: _____

Attach complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

Submit, with request, all necessary samples and substantiating data to prove equal quality and performance to that which is specified. Clearly mark manufacturer's literature to indicate equality in performance.

Substitutions of the materials and equipment described in the Contract Documents will be considered during the bidding period upon receipt or a written request to the Architect for approval up to ten (10) days before receipt of bids. Verbal or written requests without the completed Substitution Request Form will not be considered.

CERTIFICATION OF EQUAL PERFORMANCE AND ASSUMPTION OF LIABILITY FOR EQUAL PERFORMANCE

The undersigned states that the function, appearance, and quality are equivalent or superior to the specified item.

Submitted by:

Signature

Firm

Address

Telephone Email Date

Signature shall be by person having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

Fill in Blanks Below:

- A. Does the substitution affect dimensions shown on Drawings? Yes No

If yes, clearly indicate changes:

- B. Will the undersigned pay for changes to the building design, including engineering and detailing costs caused by the requested substitution? Yes No

If no, fully explain:

C. What effect does substitution have on other Contracts or other trades?

D. What effect does substitution have on construction schedule?

E. Manufacturer's warranties of the proposed and specified items are:

_____ Same _____ Different (Explain on Attachment)

F. Reason for Request:

G. Itemized comparison of specified item(s) with the proposed substitution.

List significant variations:

H. Accurate cost data comparing proposed substitution with product specified:

I. Designation of maintenance services and sources:

(ATTACH ADDITIONAL SHEETS IF REQUIRED)

FOR USE BY DESIGN PROFESSIONAL:

_____ Recommended _____ Recommended as Noted

_____ Not Recommended _____ Received Too Late

Signed By _____

Date _____

FOR USE BY OWNER'S REPRESENTATIVE OR OWNER:

_____ Approved _____ Approved as Noted

_____ Not Approved _____ Approved Too Late

Signed By _____

Date _____

END OF SECTION

SECTION 017000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Examination, preparation, and general installation procedures.
- B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.
- C. Cutting and patching.
- D. Surveying for laying out the work.
- E. Cleaning and protection.
- F. Starting of systems and equipment.
- G. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.
- H. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

- A. Section 011000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.
- B. Section 013000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.
- C. Section 014000 - Quality Requirements: Testing and inspection procedures.
- D. Section 015000 - Temporary Facilities and Controls: Temporary interior partitions.
- E. Section 015100 - Temporary Utilities: Temporary heating, cooling, and ventilating facilities.
- F. Section 017419 - Construction Waste Management and Disposal: Additional procedures for trash/waste removal, recycling, salvage, and reuse.
- G. Section 017800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties .
- H. Section 078400 - Firestopping.

1.03 REFERENCE STANDARDS

- A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. 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.
 - 4. Visual qualities of sight exposed elements.
 - 5. Work of Owner or separate Contractor.
 - 6. Include in request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work and products to be used.
 - e. Effect on work of Owner or separate Contractor.
 - f. Written permission of affected separate Contractor.
 - g. Date and time work will be executed.
- C. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 PROJECT CONDITIONS

- A. Use of explosives is not permitted.
- B. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- C. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
 - 1. Provide dust-proof barriers between construction areas and areas continuing to be occupied by Owner.
- D. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations once the new school year has begun.
 - 1. Indoors: Limit conduct of especially noisy interior work to 3:30 pm to 8 am.
- E. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.
- F. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
- 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.

1.06 COORDINATION

- A. See Section 011000 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, with provisions for accommodating items installed later.
- 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. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- F. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.
- G. Coordinate completion and clean-up of work of separate sections.
- H. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS**2.01 PATCHING MATERIALS**

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

PART 3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 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 elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
 - 1. Grid or axis for structures.

3.04 GENERAL INSTALLATION REQUIREMENTS

- A. In addition to compliance with regulatory requirements, conduct construction operations in compliance with NFPA 241, including applicable recommendations in Appendix A.
- B. 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.
- C. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.
- D. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.
- E. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.
- F. Make neat transitions between different surfaces, maintaining texture and appearance.

3.05 ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of alterations work constitutes acceptance of existing conditions.
- B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.
- C. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.
 - 2. Relocate items indicated on drawings.
 - 3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
 - 4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.
- D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
 - 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
 - 2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
 - 3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 - a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
 - b. See Section 011000 for other limitations on outages and required notifications.
 - c. Provide temporary connections as required to maintain existing systems in service.
 - 4. Verify that abandoned services serve only abandoned facilities.
 - 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.
- E. Protect existing work to remain.
 - 1. Prevent movement of structure; provide shoring and bracing if necessary.
 - 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 - 3. Repair adjacent construction and finishes damaged during removal work.
- F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.
 - 1. When existing finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.
 - 2. Where removal of partitions or walls results in adjacent spaces becoming one, rework floors, walls, and ceilings to a smooth plane without breaks, steps, or bulkheads.
 - 3. Where a change of plane of 1/4 inch or more occurs in existing work, submit recommendation for providing a smooth transition for Architect review and request instructions.

- G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.
- H. Refinish existing surfaces as indicated:
 - 1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
 - 2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.
- I. Clean existing systems and equipment.
- J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.
- K. Do not begin new construction in alterations areas before demolition is complete.
- L. Comply with all other applicable requirements of this section.

3.06 CUTTING AND PATCHING

- A. Whenever possible, execute the work by methods that avoid cutting or patching.
- B. See Alterations article above for additional requirements.
- C. Perform whatever cutting and patching is necessary to:
 - 1. Complete the work.
 - 2. Fit products together to integrate with other work.
 - 3. Provide openings for penetration of mechanical, electrical, and other services.
 - 4. Match work that has been cut to adjacent work.
 - 5. Repair areas adjacent to cuts to required condition.
 - 6. Repair new work damaged by subsequent work.
 - 7. Remove and replace defective and non-complying work.
- D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.
- E. 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 tightly 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 in accordance with Section 078400, 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.

3.07 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.

3.08 PROTECTION OF EXISTING AND 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. Protect work from spilled liquids. If work is exposed to spilled liquids, immediately remove protective coverings, dry out work, and replace protective coverings.
- G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.09 SYSTEM STARTUP

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect and Owner seven days prior to start-up of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable Contractor personnel in accordance with manufacturers' instructions.
- G. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.10 ADJUSTING

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

3.11 FINAL CLEANING

- A. Owner will provide comprehensive cleaning after final acceptance.
- B. Use cleaning materials that are nonhazardous.
- 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. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

- A. Make submittals that are required by governing or other authorities.
 - 1. Provide copies to Architect and Owner.
- B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.
- C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.
- D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in

accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

- E. Owner will occupy all of the building as specified in Section 011000.
- F. 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.
- G. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.
- H. Accompany Project Coordinator on Contractor's preliminary final inspection.
- I. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.
- J. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

END OF SECTION

SECTION 017419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL**1.01 WASTE MANAGEMENT REQUIREMENTS**

- A. Owner requires that this project generate the least amount of trash and waste possible.
- B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.
- C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.
- D. Methods of trash/waste disposal that are not acceptable are:
 - 1. Burning on the project site.
 - 2. Burying on the project site.
 - 3. Dumping or burying on other property, public or private.
 - 4. Other illegal dumping or burying.
- E. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 RELATED REQUIREMENTS

- A. Section 013000 - Administrative Requirements: Additional requirements for project meetings, reports, submittal procedures, and project documentation.
- B. Section 015000 - Temporary Facilities and Controls: Additional requirements related to trash/waste collection and removal facilities and services.
- C. Section 016000 - Product Requirements: Waste prevention requirements related to delivery, storage, and handling.
- D. Section 017000 - Execution and Closeout Requirements: Trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

1.03 DEFINITIONS

- A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.
- B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.
- C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.
- D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.
- E. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.
- F. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.
- G. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.
- H. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.04 SUBMITTALS

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

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 WASTE MANAGEMENT PROCEDURES

- A. See Section 011000 for list of items to be salvaged from the existing building for relocation in project or for Owner.
- B. See Section 013000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.
- C. See Section 015000 for additional requirements related to trash/waste collection and removal facilities and services.
- D. See Section 016000 for waste prevention requirements related to delivery, storage, and handling.
- E. See Section 017000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

3.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

- A. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.
- B. Meetings: Discuss trash/waste management goals and issues at project meetings.
 - 1. Preconstruction meeting.
 - 2. Regular job-site meetings.
- C. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

END OF SECTION

SECTION 017800
CLOSEOUT SUBMITTALS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

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

1.03 SUBMITTALS

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

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. 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. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 2. Field changes of dimension and detail.
 3. 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.
 2. Information for re-ordering custom manufactured products.
- B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.
- C. Additional information as specified in individual product specification sections.
- D. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

- A. For Each Item of Equipment and Each System:
 1. Description of unit or system, and component parts.
 2. Identify function, normal operating characteristics, and limiting conditions.
 3. Include performance curves, with engineering data and tests.
 4. Complete nomenclature and model number of replaceable parts.
- B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.
- C. Include color coded wiring diagrams as installed.
- D. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
- E. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
- F. Provide servicing and lubrication schedule, and list of lubricants required.
- G. Include manufacturer's printed operation and maintenance instructions.
- H. Include sequence of operation by controls manufacturer.

- I. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- J. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- K. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- L. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

- A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.
- B. Where systems involve more than one specification section, provide separate tabbed divider for each system.
- C. Binders: Commercial quality, 8-1/2 by 11 inch 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.
- D. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.
- E. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.
- F. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.
- G. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.
- H. Text: Manufacturer's printed data, or typewritten data on 20 pound paper.
- I. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- J. Arrangement of Contents: Organize each volume in parts as follows:
 - 1. Project Directory.
 - 2. Table of Contents, of all volumes, and of this volume.
 - 3. Operation and Maintenance Data: Arranged by system, then by product category.
 - a. Source data.
 - b. Product data, shop drawings, and other submittals.
 - c. Operation and maintenance data.
 - d. Field quality control data.
 - e. Original warranties and bonds.

3.06 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.
- 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.

END OF SECTION

SECTION 017900
DEMONSTRATION AND TRAINING

PART 1 GENERAL**1.01 SUMMARY**

- A. Demonstration of products and systems where indicated in specific specification sections.
- B. Training of Owner personnel in operation and maintenance is required for:
 - 1. All software-operated systems.
 - 2. HVAC systems and equipment.
 - 3. Plumbing equipment.
 - 4. Electrical systems and equipment.
 - 5. Items specified in individual product Sections.
- C. Training of Owner personnel in care, cleaning, maintenance, and repair is required for:
 - 1. Finishes, including flooring, wall finishes, ceiling finishes.
 - 2. Fixtures and fittings.
 - 3. Items specified in individual product Sections.

1.02 RELATED REQUIREMENTS

- A. Section 017800 - Closeout Submittals.
- B. Other Specification Sections: Additional requirements for demonstration and training.

1.03 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate work with preparation of operation and maintenance data specified in Section 017800.
- B. Scheduling:
 - 1. Schedule work to ensure training sessions are completed prior to Request for Substantial Completion Inspection.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Training Plan: Owner will designate personnel to be trained; tailor training to needs and skill-level of attendees.
 - 1. Submit to Architect for transmittal to Owner.
 - 2. Submit not less than four weeks prior to start of training.
 - 3. Revise and resubmit until acceptable.
 - 4. Provide an overall schedule showing all training sessions.
 - 5. Include at least the following for each training session:
 - a. Identification, date, time, and duration.
 - b. Description of products and/or systems to be covered.
 - c. Name of firm and person conducting training; include qualifications.
 - d. Intended audience, such as job description.
 - e. Objectives of training and suggested methods of ensuring adequate training.
 - f. Methods to be used, such as classroom lecture, live demonstrations, hands-on, etc.
 - g. Media to be used, such as slides, hand-outs, etc.
 - h. Training equipment required, such as projector, projection screen, etc., to be provided by Contractor.
- C. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
 - 1. Include applicable portion of O&M manuals.
 - 2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
 - 3. Provide one extra copy of each training manual to be included with operation and maintenance data.

1.05 QUALITY ASSURANCE

- A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
 - 1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
 - 2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED**PART 3 EXECUTION****3.01 DEMONSTRATION - GENERAL**

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

3.02 TRAINING - GENERAL

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

9. Review recommended tools and spare parts inventory suggestions of manufacturers.
 10. Review spare parts and tools required to be furnished by Contractor.
 11. Review spare parts suppliers and sources and procurement procedures.
- G. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 024100
DEMOLITION

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Selective demolition of building elements for alteration purposes.
- B. Abandonment and removal of existing utilities, utility structures and below-grade construction.

1.02 RELATED REQUIREMENTS

- A. Section 011000 - Summary: Limitations on Contractor's use of site and premises.
- B. Section 011000 - Summary: Description of items to be removed by Owner.
- C. Section 011000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.
- D. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.
- E. Section 016000 - Product Requirements: Handling and storage of items removed for salvage and relocation.
- F. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.
- G. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.04 REFERENCE STANDARDS

- A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards.
- B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations.

1.05 ADMINISTRATIVE REQUIREMENTS

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

1.06 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
 - 1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.

2. Include measures for environmental protection, for dust control, and for noise control.
 3. Detail special measures proposed to protect adjacent buildings or spaces to remain including means of egress.
 4. Include a summary of safety procedures.
- C. Inventory of items that have been removed and salvaged.
- D. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.07 QUALITY ASSURANCE

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

1.08 FIELD CONDITIONS

- A. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
1. Provide not less than 72 hours notice of activities that will affect operations of adjacent occupied buildings.
 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- B. Notify Architect of discrepancies between existing conditions and the Drawings before proceeding with selective demolition.
- C. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
- E. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
- F. On-site storage or sale of removed items or materials is not permitted.
- G. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 SCOPE

- A. Remove portions of existing building as indicated in demolition plans.
- B. Remove other items indicated, for salvage and relocation.
- C. Fill openings or penetrations as result of removals, firestop at rated walls as indicated in code plan.

3.02 MATERIALS OWNERSHIP

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

3.03 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition.

- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.

3.04 GENERAL PROCEDURES AND PROJECT CONDITIONS

- A. Comply with other requirements specified in Section 017000.
- B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
 - 1. Obtain required permits.
 - 2. Comply with applicable requirements of NFPA 241.
 - 3. Use of explosives is not permitted.
 - 4. 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.
 - 5. Provide, erect, and maintain temporary barriers and security devices.
 - 6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
 - a. Remove temporary barriers and protections where hazards no longer exist.
 - 7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
 - 8. Do not close or obstruct roadways or sidewalks without permit.
 - 9. 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.
 - 10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.
- C. Do not begin removal until receipt of notification to proceed from Owner.
- D. Do not begin removal until built elements to be salvaged or relocated have been removed.
- E. Survey existing conditions of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations. Notify Architect or Engineer of any concerns.
- F. 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.
- G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.
- H. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.05 EXISTING UTILITIES

- A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.
- B. Protect existing utilities to remain from damage.
- C. Do not disrupt public utilities without permit from authority having jurisdiction.
- D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.
- E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior notification to Owner.
- F. Verify that utilities have been disconnected and capped before starting demolition operations.

- G. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.
- H. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.
- I. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.06 SELECTIVE DEMOLITION FOR ALTERATIONS

- A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
 - 1. Verify that construction and utility arrangements are as indicated.
 - 2. Report discrepancies to Architect before disturbing existing installation.
 - 3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.
- B. Cooperate with the Owner and Authorities Having Jurisdiction to provide Interim Life Safety Measures (ILSM) in all areas affected by demolition or construction operations.
 - 1. Ensure exits provide an unobstructed egress. Building areas under construction must maintain escape facilities for construction workers at all times. Provide alternate routes around closed or obstructed traffic-ways if required by authorities having jurisdiction.
 - 2. Ensure fire alarm, detection and suppression systems are not impaired. Provide temporary systems if necessary.
 - 3. Ensure temporary construction partitions are smoke-tight and built of non-combustible or limited combustible materials that will not contribute to the development or spread of fire.
 - 4. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
 - 5. Develop and enforce storage, housekeeping, and debris removal practices that reduce the flammable and combustible fire load of the building to the lowest level necessary for daily operations as stated in the general conditions.
 - 6. Provide hazard surveillance of building, grounds, and equipment with attention to construction areas, construction storage, and field offices.
 - 7. Follow NFPA 241 guidelines pertaining to safe-guarding for construction and demolition processes.
 - 8. Follow NFPA 1 guidelines pertaining to fire prevention measures.
- C. Separate areas in which demolition is being conducted from other areas that are still occupied.
 - 1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.
- D. Structural Demolition:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain fire watch during and for at least 24 hours after flame-cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.
- E. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.
- F. Salvaged Items: Comply with the following:
 - 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Transport items to storage area designated by Owner.
 - 5. Protect items from damage during transport and storage.
- G. Remove existing work as indicated and as required to accomplish new work.
 - 1. Remove items indicated on drawings.

2. Inventory and record the condition of items to be removed and salvaged.
- H. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
 1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
 2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
 3. See Section 011000 for other limitations on outages and required notifications.
 4. Verify that abandoned services serve only abandoned facilities before removal.
 5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.
- I. Protect existing work to remain.
 1. Prevent movement of structure; provide shoring and bracing if necessary.
 2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
 3. Repair adjacent construction and finishes damaged during removal work.
 4. Patch as specified for patching new work.

3.07 DEBRIS AND WASTE REMOVAL

- A. Remove debris, junk, and trash from site.
 1. Do not allow demolished materials to accumulate on-site.
 2. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 3. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 4. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 5. General Contractor will provide dumpster and coordinate with waste hauler for drop off and pick-up.
 6. Dumpster to be located as agreed upon at Pre-Bid meeting or by Owner.
- B. Remove from site all materials not to be reused on site; comply with requirements of Section 017419 - Waste Management.
- C. Leave site in clean condition, ready for subsequent work.
- D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 033000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Floors and slabs on grade.
- B. Concrete floor patching (slab on grade and elevated slabs).
- C. Thickened floor slab footings
- D. Concrete reinforcement.
- E. Joint devices associated with concrete work.
- F. Miscellaneous concrete elements, including bonding and jointing products.
- G. Concrete curing.
- H. Drainage Course.
- I. Accessories, including under-slab vapor retarder.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

1.03 REFERENCE STANDARDS

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
- C. ACI 301 - Specifications for Structural Concrete.
- D. ACI 302.1R - Guide for Concrete Floor and Slab Construction.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete.
- F. ACI 308R - Guide to Curing Concrete.
- G. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.
- H. ACI 347R - Guide to Formwork for Concrete.
- I. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- J. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- K. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete.
- L. ASTM C33/C33M - Standard Specification for Concrete Aggregates.
- M. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- N. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
- O. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens).
- P. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete.
- Q. ASTM C150/C150M - Standard Specification for Portland Cement.
- R. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
- S. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
- T. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.

- U. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
- V. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing.
- W. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.
- X. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete.
- Y. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
- Z. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
- AA. ASTM D8139 - Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.
- AB. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- AC. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.

1.04 SUBMITTALS

- A. See Section 01 33 23 - Submittals, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
 - 1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
- 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.
 - 3. Submit proposed concrete mix designs for review with field tests or design documentation to substantiated design strength for each concrete mixture. Submit alternate design mixtures when characteristics of material, Project conditions, weather, test results or other circumstances warrant adjustment.
- D. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.

2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
 - 1. Form: Flat sheets or coiled rolls.

2. Mesh Size: As indicated on drawings.
 3. Wire Gage: As indicated on drawings.
- C. 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.
 3. Provide stainless steel, galvanized, plastic, or plastic coated steel components for placement within 1-1/2 inches of weathering surfaces.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal or Type III - High Early Strength Portland type.
1. Acquire cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C33/C33M.
1. Where concrete is to be exposed to view, do not use aggregate containing iron or other staining elements.
 2. Fine aggregate for slab on grade and suspended slabs: In addition to requirements above, provide imported sand free of materials with deleterious reactivity to alkali in cement.
 3. Maximum Coarse-Aggregate Size: 1/3 slab thickness.
- 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.
1. Products: "Emsac F 100" manufactured by Elkem Chemical, Inc; "Eucon MSA" manufactured by Euclid Chemical Company; "Force 10,000" manufactured by W. R. Grace and Co; or approved equivalent.
- 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. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
1. Products: "Glenium Series" manufactured by BASF; "Eucon 537" manufactured by Euclid Chemical Company; "Daracem Series" manufactured by W. R. Grace and Co; or approved equivalent.
- C. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
1. Products: "Rheobuild 1000" manufactured by BASF; "Eucon 37" manufactured by Euclid Chemical Company; "Daracem Series" manufactured by W. R. Grace and Co; or approved equivalent.
- D. Non-Chloride, Non-Corrosive Accelerating Admixture: ASTM C494/C494M; Type C or E, and not contain more chloride ions than are present in municipal drinking water.
1. Products: "Pozzolith NC 534" manufactured by BASF; "Accelguard 80" manufactured by Euclid Chemical Company; "Daraset Series" manufactured by W. R. Grace and Co; or approved equivalent.
- E. Water Reducing Admixture: ASTM C494/C494M Type A.
1. Products: "Pozzolith Series" manufactured by BASF; "Eucon Series" manufactured by Euclid Chemical Company; "WRDA Hycol" manufactured by W. R. Grace and Co; or approved equivalent.
- F. Calcium chloride is not permitted.

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. Application: vapor retarder at new trenches in slab-on-grade locations. Tie into existing to extent feasible.
2. Thickness: 15 mils, minimum
3. Permeance: less than 0.01 perms after mandatory conditioning tests per ASTM E1745 (7.1.1 to 7.1.5)
4. Installation: Comply with ASTM E1643.
5. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
6. Manufacturers:
 - a. Barrier-Bac: VB-350
 - b. Epro Services: Ecoshield E15
 - c. Flatiron Films: Iron Barr 15
 - d. Fortifiber Building Systems Group: Moistop 15; www.fortifiber.com/#sle.
 - e. Grace Construction Products; Florprufe 120.
 - f. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
 - g. Raven Industries: VaporBlock VB15
 - h. BASIS OF DESIGN: Stego Industries, LLC; Stego Wrap 15 mil Class A: www.stegoindustries.com/#sle.
 - i. W. R. Meadows, Inc; PERMINATOR Class A - 10 mils (0.25 mm): www.wrmeadows.com/#sle.
 - j. Substitutions: See Section 016000 - 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.
 2. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
 3. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.

2.06 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
 1. Manufacturers:
 - a. Kaufman Products Inc; SureBond: www.kaufmanproducts.net/#sle.
 - b. SpecChem, LLC; Strong Bond Acrylic Bonder: www.specchemllc.com/#sle.
 - c. W. R. Meadows, Inc; ACRY-LOK-: www.wrmeadows.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
- B. Epoxy Bonding System: for structural load-bearing applications and non-loadbearing applications where applied to damp surfaces or curing will occur under humid conditions
 1. Complying with ASTM C881/C881M and of Type required for specific application.
 2. Manufacturers:
 - a. Adhesives Technology Corporation; Crackbond SLV-302, Crackbond LR-321, Crackbond LR-321 LPL, Ultrabond 2100 LPL, Ultrabond 2100, Ultrabond 1, Ultrabond 2, or Ultrabond HS200: www.atcepoxy.com/#sle.
 - b. Euclid Chemical Company; DURALFLEX LV: www.euclidchemical.com/#sle.
 - c. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - d. Kaufman Products Inc; SurePoxy HM EPL: www.kaufmanproducts.net/#sle.
 - e. SpecChem, LLC; SpecPoxy 1000, SpecPoxy 2000, SpecPoxy 3000, or SpecPoxy 3000FS: www.specchemllc.com/#sle.
 - f. W. R. Meadows, Inc; Rezi-Weld Gel Paste, Rezi-Weld Gel Paste State, Rezi-Weld 1000: www.wrmeadows.com/#sle.
 - g. Substitutions: See Section 016000 - Product Requirements.
- C. 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.
 1. Material: ASTM D8139, semi-rigid, closed-cell polypropylene foam.
 2. Manufacturers:

- a. Nomaco, Inc; Nomaflex Expansion Joint Filler with Void Cap Option:
www.nomaco.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- D. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with 1 inch diameter knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
 2. Height: To suit slab thickness.

2.07 CURING MATERIALS

- A. Curing and Sealing Compound, Low Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
1. Solids by Mass: 25 percent, minimum.
 2. Manufacturers:
 - a. Euclid Chemical Company; SUPER DIAMOND CLEAR:
www.euclidchemical.com/#sle.
 - b. L & M construction Chemicals, a subsidiary of Laticrete International, Inc.; DRESS & SEAL WB.
 - c. Kaufman Products Inc; Krystal 25: www.kaufmanproducts.net/#sle.
 - d. TK Products; TK-Kure & Seal 1315.
 - e. W. R. Meadows, Inc; VOCOMP-25: www.wrmeadows.com/#sle.
 - f. Substitutions: See Section 016000 - Product Requirements.
- B. Moisture-Retaining Sheet: ASTM C171. Provide one of the following:
1. Polyethylene film, clear or white opaque, minimum nominal thickness of 4 mil, 0.004 inch.

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. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.
- C. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
- D. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch.
 2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
 3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
 4. Silica Fume Content: Maximum 10 percent of cementitious materials by weight.
 5. Water-Cement Ratio: Maximum 45 percent by weight.
 6. Total Air Content: 6 percent, plus or minus 1.5 percent at point of delivery; determined in accordance with ASTM C173/C173M.
 - a. Do not allow air content of trowel finished floors to exceed 3 percent.
 7. Maximum Slump: As determined by ASTM C143 with tolerances as established by ASTM C94, and as follows:
 - a. Reinforced Footings, Substructure Walls, and Slabs: 3 inches.
 - b. Slump may be increased by the use of approved high-range water-reducing admixture (superplasticizer). Tolerances as established by ASTM C94/C94M. Concrete containing the high-range water-reducing admixture may have a maximum slump of 9 inches. The concrete shall arrive at the job site at a slump of 2 to 4 inches. This should be verified, and then high-range water-reducing admixture added to increase the slump to the approved level.

8. **Maximum Aggregate Size:** Maximum aggregate size not to exceed one-fifth of the narrowest dimension between the sides of the forms, one-third of the depth of slabs, nor three quarters of the minimum clear spacing between individual reinforcing bars or prestressing tendons. Comply with requirements of ACI 318.
9. **Combination of Fly Ash, Slag and other Pozzolans:** Maximum 50 percent, but not less than 40 percent of cementitious materials by weight.

2.09 MIXING

- A. **On Project Site:** Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
- B. **Transit Mixers:** Comply with ASTM C94/C94M.
- C. **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.
 1. **Exception:** If concrete batch ticket indicates that the amount of water in the mix design was not fully added at the plant, then that amount of water may be added under the direct supervision of the Owner's testing agency representative.

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. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- C. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 2. Use latex bonding agent only for non-load-bearing applications.
- D. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- E. **Interior Slabs on Grade:** Install vapor retarder under interior slabs on grade. Tie into existing where possible. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

3.03 INSTALLING REINFORCEMENT AND OTHER EMBEDDED ITEMS

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- B. Clean reinforcement of loose rust and mill scale, earth, ice and other foreign materials.
- C. Accurately position, support and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- E. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.
 1. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

3.04 PLACING CONCRETE

- A. Do not add water to concrete during delivery or at Project site, except as follows: If concrete batch ticket indicates that the amount of water in the mix design was not fully added at the plant, then that amount of water may be added under the direct supervision of the Owner's testing agency representative.
- B. Place concrete in accordance with ACI 304R.
- C. Place concrete for floor slabs in accordance with ACI 302.1R.
- D. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or derbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Do not interrupt successive placement; do not permit cold joints to occur.
- G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.05 SLAB JOINTING

- A. Locate joints as indicated on drawings.
 - 1. If not indicated, Contractor to submit control joint layout for Architect/Engineer approval.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Locate joints for slabs in the middle third of spans.
 - 3. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces unless noted otherwise.
- D. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth as shown on drawings, as follows:
 - 1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch wide joints into concrete when cutting action will not tear, abrade or otherwise damage surface and before concrete develops random contraction cracks.
- E. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams and other locations, as indicated.
 - 1. Extend joint fillers full width and 1/2 inch less than full depth of joint. Protect top edge of joint filler during concrete placement with plastic or other temporary preformed cap to permit installation of joint sealant. Remove protective cap after concrete has been placed on both sides of joint and install sealant per requirements of Section 07 92 00.
 - 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. Maximum Variation of Surface Flatness:
 - 1. Exposed Concrete Floors: 1/4 inch in 10 feet.
 - 2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
 - 3. Under Carpeting: 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. 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, and thin set ceramic tile.
 - 2. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
- B. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

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.
 - 1. Normal concrete: Not less than seven days.
 - 2. High early strength concrete: Not less than four days.
- C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- D. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 - 2. Curing and Sealing Compound: When used on existing concrete slabs, surfaces must be dry and clean of all prior sealers, curing compound, oils, or other foreign materials that might prevent penetration or adhesion and meet a Concrete Surface Profile (CSP) of 1, as determined by the International Concrete Repair Institute. Grind, acid etch, power wash, or scrub surfaces with stiff bristle brushes and strong detergents to remove these undesired materials and any loose concrete laitance that may harm adhesion.
 - a. Rinse concrete surfaces and allow them to completely dry prior to application.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - 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. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.
- G. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- H. Copies of test reports will be provided to structural engineer, general contractor, concrete contractor, and concrete manufacturer.

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.

END OF SECTION

SECTION 042000
UNIT MASONRY

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Concrete block.
- B. Mortar and grout.
- C. Reinforcement and anchorage.
- D. Installation of Lintels.
- E. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 014533 - Code-Required Testing and Special Inspections
- B. Section 055000 - Metal Fabrications: Loose steel lintels and Fabricated steel items.
- C. Section 079200 - Joint Sealants: Sealing control and expansion joints.
- D. Section 092123 - Interior Painting; finish for lintels where indicated.

1.03 REFERENCE STANDARDS

- A. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
- B. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- C. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement.
- D. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
- E. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units.
- F. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
- G. ASTM C476 - Standard Specification for Grout for Masonry.
- H. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry.
- I. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for masonry support system.
- D. Steel Reinforcement Shop Drawings: Prepare Shop Drawings showing details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement".
 - 1. Include material, grade, bar schedules, tie and/or stirrup spacing, splices, bent bar diagrams, and other arrangements and assemblies required for fabrication and placement of reinforcement for masonry work.
 - 2. Show all walls in plan and elevation.
- E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports for mortar mixes required to comply with property specification. Test according to ASTM C 109/C 109M for compressive strength, ASTM C 1506 for water retention, and ASTM C 91 for air content.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.
- B. See Section 014533 for testing and inspection requirements. Testing and inspection shall comply with the requirements of the governing edition of the IBC.
- C. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.
- D. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.
- E. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.
- F. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.
- B. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos.
- C. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
- D. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

1.07 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.
- B. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect sills, ledges, and projections from mortar droppings.
 - 2. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 3. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

PART 2 PRODUCTS**2.01 UNIT MASONRY - GENERAL**

- A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.02 CONCRETE MASONRY UNITS

- A. Concrete Block: Comply with referenced standards and as follows:
 - 1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
 - 2. Special Shapes: Provide non-standard blocks configured for corners, lintels, headers, and other detailed conditions.
 - a. Provide bullnose units for outside corners.
 - b. Provide finished edge blocks at exposed outside corners or end walls.

3. Non-Loadbearing Units: ASTM C129.
 - a. Hollow block, as indicated.
 - b. Normal weight.

2.03 MORTAR AND GROUT MATERIALS

- A. Use only factory premixed packaged dry materials for mortar and grout, with addition of water only at project site.
- B. Water: Clean and potable.
- C. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 1. Type: Type O.
 2. Color: Standard gray.
 3. Manufacturers:
 - a. Amerimix, an Oldcastle brand; AMX 405C: www.amerimix.com/#sle.
 - b. Cemex; USA; Masonry Mortar; www.cemexusa.com.
 - c. SpecMix; Portland, Lime and Sand Mortar; www.specmix.com.
 - d. Substitutions: See Section 016000 - Product Requirements.

2.04 REINFORCEMENT AND ANCHORAGE

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi), deformed billet bars; uncoated.
- B. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.
- C. Single Wythe Joint Reinforcement: ASTM A951/A951M.
 1. Type: Ladder.
 2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3.
 3. Size: 0.1483 inch side rods with 0.1483 inch cross rods; width as required to provide not less than 5/8 inch of mortar coverage on each exposure.
 4. Manufacturers:
 - a. Hohmann & Barnard, Inc.; 220 Ladder Mesh.
 - b. Wire Bond; Series 200 Ladder Mesh.
- D. Masonry Wall Stabilizing Anchor Cap: 12 gage steel channel with 2-3 inch legs, used to resist lateral loads at the top of a masonry wall and allow for vertical deflection; galvanized to ASTM A153/A153M.
 1. Size: 8-inch lengths by width to match cmu block depth
 2. Manufacturers:
 - a. Heckmann Building Products; Partition Top Anchor #420; www.heckmannbuildingprods.com
 - b. Hohmann & Barnard, Inc; Partition Top Anchor PTA 422; www.h-b.com
 - c. WIRE-BOND; #4310 Partition Top Anchor: www.wirebond.com.
 - d. Substitutions: See Section 01 6000 - Product Requirements.

2.05 MISCELLANEOUS ANCHORS

- A. Postinstalled Anchors: Torque-controlled expansion anchors or chemical anchors.
 1. Structural Applications:
 - a. As indicated.
 2. Non-Structural Applications:
 - a. Acceptable Manufacturers and products:
 - 1) Hilti Fastening Systems
 - (a) Kwik Bolt III Expansion Anchor
 - (b) HIT HY 70
 - 2) ITW Red Head:
 - (a) Trubolt Wedge Anchor

- (b) Epcon C6 Adhesive.
- 3) Powers Fastening Inc:
 - (a) Power-Stud Expansion Anchor
 - (b) PE1000+ Adhesive.
- 4) Or approved equivalent.
- 3. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5 unless otherwise indicated.

2.06 ACCESSORIES

- A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
- B. Joint Filler: Closed cell polypropylene; oversized 50 percent to joint width; self expanding; 3/8 inch wide by maximum lengths available.
- C. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 LINTELS

- A. Steel Lintels: See Section 055000 - Metal Fabrications and Structural Drawings.

2.08 MORTAR AND GROUT MIXING

- A. Mortar for Unit Masonry: ASTM C270, using the Property Specification.
 - 1. Interior, non-loadbearing masonry: Type O.
- B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
 - 1. Minimum compressive strength: 2000 psi.
- C. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.
- D. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Running.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.
 - a. Flush where concealed or receiving resilient base.

3.04 PLACING AND BONDING

- A. Lay hollow masonry units with face shell bedding on head and bed joints.
- B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

- C. Remove excess mortar and mortar smears as work progresses.
- D. Interlock intersections and external corners.
- E. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- F. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- G. Cut mortar joints flush where resilient base is scheduled.
- H. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.05 REINFORCEMENT AND ANCHORAGE - GENERAL AND SINGLE WYTHE MASONRY

- A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place continuous joint reinforcement in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches.
- E. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.
- F. See Grouting Article for vertical reinforcement.

3.06 LINTELS

- A. Install loose steel lintels over openings. See Structural Notes and drawings for lintel sizing.
- B. Maintain minimum 8 inch bearing on each side of opening.

3.07 GROUTED COMPONENTS

- A. Reinforce masonry unit cores and cavities with reinforcing bars and grout as shown on structural drawings. Grout all cores containing rebar and as indicated on drawings.
 - 1. For non-structural walls shown on architectural drawings, use #5 vertical bars at 32 inches on center in fully grouted cores.
- B. Lap splices minimum 24 bar diameters.
- C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- D. Place and consolidate grout fill without displacing reinforcing.
- E. Grouting: Do not place grout until entire pour height of masonry to be grouted has attained enough strength to resist grout pressure.
 - 1. Comply with requirements in ACI 530.1/ASCE 6/TMS 602 for grout mix design, cleanouts, and for grout placement, including minimum grout space and maximum pour height. Cleanouts are required at the base of every vertical cell containing reinforcement where the grout pour height exceeds 12.67 feet (3862 mm).
- F. Limit height of vertical grout lifts to not more than 60 inches (1524 mm). ACI compliant procedure for higher grout lift may be submitted for approval. Place and consolidate grout fill without displacing reinforcing.
- G. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.
- H. Grout hollow metal frames installed into masonry walls.

3.08 CONTROL AND EXPANSION JOINTS

- A. Provide control joints in concrete masonry unit walls at the locations as indicated, or if not indicated at not more than 25-feet o.c. or at a panel ratio of not more than 1.5:1. Refer to NMCA TEK 10-2C for joint locations with respect to openings and corners.

- B. Do not continue horizontal joint reinforcement through control or expansion joints.
- C. Form control joint with a sheet building paper bond breaker fitted to one side of the hollow contour end of the block unit. Fill the resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- D. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

3.09 BUILT-IN WORK

- A. As work progresses, install built-in metal door frames, glazed frames, anchor bolts, and plates and other items to be built into the work and furnished under other sections.
- B. Install built-in items plumb, level, and true to line.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.
 - 1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build into masonry construction organic materials that are subject to deterioration.

3.10 TOLERANCES

- A. Maximum Variation from Alignment of Columns: 1/4 inch.
- B. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- C. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- D. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- E. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- F. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.
- G. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.11 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
- B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 014000 - Quality Requirements.

3.13 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

3.14 PROTECTION

- A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.
- B. During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
- C. Extend cover a minimum of 24 inches (600 mm) down both sides of walls and hold cover securely in place.
- D. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least three days after building masonry walls or columns.

- E. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
1. Protect base of walls from rain-splashed mud and from mortar splatter by spreading coverings on ground and over wall surface.
 2. Protect sills, ledges, and projections from mortar droppings.
 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt onto completed masonry.

END OF SECTION

SECTION 055000
METAL FABRICATIONS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Shop fabricated steel items, including:
- B. Miscellaneous angles, channels, tubes, plates, brackets and fasteners, as required to complete the project, including but not limited to:
 - 1. Loose angle lintels
- C. Slotted Channel Adjustable Framing System
- D. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Placement of metal fabrications in concrete.
- B. Section 042000 - Unit Masonry: Placement of metal fabrications in masonry.
- C. Section 099123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

- A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- C. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength.
- D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- E. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- F. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
- G. AWS D1.1/D1.1M - Structural Welding Code - Steel.
- H. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer.
- I. SSPC-SP 2 - Hand Tool Cleaning.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: provide for fabricated items listed in 1.01A above.
 - 1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 3. Where installing items to existing precast concrete, concrete or masonry, propose connections not detailed for structural engineer approval.

PART 2 PRODUCTS**2.01 MATERIALS - STEEL**

- A. Steel Sections: ASTM A36/A36M.
- B. Slotted Channel Framing: ASTM A653/A653M, Grade 33.
- C. Slotted Channel Fittings: ASTM A1011/A1011M.

- D. Bolts, Nuts, and Washers: ASTM A307, galvanized to ASTM A153/A153M where connecting galvanized components.
- E. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- F. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- G. Anchoring Devices:
 - 1. Anchor Rods: Anchor rods used with structural steel members shall be plain steel rods conforming to ASTM F1554 (Grade 36), complete with suitable nuts and washers, unless noted otherwise.
 - 2. Expansion Bolts: Expansion anchors shall consist of one-piece wedge type carbon steel anchor bolts with heavy-duty nuts and washers. All components shall be zinc plated in accordance with ASTM B633.
 - a. Structural Applications
 - 1) Acceptable products must have a valid and current ICC report, as listed at www.icc-es.org <<http://www.icc-es.org>>.
 - b. Non-Structural Applications
 - 1) Acceptable Manufacturers and products: Hilti Fastening Systems- Kwik Bolt III Anchor; ITW Red Head Mechanical Anchoring Systems - Trubolt Wedge Anchor; Powers Fastening Inc - Power-Stud Anchor; (or approved equivalent)
 - 3. Epoxy Adhesive Anchoring System: Epoxy anchoring shall consist of a threaded rod and the epoxy adhesive cartridge.
 - a. Structural Applications
 - 1) Acceptable products must have a valid and current ICC report, as listed at www.icc-es.org <<http://www.icc-es.org>>.
 - b. Non-Structural Applications
 - c. Acceptable Manufacturers and products: Hilti Fastening System - HIT RE 500; ITW Red Head Adhesive Anchoring Systems - Epcon C6 Adhesive; Powers Fastening Inc. - PE1000+; (or approved equivalent).
- H. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107/C 1107M and capable of developing a minimum compressive strength of 5,000 psi at 28 days.

2.02 FABRICATION

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the work.
- B. Fabricate units from steel shapes, plates, bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes and profiles indicated and as necessary to receive adjacent construction.
- C. Fit and shop assemble items in largest practical sections, for delivery to site.
- D. Fabricate items with joints tightly fitted and secured.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- G. Welded Joints: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings. Weld corners and seams continuously where visible or where exposed to moisture, even if intermittent or stitch welds are structurally adequate, and to comply with the following:
 - 1. Interior Components: Continuously seal joined pieces by continuous welds.
 - 2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

2.03 FABRICATED ITEMS

- A. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of other non-structural members; prime paint finish.
- B. Lintels: As detailed or as scheduled in Structural Notes; prime paint for field finish.
 - 1. Size loose lintels to provide bearing length at each side of opening to be 1/12 its length, but not less 8 inches, unless noted otherwise.
 - 2. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- C. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.
 - 1. Product: System of channel members and bolted connections fabricated to support loads without welded connections.
 - 2. Fittings and accessories shall be fabricated from hot rolled, pickled and oiled steel plates meeting the requirements of ASTM A 575.
 - 3. Nuts and screws shall be Unified and American coarse screw thread meeting the requirements of ASTM A 576 GR1015 (nut), and ASTM A 307 and SAE J429 GR2 (screw).
 - 4. Nuts and screws shall be electro-galvanized (EG) coated to commercial standards meeting the requirements of ASTM B 633 Type III SC1 finish.
 - 5. Finish: Adjustable framing shall be pre-finished with Unistrut's Perma-Green II; B-Line's Dura Green; or equal. All miscellaneous accessories, brackets, and fittings shall match framing.
 - 6. Manufacturer: Unistrut Corporation Unistrut; B-Line Systems, Inc. Powerstruct; or equal.

2.04 FINISHES - STEEL

- A. Prime paint steel items.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Prime Painting: One coat.

2.05 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch.
- C. Maximum Misalignment of Adjacent Members: 1/16 inch.
- D. Maximum Bow: 1/8 inch in 48 inches.
- E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Examine substrates and site area for conditions that might prevent satisfactory installation.
 - 1. Where installing items to existing precast concrete, concrete or masonry, propose connections not detailed for structural engineer approval.
- C. Verify that dimensions of supporting structure are within plus/minus 1/8 inch of dimensions shown on shop drawings.
- D. Verify that all adjacent painting, roofing, masonry work, and other work that might damage prefinished items has been completed prior to installation.

3.02 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.

- B. Supply setting templates to the appropriate entities for steel items required to be cast into concrete or embedded in masonry.
- C. Remove all mill scale, rust, grease, foreign matter and surface imperfections from steel components that will be painted to ensure a smooth, even appearance of finish.

3.03 INSTALLATION

- A. Install premanufactured items in accordance with manufacturer's installation instructions.
- B. Install items plumb and level, accurately fitted, free from distortion or defects.
- C. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components as indicated on shop drawings.
 - 1. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions.
- G. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag bolts, wood screws, and other connectors. Grout voids as required to result in secure installation.
- H. Touch-up damaged finish coating using material provided by manufacturer to match original coating.

3.04 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story or 10 feet, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch in 10 feet.
- C. Maximum Out-of-Position: 1/4 inch in 48 inches.

3.05 CLEANING

- A. Clean exterior surfaces of dust and debris; follow manufacturer's cleaning instructions for the finish used.

3.06 PROTECTION

- A. Protect items after installation to prevent damage due to other work until Date of Substantial Completion

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Fire retardant treated wood materials.
- B. Concealed wood blocking, nailers, and supports.

1.02 REFERENCE STANDARDS

- A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. AWPA U1 - Use Category System: User Specification for Treated Wood.
- C. PS 1 - Structural Plywood.
- D. PS 20 - American Softwood Lumber Standard.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.
- B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

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.
 - 4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.
- B. Engineered wood products containing added urea-formaldehyde are not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Sizes: Nominal sizes as indicated on drawings, S4S.
- B. Moisture Content: S-dry or MC19.
- C. Fire-retardant treated.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 1 or Construction Grade.
 - 2. Boards: Standard or No. 3.

2.03 CONSTRUCTION PANELS

- A. Concealed Backing for wall-mounted items- provide backing as required for loading from one of the following:
 - 1. Fire-Retardant treated.
 - 2. Dimension Lumber: as noted above
 - 3. Plywood: as noted below
 - 4. Proprietary fire-resistance-treated blocking and bracing in width indicated or required for loading: ClarkDietrich Building Systems LLC Danback Fire-Treated Wood Backing Plate.
- B. Plywood Applications:

1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

2.04 ACCESSORIES

- A. Fasteners and Anchors:
 1. Metal and Finish: Stainless steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
 2. Anchors: as follows:
 - a. Toggle bolt type for anchorage to hollow masonry.
 - b. Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
 - c. Bolt or ballistic fastener for anchorages to steel.
 3. Wood Screws: ASME B18.6.1.
 4. Lag Bolts: ASME B18.2.1
 5. Power Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ACC-ES AC70.

2.05 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. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
- B. Fire Retardant Treatment:
 1. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
 - a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
 - b. Treat rough carpentry items as indicated .
 - c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

PART 3 EXECUTION

3.01 PREPARATION

- A. 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.

3.04 CLEANING

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

END OF SECTION

SECTION 079200
JOINT SEALANTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Nonsag gunnable joint sealants.
- B. Self-leveling pourable joint sealants.
- C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 093000 - Tiling: Sealant between tile and plumbing fixtures and at junctions with other materials and changes in plane.

1.03 REFERENCE STANDARDS

- A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer.
- B. ASTM C834 - Standard Specification for Latex Sealants.
- C. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications.
- D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
- E. ASTM C1193 - Standard Guide for Use of Joint Sealants.
- F. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness.
- G. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
 - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
 - 2. List of backing materials approved for use with the specific product.
 - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
 - 4. Substrates the product should not be used on.
 - 5. Substrates for which use of primer is required.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Installation Log: Submit filled out log for each length or instance of sealant installed.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing the work of this section
- C. Installation Plan: Include schedule of sealed joints, including the following.
 - 1. Installation Log Form: Include the following data fields, with known information filled out.
 - a. Unique identification of each length or instance of sealant installed.
 - b. Location on project.
 - c. Substrates.
 - d. Sealant used.
 - e. Stated movement capability of sealant.

- f. Primer to be used, or indicate as "No primer" used.
- g. Size and actual backing material used.
- h. Date of installation.
- i. Name of installer.
- j. Actual joint width; provide space to indicate maximum and minimum width.
- k. Actual joint depth to face of backing material at centerline of joint.
- l. Air temperature.

1.06 FIELD CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or below 40 deg F.
 - 2. When substrates are wet.
 - 3. Where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
 - 4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.
- B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
 - 1. For silicone sealants within 20 years.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.
 - 1. Adhesives Technology Corporation: www.atcepoxy.com.
 - 2. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 - 3. Bostik Inc: www.bostik-us.com.
 - 4. Chem Link, Inc: www.chemlinkinc.com.
 - 5. Dow Corning Corporation: www.dowcorning.com/construction/sle.
 - 6. Fortifiber Building Systems Group: www.fortifiber.com/sle.
 - 7. Hilti, Inc: www.us.hilti.com/#sle.
 - 8. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com/sle.
 - 9. Pecora Corporation: www.pecora.com/?sle.
 - 10. Tremco Global Sealants: www.tremcosealants.com.
 - 11. Sherwin-Williams Company: www.sherwin-williams.com.
 - 12. Sika Corporation: www.usa-sika.com.
 - 13. W.R. Meadows, Inc: www.wrmeadows.com/sle.
 - 14. Substitutions: See Section 016000 - Product Requirements.
- B. Self-Leveling Sealants: Pourable or self-leveling sealant that has sufficient flow to form a smooth, level surface when applied in a horizontal joint.
 - 1. Adhesives Technology Corporation: www.atcepoxy.com.
 - 2. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
 - 3. Bostik Inc: www.bostik-us.com.
 - 4. Dayton Superior Corporation: www.daytonsuperior.com.
 - 5. Dow Corning Corporation: www.dowcorning.com/construction/sle.
 - 6. Pecora Corporation: www.pecora.com/?sle.
 - 7. The QUIKRETE Companies: www.quikrete.com.

8. Tremco Global Sealants: www.tremcosealants.com.
9. Sherwin-Williams Company: www.sherwin-williams.com.
10. Sika Corporation: www.usa-sika.com.
11. W.R. Meadows, Inc: www.wrmeadows.com/sle.
12. Substitutions: See Section 016000 - Product Requirements.

2.02 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

2.03 NONSAG JOINT SEALANTS

- A. Type 2 - Sanitary Sealant - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
 1. Color: White.
 2. Manufacturers:
 - a. BASF Building Systems; Omniplus.
 - b. Dow Corning Corporation; 786 Mildew Resistant.
 - c. GE Advanced Materials - Silicones; Sanitary SCS1700.
 - d. Owens Corning Corp.; 786 Mildew Resistant.
 - e. Pecora Corporation: www.pecora.com.
 - f. Sika Corporation; Sikasil GP: www.usa-sika.com/#sle.
 - g. Tremco Incorporated; Tremsil 200 Sanitary..
 3. Applications:
 - a. Joints between plumbing fixtures and floor and wall surfaces.
 - b. Joints between kitchen and bath countertops and wall surfaces.
- B. Polyurethane Sealant: ASTM C920, Grade NS, Use M ; multi-component; not expected to withstand continuous water immersion or traffic.
 1. Movement Capability: Plus and minus 50 percent, minimum.
 2. Color: To be selected by Architect from manufacturer's standard range.
 3. Manufacturers:
 - a. BASF Building Systems; Sonolastic NP2.
 - b. Substitutions: See Section 016000 - Product Requirements.
 4. Applications:
 - a. Precast to Precast joints.
- C. Type 3 - Wet Area Floor Sealant - Non-Sag "Traffic-Grade" Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
 1. Movement Capability: Plus and minus 25 percent, minimum.
 2. Hardness Range: 40 to 50, Shore A, when tested in accordance with ASTM C661.
 3. Color: To be selected by Architect from manufacturer's standard range.
 4. Service Temperature Range: Minus 40 to 180 degrees F.
 5. Applications:
 - a. Interior control and expansion joints in concrete floors considered wet areas.
- D. Type 4 - Acoustical Sealant - Acrylic-Urethane Sealant: Water-based; ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.
 1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
 2. Hardness Range: 15 to 40, Shore A, when tested in accordance with ASTM C661.
 3. Color: White.
 4. Applications:
 - a. In sound-rated wall assemblies, and where not indicated as fire-rated:

- 1) gaps between top stud runner and structure, between bottom stud track and floor, between gypsum wall board and floor, and between gypsum wall board and structure.
 - 2) gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
- E. Type 5 - General Purpose Interior Sealant - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, non-staining, non-bleeding, non-sagging; not intended for exterior use.
1. Color: Standard colors matching finished surfaces, Type OP (opaque).
 2. Grade: ASTM C834; Grade - NF.
 3. Manufacturers:
 - a. BASF Building Systems; Sonolac.
 - b. Bostik, Inc.; Chem-Calk 600.
 - c. Tremco Commercial Sealants & Waterproofing; Tremflex 834: www.tremcosealants.com/#sle.
 - d. Substitutions: See Section 016000 - Product Requirements.
 4. Applications:
 - a. Interior wall and ceiling control joints in non-wet areas.
 - b. Joints between door, window, and other frames and adjacent construction.
 - c. Other interior joints for which no other type of sealant is indicated.

2.04 SELF-LEVELING SEALANTS

- A. Type 8- Interior Slabs (unpolished) - Semi-Rigid Self-Leveling Epoxy Joint Filler: Epoxy or epoxy/polyurethane copolymer; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
1. Composition: Single or multi-component, 100 percent solids by weight.
 2. Durometer Hardness: Minimum of 85 for Type A or 35 for Type D, after seven days when tested in accordance with ASTM D2240.
 3. Color: To be selected by Architect from manufacturer's standard colors.
 4. Joint Width, Minimum: 1/8 inch.
 5. Joint Width, Maximum: 1/4 inch.
 6. Joint Depth: Provide product suitable for joints from 1/8 inch to 2 inches in depth including space for backer rod.
 7. Manufacturers:
 - a. Dayton Superior Corporation: www.daytonsuperior.com/#sle.
 - b. Euclid Chemical Company; EUCO 700: www.euclidchemical.com/#sle.
 - c. Nox-Crete; DynaFlex 502: www.nox-crete.com/#sle.
 - d. W.R. Meadows, Inc; Rezi-Weld Flex: www.wrmeadows.com/#sle.
 - e. Substitutions: See Section 016000 - Product Requirements.

2.05 ACCESSORIES

- A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.
1. Closed Cell and Bi-Cellular: 25 to 33 percent larger in diameter than joint width.
 2. Manufacturers:
 - a. ADFAST Corporation; ADSEAL BR-2600 (Backer Rod): www.adfastcorp.com/#sle.
 - b. Nomaco, Inc; HBR or SOF Rod: www.nomaco.com/#sle.
 - c. Substitutions: See Section 016000 - Product Requirements.
- B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.
- C. Masking Tape: Self-adhesive, nonabsorbent, non-staining, removable without adhesive residue, and compatible with surfaces adjacent to joints and sealants.
- D. Joint Cleaner: Non-corrosive and non-staining type, type recommended by sealant manufacturer; compatible with joint forming materials.

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

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrates and joints are ready to receive work.
- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

3.02 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.
- E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Perform acoustical sealant application work in accordance with ASTM C919.
- D. Measure joint dimensions and size joint backers to achieve the following, unless otherwise indicated:
 - 1. Width/depth ratio of 2:1.
 - 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.
- E. Install bond breaker backing tape where backer rod cannot be used.
- F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- G. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- H. Do not seal the following types of joints.
 - 1. Intentional weepholes in masonry.
 - 2. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
 - 3. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
 - 4. Joints where installation of sealant is specified in another section.
 - 5. Joints between suspended panel ceilings/grid and walls.
 - 6. Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
- I. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- J. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 CLEANING

- A. Clean adjacent soiled surfaces.

3.05 PROTECTION OF FINISHED WORK

- A. Protect sealants until cured.

3.06 POST-OCCUPANCY

- A. Post-Occupancy Inspection: Perform visual inspection of entire length of project sealant joints at a time that joints have opened to their greatest width; i.e. at low temperature in thermal cycle. Report failures immediately and repair.

END OF SECTION

SECTION 081113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Non-fire-rated hollow metal doors and frames.
- B. Hollow metal frames for wood doors.
- C. Accessories, including louvers.

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants.
- B. Section 087100 - Door Hardware.

1.03 DEFINITIONS

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

1.04 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100).
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
- I. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames.
- J. ICC A117.1 - Accessible and Usable Buildings and Facilities.
- K. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames.
- L. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames.
- M. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames.
- N. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames.
- O. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

- D. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.
- C. Store hollow metal work vertically under cover at Project site with head up. Place on minimum 4 inch high wood blocking. Provide minimum 1/4 inch space between each stacked door to permit air circulation.

1.08 WARRANTY

- A. Manufacturer warrants that products will be free from defects in material and workmanship for a period of 1 year from the date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Interior Hollow Metal Doors and Frames:
1. Ceco or Curries, an Assa Abloy Group company: www.assaabloydss.com.
 2. Pioneer Industries, Inc.
 3. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
 4. Steelcraft, an Allegion brand: www.allegion.com.
 5. Substitutions: See Section 016000 - Product Requirements.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 3. Door Top Closures: Flush end closure channel, with top and door faces aligned.
 4. Door Edge Profile: Manufacturers standard for application indicated.
 5. Typical Door Face Sheets: Flush. Smooth, seamless, joints mitered, interlocked, welded and ground smooth.
 6. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - a. Steel Door and Frame Reinforcing:
 - 1) Minimum 7 gauge steel of equivalent thread depth for hinges.
 - 2) Minimum 12 gauge steel for other hardware.
 7. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

- a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications but used where frames are grouted, and at least A60/ZF180 (galvannealed) for corrosive locations.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Interior Doors, Non-Fire Rated:
 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 1 - Full Flush.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
 2. Core Material: Vertical steel stiffeners, sound insulation core.
 3. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Factory primed and field finished.
- C. General:
 1. Comply with the requirements of grade specified for corresponding door.
 - a. ANSI A250.8 Level 3 door and Doors over 4'-0" wide: 14 gauge frames.
 - b. Other doors: 16 gauge.
 2. Face Width: 2 inches, unless otherwise indicated.
 3. Frame Depth: Coordinate to fit actual wall thicknesses, including masonry, plus 1/2-inch wrap each side.
 4. Frame Profile: Single rabbet, unless otherwise indicated. Double rabbet at exterior.
 5. Hospital / Terminated Stops: not required
 6. Knock-down frames are prohibited.
- D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
 1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
- E. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.
- F. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- G. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inch high to fill opening without cutting masonry units.
- H. Frames Wider than 48 inches: Reinforce with steel channel fitted tightly into frame head, flush with top.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

2.06 ACCESSORIES

- A. Frame Anchors:

1. Masonry Type: Adjustable strap and stirrup or T-shaped anchors to suit frame size, not less than 0.042 inches thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
- B. Louvers: Roll formed steel with overlapping frame; finish same as door components; factory-installed.
 1. Style: Sightproof inverted V blade.
 2. Fasteners: Exposed, tamper proof fasteners.
- C. Removable Stops: Formed sheet steel, rectangular, mitered corners; prepared for countersink style tamper proof screws.
- D. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- E. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
 1. Coordinate with painter so that silencers are not painted.
- F. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.
- G. Body Filler for repair of existing door frames: repair putty for filling dents and gouges in galvanized and non-galvanized hollow metal doors and frames; Bondo All-Purpose Putty by 3M or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of non-rated frames to be installed in concrete, masonry or to be grouted, with bituminous coating 1/16-inch thick, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- D. Install door hardware as specified in Section 087100.
 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- E. Comply with glazing installation requirements of Section 088000.
- F. Coordinate installation of electrical connections to electrical hardware items.
- G. Touch up damaged factory finishes.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

3.06 SCHEDULE

- A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 081416
FLUSH WOOD DOORS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Flush wood doors; flush configuration; non-rated.

1.02 RELATED REQUIREMENTS

- A. Section 081113 - Hollow Metal Doors and Frames.
- B. Section 087100 - Door Hardware.
- C. Section 081113 - Hollow Metal Doors and Frames: Metal door louvers.

1.03 REFERENCE STANDARDS

- A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards.
- B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.
- C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.
- D. Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.
- E. Samples: Submit two samples of door veneer, 6 by 6 inch in size illustrating wood grain, stain color, and sheen.
- F. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

- A. Maintain one copy of the specified door quality standard on site for review during installation and finishing.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years of documented experience.
- C. Installer Qualifications: Company specializing in performing work of the type specified in this section and approved by manufacturer.

1.06 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 if stored more than one week. Break seal on site to permit ventilation.

1.07 PROJECT CONDITIONS

- A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Interior Doors: Provide manufacturer's warranty for the life of the installation.
- C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Wood Veneer Faced Doors: Provide Basis of Design manufacturer listed, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty:
 - 1. Algoma Hardwoods: www.algomahardwoods.com
 - 2. Eggers Industries: www.eggersindustries.com.
 - 3. Graham Wood Doors: www.grahamdoors.com.
 - 4. Haley Brothers: www.haleybros.com.
 - 5. Marshfield Door Systems, Inc: www.marshfielddoors.com.
 - 6. **BASIS OF DESIGN:** VT Industries; "Heritage Collection", Model 5502H: www.vtindustries.com.
 - 7. Substitutions: See Section 016000 - Product Requirements.

2.02 DOORS

- A. Doors: Refer to drawings for locations and additional requirements.
 - 1. Quality Standard: Premium Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
 - 2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.
 - 3. No added urea-formaldehyde.
- 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 with factory transparent finish.

2.03 DOOR AND PANEL CORES

- A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated.
 - 1. Top Rail: 1-3/8" Structural Composite Lumber (SCL).
 - 2. Vertical Stiles: 1-3/8" SCL.
 - 3. Crossbands: High Density Fiber (HDF), no added urea-formaldehyde HDF or FSC certified.
 - 4. Faces: Wood veneer, as noted below, "A" Grade. Factory transparent finish.
 - 5. Bottom Rail: 1-3/8: SCL.

2.04 DOOR FACINGS

- A. Veneer Facing for Transparent Finish: White Maple, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, center balance match of spliced veneer leaves assembled on door or panel face.
 - 1. Vertical Edges: Same species as face veneer; lumber or veneer (ME), or compatible hardwood (CE), sanded ease; visible joints allowed on hinge edge.
 - 2. "Running Match" each pair of doors and doors in close proximity to each other.
- B. Facing Adhesive: Type I - waterproof.

2.05 DOOR CONSTRUCTION

- A. Fabricate doors in accordance with door quality standard specified.
- B. Cores Constructed with stiles and rails:
 - 1. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.
 - 2. Provide solid blocking for other through-bolted 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.
- E. Provide edge clearances in accordance with the quality standard specified.

2.06 FACTORY FINISHING - WOOD VENEER DOORS

- A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
 - 1. Transparent:
 - a. System - 11, Polyurethane, Catalyzed.
 - b. Stain: Custom, as selected by Architect.
 - c. Sheen: Satin.
- B. Factory finish doors in accordance with approved sample.
- C. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

- A. Hollow Metal Door Frames: As specified in Section 081113.
- B. Door Hardware: As specified in Section 087100.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and specified quality standard.
- B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.
- C. Use machine tools to cut or drill for hardware.
- D. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

- A. Comply with specified quality standard for fit and clearance tolerances.
- B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

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

3.05 SCHEDULE - SEE DRAWINGS

END OF SECTION

SECTION 087100 – DOOR HARDWARE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 08 Section "Hollow Metal Doors and Frames".
 - 2. Division 08 Section "Flush Wood Doors".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.3 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- D. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.

1.4 QUALITY ASSURANCE

- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

- B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- D. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
- E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.
- F. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:
 - 1. Function of building, purpose of each area and degree of security required.
 - 2. Plans for existing and future key system expansion.
 - 3. Requirements for key control storage and software.
 - 4. Installation of permanent keys, cylinder cores and software.
 - 5. Address and requirements for delivery of keys.
- G. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.
 - 1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
 - 2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
 - 3. Review sequence of operation narratives for each unique access controlled opening.
 - 4. Review and finalize construction schedule and verify availability of materials.
 - 5. Review the required inspecting, testing, commissioning, and demonstration procedures
- H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
- B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.
- C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.
- B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

- A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of the hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 4. Electrical component defects and failures within the systems operation.
- C. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
 - 1. Seven years for heavy duty cylindrical (bored) locks and latches.
 - 2. Twenty five years for manual surface door closer bodies.

1.8 MAINTENANCE SERVICE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

- A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:
 - 1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
- C. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'0": 4-1/2" standard or heavy weight as specified.
 - b. Sizes from 3'1" to 4'0": 5" standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.

- b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
4. Hinge Options: Comply with the following:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
5. Manufacturers:
 - a. Stanley Hardware (ST) - CB Series.

2.3 DOOR OPERATING TRIM

- A. Door Push Plates and Pulls: ANSI/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 2. Manufacturers:
 - a. Burns Manufacturing (BU).

2.4 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
 1. Manufacturers:
 - a. Schlage (SC).
 - b. No Substitution.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.
 4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 5. Keyway: Match Facility Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed.
 1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.

2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Key locks to Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.5 MECHANICAL LOCKS AND LATCHING DEVICES

A. Cylindrical Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.2, Series 4000, Grade 1 certified.

1. Furnish with solid cast levers, standard 2 3/4" backset, and 1/2" (3/4" at rated paired openings) throw brass or stainless steel latchbolt.
2. Locks are to be non-handed and fully field reversible.
3. Extended cycle test: Locks to have been cycle tested in ordinance with ANSI/BHMA 156.2 requirements to 2 million cycles.
4. Manufacturers:
 - a. Schlage (SC) – ND Series.
 - b. No Substitution.

2.6 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.7 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
7. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Manufacturers:
 - a. LCN Closers (LC) - 4040XP Series.
 - b. No Substitution.

2.8 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1" LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16" above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer's catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 certified protection plates (kick, armor, or mop), fabricated from the following:
 - a. Stainless Steel: 300 grade, 050-inch thick.
5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.9 DOOR STOPS AND HOLDERS

- A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.
- B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.
 1. Manufacturers:
 - a. Rockwood Products; ASSA ABLOY Architectural Door Accessories (RO).

2.10 FABRICATION

- A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.11 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

- A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9

Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

- D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."
- E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

- A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating and adjusted.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

- A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.
- B. Clean adjacent surfaces soiled by door hardware installation.
- C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

- A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

- A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

B. The supplier is responsible for handing and sizing all products and providing the correct option for the appropriate door type and material where more than one is presented in the hardware sets. Quantities listed are for each pair of doors, or for each single door.

C. Manufacturer's Abbreviations:

1. ST - Stanley Works
2. ST - dormakaba Door Closers
3. ST - dormakaba Hinges
4. SC - Schlage
5. BU - Burns Manufacturing Inc
6. LC - LCN Closers
7. RO - Rockwood

Hardware Sets

Set: 1.0

Doors: 203A, 208A, 213A

3 Hinge	FBB179 4-1/2" x 4-1/2"	US26D	ST
4 Hinge	FBB199 4-1/2" x 4-1/2" (@ DR 213A)	US26D	ST
1 Door Closer	4040XP Rw/PA	AL	LC
1 Kick Plate	K1050 10" x 34" CSK BEV	US32D	RO
1 Kick Plate	K1050 10" x 52" CSK BEV (@ DR 213A)	US32D	RO

Set: 2.0

Doors: 206A, 211A

3 Hinge	FBB179 4-1/2" x 4-1/2"	US26D	ST
1 Push Plate	54	US32D	BU
1 Pull Plate	5426C	US32D	BU
1 Door Closer	4040XP Rw/PA	AL	LC
1 Kick Plate	K1050 10" x 34" CSK BEV	US32D	RO
1 Wall Stop	409	US32D	RO

Set: 3.0

Doors: 101A

3 Hinge	FBB179 4-1/2" x 4-1/2"	US26D	ST
1 Faculty Restroom Lock	ND85 P D RHO	626	SC

1 Door Closer

4040XP Rw/PA

AL

LC

1 Wall Stop

409

US32D

RO

END OF SECTION 087100

SECTION 089100

LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Louvers, frames, and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 042000 - Unit Masonry: Prepared wall opening.
- B. Section 079200 - Joint Sealants: Sealing joints between frames and adjacent construction.

1.03 REFERENCE STANDARDS

- A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix).

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.
- C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available finishes, colors, and textures.
- E. Test Reports: Independent agency reports showing compliance with specified performance criteria.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum ten years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of type specified and with at least three years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Comply with manufacturer's instructions for handling of grille and screen products.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Provide five year manufacturer's warranty against distortion, metal degradation, and connection failures of louver components.
 - 1. Finish: Include twenty year coverage against degradation of exterior finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Louvers:
 - 1. Airolite Company, LLC: www.airolite.com.
 - 2. Architectural Louvers: www.archlouvers.com
 - 3. Construction Specialties, Inc: www.c-sgroup.com.
 - 4. Greenheck Fan Corporation
 - 5. Industrial Louvers, Inc: www.industriallouvers.com.
 - 6. InPro Corporation: www.inprocorp.com.
 - 7. Ruskin Company; www.ruskin.com

8. United Enertech; www.unitedenertech.com
9. Substitutions: See Section 016000 - Product Requirements.

2.02 LOUVERS

- A. Stationary Louvers at interior masonry wall: Horizontal blade, extruded aluminum construction.
 1. Free Area: 50 percent, minimum.
 2. Blades: V-shaped, sight-proof.
 3. Frame: 4 inches deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
 4. Aluminum Thickness: Frame 12 gage, 0.0808 inch minimum; blades 12 gage, 0.0808 inch minimum.
 5. Aluminum Finish: Superior performing organic coatings; finished after fabrication.

2.03 MATERIALS

- A. Extruded Aluminum: ASTM B221 (ASTM B221M).

2.04 FINISHES

- A. Superior Performing Organic Coatings System: Polyvinylidene fluoride (PVDF) multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent PVDF resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch.
- B. Color: As selected from manufacturer's standard colors.

2.05 ACCESSORIES

- A. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.
- B. Fasteners and Anchors: Stainless steel.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that prepared openings are ready to receive this work and opening dimensions are as indicated on shop drawings.
- B. Verify that field measurements are as indicated on shop drawings.
- C. If substrate preparation is the responsibility of another installer, notify General Contractor of unsatisfactory preparation before proceeding.

3.02 INSTALLATION

- A. Install louver assembly in accordance with manufacturer's instructions.
- B. Install louvers level and plumb.
- C. Secure louver frames in openings with concealed fasteners.
- D. Coordinate with installation of mechanical ductwork.

3.03 CLEANING

- A. Strip protective finish coverings.
- B. Clean surfaces and components.

3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Protect metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces that will be in contact with concrete, masonry or dissimilar metals.

END OF SECTION

SECTION 090561**COMMON WORK RESULTS FOR FLOORING PREPARATION****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. This section applies to floors identified in Contract Documents that are receiving the following types of floor coverings:
 - 1. Carpet tile.
 - 2. Thin-set ceramic tile.
- B. Removal of existing floor coverings.
- C. Preparation of new concrete floor slabs for installation of floor coverings.
- D. Testing of concrete floor slabs for moisture and alkalinity (pH).
- E. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
 - 1. Contractor shall perform all specified remediation of concrete floor slabs. If such remediation is indicated by testing agency's report and is due to a condition not under Contractor's control or could not have been predicted by examination prior to entering into the contract, a contract modification will be issued.
- F. Remedial floor coatings.

1.02 RELATED REQUIREMENTS

- A. Section 014000 - Quality Requirements: Additional requirements relating to testing agencies and testing.
- B. Section 033000 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 DEFINITIONS

- A. MVE: Moisture Vapor Emission.
- B. MVER: Moisture Vapor Emission Rate; measured in lbs per1000 ft2 / 24 hours.
- C. RH: Relative Humidity; measured in percentage.
- D. VOC: Volatile Organic Compound; measured in grams/liter.
- E. CSP: Concrete Surface Profile defined by ICRI.

1.04 REFERENCE STANDARDS

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- D. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute.

1.05 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.
- B. Pre-Installation Meeting:
 - 1. Convene minimum two weeks prior to starting work of this section.
 - 2. Discuss contract document requirements, moisture tests, manufacturer recommendations, installer's recommendations, scheduling, and protection of work from damage by other trades.
 - 3. Attendance required by: Contractor, Floor Installer, Manufacturer's Representative, Independent testing agency, Concrete Subcontractor, Ready Mix supplier.
 - 4. Objective of conference is:

- a. Review methods and procedures.
 - b. Tour job site representative areas to inspect and discuss condition of substrate.
 - c. Review concrete finishing requirements.
 - d. Review and finalize construction schedule to ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
 - e. Review required inspections, testing, certifications, material usage procedures.
 - f. Review environmental restrictions and forecasts.
 - g. Confirm compatibility of MVE control coatings with other concrete chemicals specified.
 - h. Record content of conference including attendance and topics.
5. Furnish record of pre-installation conference to all parties who are affected by MVE control systems work.

1.06 SUBMITTALS

- A. Visual Observation Report: For existing floor coverings to be removed.
- B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
 1. Moisture and alkalinity (pH) limits and test methods.
 2. Manufacturer's required bond/compatibility test procedure.
- C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
 1. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
 2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
 3. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.
- D. Testing Agency's Report:
 1. Description of areas tested; include floor plans and photographs if helpful.
 2. Summary of conditions encountered.
 3. Moisture and alkalinity (pH) test reports.
 4. Copies of specified test methods.
 5. Recommendations for remediation of unsatisfactory surfaces.
 6. Product data for recommended remedial coating.
 7. Submit report to Architect.
 8. Submit report not more than two business days after conclusion of testing.
- E. Adhesive Bond and Compatibility Test Report.
- F. Installer's Qualification Statement.

1.07 QUALITY ASSURANCE

- A. Supply all components of MVE Control System from single source manufacturer.
- B. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.
- C. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.
- D. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
 1. Submit evidence of experience consisting of at least 3 test reports of the type required, with project Owner's project contact information.
- E. Contractor's Responsibility Relating to Independent Agency Testing:
 1. Provide access for and cooperate with testing agency.
 2. Confirm date of start of testing at least 10 days prior to actual start.
 3. Allow at least 4 business days on site for testing agency activities.

4. Achieve and maintain specified ambient conditions.
 5. Notify Architect when specified ambient conditions have been achieved and when testing will start.
- F. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.
- B. Deliver materials in manufacturer's packaging; include installation instructions.
- C. Keep materials from freezing.

1.09 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F or more than 85 degrees F.
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.
- B. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.
 1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
 2. ASTM F3010 qualified, fluid-applied, two-component, 100 percent solids epoxy resin, low viscosity, penetrating, one-coat membrane forming system; formulated for application on concrete substrates to reduce MVER to level required for installation of floor covering indicated, including adhesives.
 3. Products:
 - a. Allied Construction Technologies, Inc. (ACTech), GoEarly Technology; www.actechperforms.com
 - b. ARDEX Engineered Cements; ARDEX MC RAPID: www.ardexamericas.com/#sle.
 - c. Custom Building Products; TechMVC Moisture Vapor and Alkalinity Barrier: www.custombuildingproducts.com/#sle.
 - d. ISE Logik: MVEC 700; www.iselogik.com
 - e. Koster American Corporation; Koster VAP 1 2000: www.kosterusa.com.
 - f. LATICRETE International, Inc; LATICRETE NXT Vapor Reduction Coating with LATICRETE NXT Level Plus: www.laticrete.com/#sle.
 - g. MAPEI Americas: Planiseal VS or VS Fast; www.mapei.com/US-EN
 - h. Maxxon Corporation: MVP; www.maxxoncorporation.com
 - i. TEC, an H.B. Fuller Construction Products Brand; TEC LiquiDam with TEC Level Set 200 SLU: www.tecspecialty.com/#sle.
 - j. Tnemec Company, Inc; Series 208 Epoxoprime MVT: www.tnemec.com/#sle.
 - k. UZIN, a division of UFLOOR Systems Inc; UZIN PE 460 with UZIN PE 280 and UZIN NC 170 LevelStar: www.ufloorsystems.com/#sle.
 - l. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION**3.01 CONCRETE SLAB PREPARATION**

- A. Perform following operations in the order indicated:
 - 1. Existing concrete slabs (on-grade and elevated) with existing floor coverings:
 - a. Visual observation of existing floor covering, for adhesion, water damage, alkaline deposits, and other defects.
 - b. Removal of existing floor covering.
 - 2. Existing concrete slabs with coatings or penetrating sealers/hardeners/dustproofers:
 - a. Do not attempt to remove coating or penetrating material.
 - b. Do not abrade surface.
 - 3. Preliminary cleaning.
 - 4. Moisture vapor emission tests; 3 tests in the first 1000 square feet and one test in each additional 1000 square feet, unless otherwise indicated or required by flooring manufacturer.
 - 5. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 6. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
 - 7. Specified remediation, if required.
 - 8. Patching, smoothing, and leveling, as required.
 - 9. Other preparation specified.
 - 10. Adhesive bond and compatibility test.
 - 11. Protection.
- B. Remediations:
 - 1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
 - 2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
 - 3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

- C. Test in accordance with ASTM F1869 and as follows.
- D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.
- F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.
- C. Test in accordance with ASTM F2170 Procedure A and as follows.
- D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.
- E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.
- F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

- A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.
- B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.
 - 1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.
 - 2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
 - 3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.
- C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

- A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.

3.10 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.

END OF SECTION

SECTION 092116
GYPSON BOARD ASSEMBLIES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Metal channel ceiling framing.
- D. Gypsum wallboard.
- E. Joint treatment and accessories.
- F. Textured finish system.
- G. Painting of above-ceiling firewall warning signs required by code.

1.02 RELATED REQUIREMENTS

- A. Section 015000 - Construction Facilities and Temporary Controls: temporary partition requirements
- B. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.
- C. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

- A. AISI S100-12 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute.
- B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- C. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
- D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
- E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
- F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
- G. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness.
- H. 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.
- I. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base.
- J. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
- K. GA-216 - Application and Finishing of Gypsum Board.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing gypsum board installation and finishing.
- B. Perform in accordance with ASTM C 840. Comply with requirements of GA-600 for fire-rated assemblies.

PART 2 PRODUCTS**2.01 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 METAL FRAMING MATERIALS

- A. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. CEMCO Steel.
 - 2. Clarkwestern Dietrich Building Systems LLC: www.clarkdietrich.com.
 - 3. Contractor Steel Systems, Inc.
 - 4. Custom Stud.
 - 5. Marino: www.marinoware.com.
 - 6. Phillips Manufacturing Co: www.phillipsmfg.com/#sle.
 - 7. SCAFCO Corporation: www.scafco.com/#sle.
 - 8. The Steel Network, Inc: www.SteelNetwork.com.
 - 9. PAC International, Inc. www.pac-intl.com.
 - 10. USG Corporation.
 - 11. Substitutions: See Section 016000 - Product Requirements.
- B. Non-structural Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
 - 1. Contractor to confirm any gages or spacings indicated in wall types and modify as required to meet standards.
 - 2. Studs: "C" shaped with flat or formed webs with knurled faces.
 - a. 25 gauge for soffits and bulkheads.
 - 3. Runners: U shaped, sized to match studs.
 - 4. Ceiling Channels: C-shaped.
- C. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
 - 1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100-12.
 - 2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
 - 3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems of fire rating and movement required.
- D. Non-structural Framing Accessories:
 - 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. CertainTeed Corporation: www.certainteed.com.
 - 2. Georgia-Pacific Gypsum: www.gpgypsum.com.
 - 3. National Gypsum Company: www.nationalgypsum.com.
 - 4. USG Corporation: www.usg.com.
 - 5. Substitutions: See Section 016000 - 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. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
3. Thickness:
 - a. Vertical Surfaces: 5/8 inch.
 - b. Ceilings: 5/8 inch.
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

2.04 GYPSUM WALLBOARD ACCESSORIES

- A. Acoustic Sealant: Acrylic emulsion latex or water-based elastomeric sealant; do not use solvent-based non-curing butyl sealant.
- B. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless noted otherwise.
 1. Types: As detailed or required for finished appearance.
 2. Special Shapes: In addition to conventional corner bead and control joints, provide U-bead at exposed panel edges.
 3. Products:
 - a. Same manufacturer as framing materials.
- C. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
 1. Paper Tape: 2 inch wide, creased paper tape for joints and corners at paper-faced gypsum.
 2. Joint Compound: Drying type, vinyl-based, ready-mixed.
- D. Textured Finish Materials: Latex-based compound; plain.
 1. Products:
 - a. CertainTeed Corporation; ProRoc Easi-Tex Spray Texture: www.certainteed.com/#sle.
 - b. National Gypsum Co.; Perfect Spray EM Texture.
 - c. USG Corp.; Beadex FasTex Wall & Ceiling Spray Texture.
 - d. Substitutions: See Section 016000 - Product Requirements.
- E. 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.
- F. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Verify that rough-in utilities are in proper location.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as permitted by standard unless noted more restrictively on drawings.
 1. Level ceiling system to a tolerance of 1/1200.
 2. Laterally brace entire suspension system.
- C. Blocking: Install wood blocking or mechanically fastened steel sheet blocking for support of:
 1. Framed openings.
 2. Toilet partitions.

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.
- C. Installation on Metal Framing: Use screws for attachment of gypsum board.

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. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.
- B. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 4: Walls and ceilings to receive other paint finishes, unless otherwise indicated.
 - 2. Level 3: Walls to receive textured wall finish.
 - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 - 4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
 - 5. Level 0: Temporary partitions.
- C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 - 2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
 - 3. Taping, filling and sanding is not required at base layer of double layer applications.
- D. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.06 TEXTURE FINISH

- A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.
- B. Texture Required: Medium Orange Peel.

3.07 FIRE WALL MARKING

- A. Refer to Code Analysis Plans and to Reflected Ceiling Plans. At all fire-rated or smoke-partition walls that are located adjacent to accessible (acoustical) ceiling tiles or an accessible attic/ceiling space, provide permanent stenciling indicating hourly rating.
 - 1. Lettering shall be a minimum 3-inch high with 3/8-inch minimum stroke in a contrasting color incorporated the suggested wording, "FIRE AND/OR SMOKE BARRIER - PROTECT ALL OPENINGS" or similar wording.
 - 2. Markings shall be located within 15 feet of the end of each wall and at intervals not exceeding 30 feet, measure horizontally along the wall or partition.
 - 3. Markings shall be on both sides of all rated partitions and in every adjacent room.

3.08 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 093000**TILING****PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Tile for floor applications (CT-#)
- B. Tile for wall and base applications (CT-#)
- C. Setting bed and grout (GT-#)
- D. Non-ceramic trim.
- E. Accessories

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealing joints between tile work and adjacent construction and fixtures.
- B. Section 102800 - Toilet, Bath, and Laundry Accessories; coordination
- C. Section 224000 - Plumbing Fixtures: wall-mounted sinks and toilets

1.03 REFERENCE STANDARDS

- A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar.
- B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar.
- C. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement.
- D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive.
- E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
- F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy.
- G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout.
- H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout.
- I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework.
- J. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar.
- K. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone.
- L. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive.
- M. ANSI A137.1 - American National Standard Specifications for Ceramic Tile.
- N. ASTM C373 - Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic Tiles and Non-tile Fired Ceramic Whiteware Products.
- O. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- P. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

- Q. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- R. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation.

1.04 DEFINITIONS

- A. Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.
- C. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, setting details, and transition devices.
 - 1. Submit for each room (floor and/or walls), after field-verification to reflect actual conditions.
- D. Samples: Mount tile and apply grout on two plywood panels, minimum 18 by 18 inches in size illustrating pattern, color variations, and grout joint size variations.
- E. Maintenance Data: Include recommended cleaning methods, cleaning materials, and stain removal methods.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Tile: 5 percent of each size, color, and surface finish combination, but not less than one carton of each type.
 - 3. Extra Grout: Furnish quantity equal to 5 percent of each type and color installed.
 - 4. Turn over to owner, for storage on-site or off-site.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, with minimum five years of documented experience.
- B. Installer Qualifications:
 - 1. Installer Certification:
 - a. Ceramic Tile Education Foundation (CTEF): Certified Tile Installer (CTI).

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs of edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.
- D. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 FIELD CONDITIONS

- A. Do not install solvent-based products in an unventilated environment.
- B. Maintain ambient and substrate temperature above 50 degrees F and below 100 degrees F during installation and curing of setting materials.

PART 2 PRODUCTS

2.01 TILE

- A. Manufacturers: Provide Basis of Design manufacturer listed in the Interior Finish Schedule, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty.
- B. Manufacturers:

1. American Olean Corporation: www.americanolean.com/#sle.
 2. **BASIS OF DESIGN:** Dal-Tile Corporation: www.daltile.com/#sle.
 3. Crossville Tile; www.crossvilleinc.com
 4. Substitutions: See Section 016000 - Product Requirements.
- C. Glazed Wall Tile (CT-2): ANSI A137.1, standard grade.
1. Water Absorption (ASTM C 373): 200%.
 2. Breaking Strength (ASTM C 648): 120-230 lbs.
 3. Chemical Resistance (ASTM C 650): Resistant.
 4. MOHS Scratch Hardness: 4.0-6.0.
 5. Size: 4-1/4 x 4-1/4 x 5/16 inch, nominal.
 6. Color(s): 0790, Matte Arctic White.
 7. Trim Units: Matching cove base (A-3361) shapes in 3 x 6 inch size.
 8. Products:
 - a. Dal-Tile Corporation; Glazed Ceramic Tile: www.daltile.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- D. Porcelain Tile (CT-1): ANSI A137.1, standard grade.
1. Moisture Absorption: 0 to 0.5 percent as tested in accordance with ASTM C373.
 2. Breaking Strength (ASTM C 648): >300 lbs.
 3. Chemical Resistance: (ASTM C 650): Resistant.
 4. MOHS Scratch Hardness: 6.0-7.5.
 5. Size: 24 x 24 x 1/4 inch, nominal.
 6. Mounting: Dot mounted on 12" x 24" sheet.
 7. Color(s): Keystone, D208 Suede Gray Speckle.
 8. Products:
 - a. Dal-Tile Corporation; Colorbody Porcelain Tile: www.daltile.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.02 TRIM AND ACCESSORIES

- A. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
1. Applications:
 - a. Open edges of wall tile.
 - b. Open edges of floor tile.
 - c. Wall corners, outside and inside.
 2. Manufacturers:
 - a. **BASIS OF DESIGN:** Schluter-Systems: www.schluter.com.
 - b. Substitutions: See Section 016000 - Product Requirements.
 3. Products:
 - a. Edge-Protection and Transition Profiles for Floors: L-shaped profile with 1/8 inch wide visible surface, integrated trapezoid-perforated anchoring leg, and an 87° sloped vertical wall section that provides a decorative finish and protects adjacent tiles; Schluter-JOLLY or SCHIENE.

2.03 SETTING MATERIALS

- A. Provide setting and grout materials from same manufacturer.
- B. Polymer-Modified, High-Performance Full-Contact Mortar: meets or exceeds ANSI A118.4 and A118.11 bond strength requirements.
1. Applications: Use this type of grout at all locations, including large format tiles.
 2. Physical Properties:
 - a. Compressive Strength at 28 Days: 3,000 psi.
 - b. 28 Days Shear Strength:
 - 1) Pocerlain tile: 400 psi.
 - 2) Glazed Wall Tile: 443 psi.
 - 3) Pot Life at 70 degrees F: 1 to 2 hours.

- 4) Final Set at 70 degrees F: 12 hours.
3. Products:
 - a. **BASIS OF DESIGN:** Bostik, Inc.; Hydroment PM Polymer Modified Thin-Set Mortar.
 - b. Substitutions: See Section 01 60 00 - Product Requirements.

2.04 GROUTS

- A. Epoxy Grout (GT-#): ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
 1. Applications: all tiles area.
 2. Physical Properties:
 - a. Compressive Strength: >5,000 psi.
 - b. 7 Days Shear Bond Strength:
 - 1) Ceramic Mosaic tile: 1000 psi.
 - 2) Glazed Wall Tile: Exceeds tile breakage.
 - c. Water Absorption: 0%.
 - d. Pot Life at 70 degrees F: 45 minutes.
 - e. Workability at 73 degrees F: 90 minutes minimum.
 - f. Water Cleanability at 73 degrees F: >90 minutes.
 - g. Cure Time at 73 degrees F: 16 to 24 hours.
 3. Color(s): G93632 Char Black.
 4. Products:
 - a. **BASIS OF DESIGN:** Bostik, Inc.; EzPoxy EZClean Two-Component, 100% Solids.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.05 MAINTENANCE MATERIALS

- A. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
 1. Composition: Water-based colorless silicone.
 2. Products:
 - a. Merkrete, by Parex USA, Inc; Merkrete Grout Sealer: www.merkrete.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.
- B. Grout Release: Temporary, water-soluble pre-grout coating.
 1. Products:
 - a. Custom Building Products; Aqua Mix Grout Release: www.custombuildingproducts.com/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.
- 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 tile.
- C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 2. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.
- D. Prepare substrate surfaces for adhesive installation in accordance with adhesive manufacturer's instructions.

3.03 INSTALLATION - GENERAL

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.
- D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.
- E. Form internal angles square and external angles bullnosed.
- F. Install non-ceramic trim in accordance with manufacturer's instructions.
- G. Sound tile after setting. Replace hollow sounding units.
- H. Keep control and expansion joints free of mortar, grout, and adhesive.
- I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.
- J. Grout tile joints unless otherwise indicated.
- K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

- A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with epoxy grout, unless otherwise indicated.
 - 1. Where epoxy bond coat and grout are indicated, install in accordance with TCNA (HB) Method F131.
 - 2. Where epoxy or furan grout is indicated, but not epoxy or furan bond coat, install in accordance with TCNA (HB) Method F115.

3.05 INSTALLATION - WALL TILE

- A. Over interior concrete and masonry install in accordance with TCNA (HB) Method W202, thin-set with dry-set or latex-Portland cement bond coat.

3.06 CLEANING

- A. Clean tile and grout surfaces.

3.07 PROTECTION

- A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 095100
ACOUSTICAL CEILINGS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Suspended metal grid ceiling system.
- B. Acoustical units (ATC-#).

1.02 RELATED REQUIREMENTS

- A. Section 211300 - Fire-Suppression Sprinkler Systems: Sprinkler heads in ceiling system.
- B. Section 233700 - Air Outlets and Inlets: Air diffusion devices in ceiling.
- C. Section 265100 - Interior Lighting: Light fixtures in ceiling system.
- D. Section 284600 - Fire Detection and Alarm: Fire alarm components in ceiling system.

1.03 REFERENCE STANDARDS

- A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
- C. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
- D. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions.
- E. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.

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 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on suspension system components and acoustical units.
- C. Samples: Submit two samples 6 by 6 inch in size illustrating material and finish of wood acoustical units only.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.
 - 3. Extra Suspension System Components: Quantity of each exposed component equal to 2 percent of quantity installed.
 - 4. Turn over to owner, for storage on-site or off-site.

1.06 QUALITY ASSURANCE

- A. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum five years documented experience.
- B. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years experience.

1.07 FIELD CONDITIONS

- A. Do not install ceilings until space is enclosed and weatherproof; wet work in place is completed and normally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy.

- B. Building areas to receive ceilings shall be free of construction dust and debris.
- C. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.08 DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.09 WARRANTY

- A. Submit a written warranty executed by the manufacturer, agreeing to repair or replace panels that fail within the warranty period. Failures include, but are not limited to the following:
 - 1. Acoustical Panels: Sagging and warping.
 - 2. Grid System: Rusting and manufacturer's defects.
- B. Warranty Period:
 - 1. Acoustical Panels: Ten (10) years from Date of Substantial Completion.
 - 2. Suspension System: Ten (10) years from Date of Substantial Completion.
 - 3. Ceiling System: Thirty (30) years from Date of Substantial Completion

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide Basis of Design manufacturer listed, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty.
- B. Acoustic Tiles/Panels:
 - 1. Armstrong World Industries, Inc: www.armstrong.com.
 - 2. CertainTeed Corporation: www.certainteed.com.
 - 3. **BASIS OF DESIGN:** USG: www.usg.com.
 - 4. Substitutions: See Section 016000 - Product Requirements.
- C. Suspension Systems:
 - 1. Same as for acoustical units.
 - 2. Substitutions: See Section 016000 - Product Requirements.

2.02 ACOUSTICAL UNITS

- A. Acoustical Units - General: ASTM E1264, Class A.
- B. Acoustical Tiles: Painted mineral fiber, with the following characteristics:
 - 1. Classification: ASTM E1264 Type III.
 - a. Form: 2, water felted.
 - b. Pattern: "C" - perforated, small holes.
 - 2. Size: 24 by 24 inches.
 - 3. Thickness: 5/8 inches.
 - 4. Light Reflectance: 84 percent, determined in accordance with ASTM E1264.
 - 5. NRC Range: 0.55 to 0.60, determined in accordance with ASTM E1264.
 - 6. Ceiling Attenuation Class (CAC): 33, determined in accordance with ASTM E1264.
 - 7. Tile Edge: Square.
 - 8. Color: White.
 - 9. Suspension System: Concealed.
 - 10. Products:
 - a. **BASIS OF DESIGN:** USG Corporation; Radar Acoustical Panels (#2210): www.usg.com/ceilings/#sle.

- b. Substitutions: See Section 016000 - Product Requirements.

2.03 SUSPENSION SYSTEM(S)

- A. 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.
 - 1. Size attachment devices for five times the design load indicated in ASTM C 635/C 635M, Table 1, "direct Hung".
 - 2. Materials:
 - a. Steel Grid: ASTM A653/A653M, G30 coating, unless otherwise indicated.
- B. Exposed Suspension System: Hot-dipped galvanized steel grid and cap.
 - 1. Structural Classification: Intermediate-duty, when tested in accordance with ASTM C635/C635M.
 - 2. Profile: Tee; 15/16 inch face width.
 - 3. Finish: Baked enamel.
 - 4. Color: White
 - 5. Products:
 - a. **BASIS OF DESIGN:** USG Corporation; Donn Brand DX/DXL 15/16 inch Acoustical Suspension System: www.usg.com/ceilings/#sle.
 - b. Substitutions: See Section 016000 - Product Requirements.

2.04 ACCESSORIES

- A. Support Channels and Hangers: Galvanized steel; size and type to suit application and ceiling system flatness requirement specified.
- B. Hanger Wire: 12-gage 0.08 inch galvanized steel wire.
- C. Perimeter Moldings: Same metal and finish as grid.
 - 1. Size: As required for installation conditions.
 - 2. Angle Molding: L-shaped, for mounting at same elevation as face of grid.
- D. Corner Caps: Provide outside corner caps to match exposed grid.
- E. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

- A. Install suspension system in accordance with ASTM C636/C636M, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section.
- B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.
- C. Locate system on room axis according to reflected plan.
- D. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
 - 1. Use longest practical lengths.
 - 2. Install outside corner caps.
- E. Suspension System, Non-Seismic: 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.
- F. 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.

- G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.
- H. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.
- I. Do not eccentrically load system or induce rotation of runners.
- J. Form expansion joints as detailed. Form to accommodate plus or minus 2 inch movement. Maintain visual closure.

3.03 INSTALLATION - ACOUSTICAL UNITS

- A. Install acoustical units in accordance with manufacturer's instructions.
- B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.
- C. Fit border trim neatly against abutting surfaces.
- D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.
- E. Cutting Acoustical Units:
 - 1. Make field cut edges of same profile as factory edges.
 - 2. Double cut and field paint exposed reveal edges.

3.04 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.

3.05 ADJUSTING AND CLEANING

- A. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up minor finish damage.
- B. Remove any ceiling products that cannot be successfully cleaned or repaired. Replace with new product to eliminate evidence of damage.

END OF SECTION

SECTION 096500
RESILIENT FLOORING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Resilient base (RB-#).
- B. Installation accessories.

1.02 RELATED REQUIREMENTS

- A. Section 033000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied resilient flooring.
- B. Section 090561 - Common Work Results for Flooring Preparation: Removal of existing floor coverings, cleaning, and preparation.
- C. Section 090561 - Common Work Results for Flooring Preparation: Concrete slab moisture and alkalinity testing and remediation procedures.
- D. Section 093000 - Tiling; transitions associated with tile flooring.
- E. Section 096813 - Tile Carpeting; flooring requiring resilient base

1.03 REFERENCE STANDARDS

- A. ASTM F1861 - Standard Specification for Resilient Wall Base.

1.04 SUBMITTALS

- A. See Section 013000 - 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 016000 - Product Requirements, for additional provisions.
 - 2. Extra Wall Base: 50 linear feet of each type and color.
 - 3. Turn over to owner, for storage on-site or off-site.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum ten years documented experience.
- B. Installer Qualifications: Company specializing in installing specified flooring and approved by flooring manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.
- B. Store all materials off of the floor in an acclimatized, weather-tight space.
- C. Maintain temperature in storage area between 50 degrees F and 90 degrees F.
- D. Protect roll materials from damage by storing on end.
- E. Do not double stack pallets.

1.07 FIELD CONDITIONS

- A. 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.
- B. Maintain the relative humidity between 40% and 60% during installation.

- C. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 degrees F or more than 85 degrees F , in spaces to receive resilient sheet flooring for at least 48 hours prior to, during and 48 hours after the application of the flooring is required.

1.08 WARRANTY

- A. Wear: five years

PART 2 PRODUCTS

2.01 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TP, rubber, thermoplastic; top set as indicated below.
 - 1. Manufacturers:
 - a. Armstrong World Industries, Inc.
 - b. Burke Flooring: www.burkeflooring.com/#sle.
 - c. Johnsonite, a Tarkett Company: www.johnsonite.com.
 - d. Mannington Commercial Flooring;
 - e. Roppe Corp: www.roppe.com.
 - f. Substitutions: See Section 016000 - Product Requirements.
 - 2. Height: 4 inch.
 - 3. Thickness: 0.125 inch.
 - 4. Top Set Style:
 - a. RB-1: Style B Coved; locations as indicated in Interior Finish Schedule
 - 5. Finish: Matte.
 - 6. Length: Roll.
 - 7. Outside and Inside Corners: Job formed.
 - 8. Color: To be selected by Architect from manufacturer's full range.

2.02 ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modofied, portland cement based or blended hydraulic-cement based formulation provided by or approved by manufacturer for applications indicated.
- B. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by manufacturer for substrates required (including cmu).
- C. Moldings, Transition and Edge Strips: same material as flooring. Configurations as indicated in the drawings, and to suit conditions.
 - 1. Colors: as indicated in Finish Schedule or as selected by Architect from manufacturer's full range.

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.
 - 1. The surface shall be free from any paint, wax, oil, grease, and film forming curing compounds, silicate penetrating curing compounds, sealing, hardening or parting compounds. The surface should not have any alkaline salts, laitance, mold, mildew, residual adhesive, chemical adhesive removers or anything that may prevent appropriate products bonding to it.
 - 2. If not sufficiently clean, then the contractor shall provide mechanical means to remove them, such as a dustless diamond grinding, bead-blast or similar with a suitable Hepa vacuum attachment. Review and comply with all relevant local, state and federal regulations.
- 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.

- C. Cementitious Subfloor Surfaces: Verify that substrates are ready for resilient flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test in accordance with Section 090561.
 - 2. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
 - 3. Follow moisture and alkalinity remediation procedures in Section 090561.

3.02 PREPARATION

- A. Flooring installation should not begin until all site conditions have been assessed, testing has been completed and subfloor conditions have been approved.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove subfloor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with subfloor filler to achieve smooth, flat, hard surface.
- D. Prohibit traffic until filler is fully cured.
- E. Vacuum and clean substrate. If required, only use water based sweeping compounds. Do not use any wax or oil based compounds that leave behind a residue that may interfere with the adhesive bond.
- F. Apply primer as required to prevent "bleed-through" or interference with adhesion by substances that cannot be removed.
- G. Perform mat bond tests in each major area (1 per ~1,000 sq. ft.) consisting of the proposed subfloor preparation, mitigation and leveling or smoothing products. Do not proceed with installation until all the results of the bond test are acceptable.

3.03 INSTALLATION - GENERAL

- A. Starting installation constitutes acceptance of sub-floor and wall conditions.
- B. Install in accordance with manufacturer's written instructions for substrates encountered.
- C. Adhesive-Applied Installation:
 - 1. Spread only enough adhesive to permit installation of materials before initial set.
 - 2. Fit joints and butt seams tightly.
 - 3. Set in place, press with heavy roller to attain full adhesion.
- D. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
 - 1. Resilient Strips: Attach to substrate using adhesive.

3.04 INSTALLATION - RESILIENT BASE

- A. Follow manufacturer's installation instructions specific to substrate involved.
- B. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.05 CLEANING

- A. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.

3.06 PROTECTION

- A. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

END OF SECTION

SECTION 096813
TILE CARPETING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Carpet tile, fully adhered (CPT-#)
- B. Removal of existing carpet tile.
- C. Accessories.

1.02 RELATED REQUIREMENTS

- A. Section 096500 - Resilient Flooring; resilient base and flooring transitions.

1.03 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- C. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- D. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- E. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
- F. CRI 104 - Standard for Installation of Commercial Carpet.
- G. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- C. Shop Drawings: Indicate layout of joints and direction of carpet pile.
- D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 016000 - Product Requirements, for additional provisions.
 - 2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.
 - 3. Turn over to owner, for storage on-site or off-site.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum five years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet tile and approved by carpet tile manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.07 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

- B. Maintain minimum 70 degrees F ambient temperature 24 hours prior to, during and 24 hours after installation.
- C. Ventilate installation area during installation and for 72 hours after installation.

1.08 WARRANTY

- A. See Section 017800 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective Work within a one year period after Date of Substantial Completion.
- C. Provide ten year manufacturer warranty for wear.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide Basis of Design manufacturer listed, or a standard or custom product from one of the other listed manufacturers with equivalent performance, material properties, features, general configuration, appearance, and warranty.
- B. Tile Carpeting:
 - 1. Interface, Inc: www.interfaceinc.com.
 - 2. J&J Flooring Group; www.jjflooringgroup.com
 - 3. Milliken & Company: www.milliken.com/#sle.
 - 4. **BASIS OF DESIGN:** Mohawk; www.mohawkflooring.com
 - 5. Shaw Contract
 - 6. Tandus: www.tandus.com/#sle.
 - 7. Substitutions: See Section 016000 - Product Requirements.

2.02 MATERIALS

- A. Tile Carpeting, Type CPT-1: Performance Tufted Loop Pile, manufactured in one color dye lot.
 - 1. Tile Size: 24 by 24 inch, nominal.
 - 2. Properties:
 - a. Dye Method: 100% Solution Dyed
 - b. Primary Backing: EcoFlex ICT
 - c. Total Weight: 38 oz/sq yd
 - d. Radiant Panel: Class 1, when tested in accordance with ASTM E 648
 - e. Smoke Density: < 450, when tested in accordance with ASTM E 662
 - f. Static Electricity (AATCC-134), 20% R.H., 70 degrees F: < .5 KV Permanent Conductive Fiber
 - g. Critical Radiant Flux: Minimum of 0.45 watts/sq cm, when tested in accordance with ASTM E648 or NFPA 253.
 - h. Surface Flammability Ignition: Pass ASTM D2859 (the "pill test").
 - 3. Product: Mohawk Group: First Step II Tile - QL315
 - a. Color: Obsidian 989
 - 4. Install Method: as selected by Architect

2.03 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Transition Strips:
 - 1. Carpet to Concrete: resilient, see Section 096500
 - 2. Carpet to Tile: metal, see Section 093000
 - 3. Carpet to Resilient: resilient, see Section 096500
- C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that subfloor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

- 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 tile.
- C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.
- D. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).
 - 1. Test as Follows:
 - a. Alkalinity (pH): ASTM F710.
 - b. Internal Relative Humidity: ASTM F2170.
 - c. Moisture Vapor Emission: ASTM F1869.
 - 2. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.
- E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

- A. Remove existing carpet tile.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.
- D. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- E. Vacuum clean substrate.

3.03 INSTALLATION

- A. Starting installation constitutes acceptance of subfloor conditions.
- B. Install carpet tile in accordance with manufacturer's instructions and CRI 104 (Commercial).
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. 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.
- F. Fully adhere carpet tile to substrate.
- G. Trim carpet tile neatly at walls and around interruptions.
- H. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 099123
INTERIOR PAINTING

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Surface preparation.
- B. Field application of paints (PT-#)
- C. Owner will paint interior walls, bulkheads and soffits, doors and frames.
- D. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
 - 1. Steel lintels.
 - 2. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
 - 3. Mechanical and Electrical:
 - a. In finished areas, paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, mechanical equipment, and electrical equipment, unless otherwise indicated.
- E. Do Not Paint or Finish the Following Items:
 - 1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
 - 2. Items indicated to receive other finishes.
 - 3. Items indicated to remain unfinished.
 - 4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
 - 5. Floors, unless specifically indicated.
 - 6. Glass.
 - 7. Acoustical materials, unless specifically indicated.
 - 8. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

- A. Section 055000 - Metal Fabrications: Shop-primed items.
- B. Section 092116 - Gypsum Board Assemblies: painting of above-ceiling firewall warning signs.

1.03 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency.
- B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual.
- C. SSPC-SP 1 - Solvent Cleaning.
- D. SSPC-SP 6 - Commercial Blast Cleaning.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 3. If proposal of substitutions is allowed under submittal procedures, explanation of substitutions proposed.
- C. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets

(MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
- 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.
- D. Remove rags and waste from storage areas daily.

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. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above the dew point; or to damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Maximum Application Temperature for Paints: 95 degrees F (35 degree C) for interiors unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
 - 1. In the event that a single manufacturer cannot provide specified products, minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
 - 2. Substitution of other products by the same manufacturer is preferred over substitution of products by a different manufacturer.
- B. Paints:
 - 1. Behr Process Corporation: www.behr.com/#sle.
 - 2. Benjamin Moore & Co: www.benjaminmoore.com.
 - 3. **BASIS OF DESIGN:** Diamond Vogel Paints: www.diamondvogel.com/#sle.
 - 4. PPG Paints: www.ppgpaints.com.
 - 5. Pratt & Lambert Paints: www.prattandlambert.com/#sle.
 - 6. Sherwin-Williams Company: www.sherwin-williams.com.
- C. Primer Sealers: Same manufacturer as top coats.
- D. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND FINISHES - GENERAL

- A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
 - 1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
 3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
 4. Supply each paint material in quantity required to complete entire project's work from a single production run.
 5. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.
- B. Volatile Organic Compound (VOC) Content:
1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - b. Architectural coatings VOC limits of the State in which the Project is located.
 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.
- C. Colors: Match colors indicated in Interior Finish Schedule, or if not indicated, as selected from manufacturer's full range of available colors.
1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - INTERIOR

- A. Ferrous Metals, Unprimed, Latex, 3 Coat;
1. One coat primer; factory-formulated metal primer. Applied to result in a dry film thickness of not less than 2.0 mils.
 - a. Diamond Vogel Cote-All Multi-Purpose Alkyd Primer.
 2. Semi-gloss: Two coats of alkyd enamel. Factory-formulated semigloss alkyd enamel for interior application. Applied to result in result in a dry film thickness of not less than 1.7 mils per coat.
 - a. Diamond Vogel PermAcryl Interior Latex Semi-Gloss Enamel.

2.04 ACCESSORY MATERIALS

- A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces and to achieve the finishes specified whether specifically indicated or not; commercial quality
- B. Patching Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Seal surfaces that might cause bleed through or staining of topcoat.

- D. Ferrous Metal:
 - 1. Solvent clean according to SSPC-SP 1.
 - 2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces.
 - 3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 "Commercial Blast Cleaning". Protect from corrosion until coated.

3.03 APPLICATION

- A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied. When manufacturer does not specify, allow 24 hours for interior paint and 48 hours for exterior paint to dry.
- C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.04 IDENTITY PAINTING

- A. Paint firewall warning signs at rated wall construction above the ceilings as indicated in Section 092116 - Gypsum Board Assemblies.

3.05 CLEANING

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 102113.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Solid plastic toilet compartments (TP-#).
- B. Urinal screens.
- C. Accessories, including benches for shower changing areas.

1.02 RELATED REQUIREMENTS

- A. Section 102800 - Toilet, Bath, and Laundry Accessories: shower curtains, rods, hooks; folding shower seat; clothes hooks.

1.03 REFERENCE STANDARDS

- A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- B. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on panel construction, hardware, and accessories.
- C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.
- D. Samples: Submit two samples of partition panels, 6 by 6 inch in size illustrating panel finish, color, and sheen.
- E. Maintenance Material Submittals: Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents and source.
 - 1. Door Hinges: Two with associated fasteners.
 - 2. Latch and Keeper: Two with associated fasteners.
 - 3. Door Bumper: Two with associated fasteners.
 - 4. Door Pull: Two with associated fasteners.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
- B. Materials: Doors, panels and pilasters shall be fabricated from polymer resins compounded under high pressure, forming a single component which is waterproof, nonabsorbent and has a self-lubricating surface that resists marks from pens, pencils, markers and other writing instruments.
 - 1. All plastic components shall be covered with a protective plastic masking.
- C. Performance Requirements:
 - 1. Fire Resistance: Partition materials shall comply with the following requirements, when tested in accordance with the ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials:
 - a. Class B flame spread/smoke developed rating, tested to ASTM E84.
 - 2. Material Fire Ratings:
 - a. National Fire Protection Association (NFPA) 286: Pass.
 - b. International Code Council (ICC): Class B.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.

1.07 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of toilet fixtures, walls, columns, ceilings, and other construction contiguous with toilet compartments by field measurements before fabrication.
- B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.08 WARRANTY

- A. Manufacturer's standard warranty against breakage, corrosion, and delamination under normal conditions.
 - 1. Length of Warranty: 25 years

PART 2 PRODUCTS**2.01 MANUFACTURERS**

- A. Solid Plastic Toilet and Shower Compartments:
 - 1. Accurate Partitions Corporation
 - 2. Ampco Products, Inc: www.ampco.com/#sle.
 - 3. Bobrick
 - 4. Bradley
 - 5. General Partitions
 - 6. Global Partitions
 - 7. Metpar Corp: www.metpar.com.
 - 8. **BASIS OF DESIGN:** Scranton Products (Santana/Comtec/Capital); Hiny Hiders: www.scrantonproducts.com.
 - 9. Substitutions: Section 016000 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

- A. Solid Plastic Toilet Partitions (TP-#): Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; floor-mounted headrail-braced.
 - 1. Colors: Black.
 - 2. Finish and Texture: EX
- B. Doors:
 - 1. Thickness: 1 inch.
 - 2. Width: 24 inch.
 - 3. Width for Handicapped Use: 36 inch, out-swinging.
 - 4. Height: 55 inch.
- C. Panels:
 - 1. Thickness: 1 inch.
 - 2. Height: 55 inch.
 - 3. Depth: As indicated on drawings.
- D. Pilasters:
 - 1. Thickness: 1 inch.
 - 2. Width: As required to fit space; minimum 3 inch.
- E. Screens: Without doors; to match compartments; mounted to wall with continuous panel brackets.
 - 1. Type: Wall mounted.
 - 2. Size: 18 inches wide by 42 inches high.

2.03 MATERIALS

- A. Plastic Panels: High density polyethylene (HDPE) suitable for exposed applications, non-absorbent, and graffiti-resistant textured surface. waterproof,
- B. Stainless Steel Castings: ASTM A 743/A 743M.
- C. Aluminum: ASTM B 221.

2.04 ACCESSORIES

- A. Pilaster Shoes: Stainless steel, satin finish, 3 inches high; concealing floor fastenings.
 - 1. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster.
- B. Head Rails: Extruded aluminum, anti-grip profile. Clamps around pilaster and is secured to the wall with stainless steel brackets.
- C. Garment Bar: manufacturer's standard; length as required for indicated layout.
- D. Wall and Pilaster Brackets: Anodized aluminum; continuous type, full-height of panel.
- E. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.
 - 1. For attaching panels and pilasters to brackets: Through-bolts and nuts; tamper proof.
- F. Hinges: Anodized aluminum; satin finish.
 - 1. Self-closing, pivot hinges, gravity type, adjustable for door close positioning; two per door, with emergency access by lifting door.
- G. Door Hardware: Anodized aluminum; satin finish.
 - 1. Door Latch and Keeper: Surface-mounted slide latch with flat rubber-faced combination door strike and keeper, meeting requirements for accessibility at accessible compartments.
 - 2. Door Pull: Standard unit on outside of inswing doors.
 - a. Equip outswing handicapped doors with second door pull and door stop.
- H. Coat Hook with Rubber Bumper: One per compartment, mounted on door.
 - 1. Combination hook and rubber-tipped stop, sized to prevent door from hitting compartment-mounted accessories. Provide wall bumper where door abuts wall. Provide formed L-shaped hook without stop at outswing doors.
- I. Door Bumper: Manufacturer's standard rubber-tipped bumper at out-swinging doors.
- J. Shower Curtains (CF-#):
 - 1. Curtains: see Section 102800 - Toilet Accessories
- K. Curtain Hooks: provide manufacturer's standard sliding curtain hooks for mounting in headrail.
- L. Heat-Sink Strip: Manufacturer's standard continuous, stainless-steel strip fastened to exposed bottom edges of solid-polymer components to prevent burning.

2.05 FABRICATION

- A. Overhead-Braced Units: Provide manufacturer's standard corrosion-resistant supports, leveling mechanism and anchors at pilasters to suit floor conditions. Provide shoes at pilasters to conceal supports and leveling mechanism

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field measurements are as indicated on shop drawings.
- B. Verify correct spacing of and between plumbing fixtures.
- C. Verify correct location of built-in framing, anchorage, and bracing.
- D. Clean surfaces thoroughly prior to installation.

3.02 INSTALLATION

- A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

- B. Maintain 3/8 inch to 1/2 inch space between wall and panels and between wall and end pilasters.
- C. Attach panel brackets securely to walls using anchor devices.
- D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.
- E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

- A. Maximum Variation From True Position: 1/4 inch.
- B. Maximum Variation From Plumb: 1/8 inch.
- C. Maximum Clearances:
 - 1. Pilasters and Panels: 1/2 inch
 - 2. Panels and Walls: 1 inch

3.04 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.
- B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.
- C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 102800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL**1.01 SECTION INCLUDES**

- A. Commercial toilet accessories, including but not limited to:
 - 1. Framed Mirrors
 - 2. Grab Bars
 - 3. Sanitary Napkin Disposals
- B. Commercial shower and bath accessories, including but not limited to:
 - 1. Robe Hooks
 - 2. Shower Curtains (CF-#) and Hooks
 - 3. Folding Shower Seats
 - 4. Coat/Robe Hooks
- C. Utility room accessories, including:
 - 1. Mop and Broom Holders
- D. Installation of owner-provided items, including but not limited to:
 - 1. Toilet Paper Dispenser
 - 2. Paper Towel Dispenser
 - 3. Soap Dispenser

1.02 RELATED REQUIREMENTS

- A. Section 093000 - Tiling; substrate finish, coordination with joints and for recessed items.
- B. Section 102113.19 - Plastic Toilet Compartments: coat hooks on back of partition doors.
- C. Section 224000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design.
- B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- D. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- E. ASTM B456 - Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.
- F. ASTM C1036 - Standard Specification for Flat Glass.
- G. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror.
- H. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

1.06 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.07 WARRANTY

- A. Special Mirror Warranty: Manufacturer's standard form in which manufacturer agrees to replace mirrors that develop visible silver spoilage defects and that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: 15 years from date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Commercial Toilet, Shower, and Bath Accessories:
 - 1. AJW Architectural Products: www.ajw.com.
 - 2. ASI - American Specialties, Inc: www.americanspecialties.com.
 - 3. Bradley Corporation: www.bradleycorp.com.
 - 4. **BASIS OF DESIGN:** Bobrick Washroom Equipment, Inc.; www.bobrick.com
 - 5. Georgia-Pacific Professional: www.blue-connect.com.
 - 6. Substitutions: Section 016000 - Product Requirements.
- B. Provide products of each category type by single manufacturer.
- C. See schedule, plans and elevations for quantities and locations.

2.02 MATERIALS

- A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
 - 1. Grind welded joints smooth.
 - 2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.
- B. Keys: Provide four keys for each accessory to Owner; master key lockable accessories.
- C. Stainless Steel Sheet: ASTM A666, Type 304.
- D. Stainless Steel Tubing: ASTM A269/A269M, Grade TP304 or TP316.
- E. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized; tamper-proof; security type.
- G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

- A. Stainless Steel: Satin finish, unless otherwise noted.
- B. Chrome/Nickel Plating: ASTM B456, SC 2, polished finish, unless otherwise noted.
- C. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.
- D. Galvanizing for Items Other than Sheet: Comply with ASTM A123/A123M; galvanize ferrous metal and fastening devices.
- E. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 COMMERCIAL TOILET ACCESSORIES

- A. Toilet Paper Dispenser: Double roll, surface mounted, for coreless type rolls.
 - 1. Owner-furnished, Contractor-installed.

- B. Paper Towel Dispenser: Folded paper type, stainless steel, surface-mounted, with viewing slots on sides as refill indicator and tumbler lock.
 - 1. Capacity: 300 C-fold minimum.
 - 2. Owner-furnished, Contractor-installed.
- C. Waste Receptacle: Owner-furnished, owner-installed
- D. Soap Dispenser: Liquid soap dispenser, wall-mounted, surface, with stainless steel cover and horizontal stainless steel tank and working parts; push type soap valve, check valve, and window gauge refill indicator, tumbler lock.
 - 1. Minimum Capacity: 40 ounces.
 - 2. Owner-furnished, Contractor-installed
- E. Mirrors: Stainless steel framed, 1/4 inch thick tempered safety glass; ASTM C1048.
 - 1. Annealed Float Glass: Silvering, protective and physical characteristics in compliance with ASTM C1503.
 - 2. Size: 24 by 36 inches, unless indicated otherwise.
 - 3. Frame: 0.05 inch channel shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish.
 - 4. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and nonabsorptive filler material.
 - 5. Products:
 - a. Bobrick B-290.
 - b. Substitutions: Section 016000 - Product Requirements.
- F. Grab Bars: Stainless steel, smooth surface.
 - 1. Standard Duty Grab Bars:
 - a. Push/Pull Point Load: 250 pound-force, minimum.
 - b. Dimensions: 1-1/4 inch outside diameter, minimum 0.05 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
 - c. Finish: Satin.
 - d. Nonslip grasping surface finish and snap flange concealed fasteners.
 - e. Length and Configuration: 36 inches, 18 inches, and 42 inches.
 - f. Products:
 - 1) Bobrick B-5806 Series.
 - 2) Substitutions: Section 016000 - Product Requirements.
 - g. Provide Bobrick 258 Series Anchors where grab bars are to be installed on toilet partitions.
 - 1) Type 304, 16 gauge, satin-finish stainless steel backplate. Threaded chrome-plated brass connectors shall be keyed to backplate to prevent rotation. Stainless steel machine screws shall be furnished by manufacturer.
- G. Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.
 - 1. Products:
 - a. Bobrick B-254 Classic Series.
 - b. Substitutions: Section 016000 - Product Requirements.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

- A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for concealed mounting.
 - 1. Length: As indicated on the Drawings.
 - 2. Products:
 - a. Bobrick B-207.
 - b. Substitutions: Section 016000 - Product Requirements.
- B. Shower Curtain Hooks: Type 304 stainless steel.
 - 1. Products:

- a. Bobrick B-204-1.
 - b. Substitutions: Section 016000 - Product Requirements.
- C. Shower Curtain (CF-#):
- 1. Size: 36 by 72 inches, hemmed edges.
 - 2. Grommets: Stainless steel; pierced through top hem on 6 inch centers.
 - 3. Color: As selected from manufacturer's standard colors.
 - 4. Products: as indicated in Finish Schedule
 - a. Substitutions: Section 016000 - Product Requirements.
- D. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, hinges and mechanical fasteners of Type 304 stainless steel, L-shaped seat.
- 1. Seat: 1/2-inch thick solid phenolic one-piece seat with integral slots for drainage, of color as selected.
 - 2. Seat Dimensions: 33" wide x 22-5/16" deep.
 - 3. Frame: 18-8, Type 304, stainless steel with satin finish, 16 gauge, 1-1/4" square tubing and 18 gauge, 1" diameter seamless tubing.
 - 4. Baseplate: 18-8, type 304, heavy gauge stainless steel.
 - 5. Spring: 17-7, Type 301, 24 gauge stainless steel, spot welded to baseplate.
 - 6. Guide Bracket: 18-8, Type 304, 16 gauge stainless steel with satin finish.
 - 7. Weight Limit: 360 pounds.
 - 8. Size: ADA Standards compliant.
 - 9. Products:
 - a. Bobrick B-5181.
 - b. Substitutions: Section 016000 - Product Requirements.
- E. Clothes Hook: Heavy-duty stainless steel, single-prong, round bracket and backplate for concealed attachment, satin finish.
- 1. Location: One (1) at each shower stall.
 - 2. Products:
 - a. Basis-Of-Design: Bobrick B-2116.
 - b. Substitutions: Section 016000 - Product Requirements.

2.06 UNDER-LAVATORY PIPE AND SUPPLY COVERS

- A. Specified in 224000 - Plumbing Fixtures.

2.07 UTILITY ROOM ACCESSORIES

- A. Combination Utility Shelf/Mop and Broom Holder: 0.05 inch thick stainless steel, Type 304, with 1/2 inch returned edges, 0.06 inch steel wall brackets.
 - 1. Drying rod: Stainless steel, 1/4 inch diameter.
 - 2. Hooks: 3, 0.06 inch stainless steel rag hooks at shelf front.
 - 3. Mop/broom holders: Three spring-loaded rubber cam holders at shelf front.
 - 4. Length: 34 inches.
 - 5. Products:
 - a. Bobrick B-239.
 - b. Substitutions: Section 016000 - Product Requirements.

2.08 MISCELLANEOUS ACCESSORIES

- A. Robe Hook: 1" nominal square single hook projecting 1-inc nominal from wall; type 304 satin stainless steel with exposed fasteners
 - 1. Product: Bobrick B-233 or approved equal.

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.

3.02 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements 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.
 - 2. Mirrors: 40 inch, measured to bottom of mirrored surface.
 - 3. Other Accessories: As indicated on drawings.
 - 4. Where toilet paper dispenser mounting conflicts with a grab bar, mount above grab bar with bottom of dispenser 12 inches clear above grab bar, but no higher than 48 inches above finish floor.

3.04 PROTECTION

- A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 22 05 00 - PLUMBING COMMON REQUIREMENTS**PART 1 - GENERAL****1.1 GENERAL SUPPLEMENTARY AND OTHER CONDITIONS OF THE CONTRACT**

- A. The general, supplementary and other Conditions of the Contract and the General Requirements (Division 1) are hereby made a part of this section.

1.2 INTENT OF PLANS AND SPECIFICATIONS

- A. The plans and specifications contemplate the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the Owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many minute items which may be required by the nature of the systems. The Contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly herein, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. In receiving bids, it will be assumed that each bidder has made a thorough inspection of the conditions and is familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions prior to submitting the bid will not be allowed.

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all state and local codes and ordinances applying to the work specified herein. Attention is directed in particular to the IOWA PLUMBING CODE, UNIFORM PLUMBING CODE, INTERNATIONAL BUILDING CODE AND/OR ANY AUTHORITY HAVING JURISDICTION, and local regulations concerning the specified plumbing equipment.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Bidders shall familiarize themselves with local regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

1.4 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

1.5 SUBSTITUTING

- A. Proposals to Contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the Architect/Engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in

type, function, quality of material and assembly and meet the requirements indicated in drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as acceptable equals for quotations and use, approval will be issued in an addendum.

1.6 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer for approval, prior to the placing of orders for any equipment, a complete schedule of plumbing equipment and fixtures to be installed. The schedule shall consist of catalogs, cuts, diagrams, shop drawings, performance curves or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. The schedules shall list the operating conditions of the equipment at the conditions listed on the schedules. Provide shop drawings in electronic 'PDF' format suitable for use on Submittal Exchange or similar program.
- B. All shop drawings shall be submitted by the Contractor and shall have been signed, "approved" and initialed by the Contractor prior to submittal to the Engineer. The Engineer will check the shop drawings to aid in interpreting the plans and specifications, and in so doing will assume that the shop drawings conform to all specified requirements set forth in this specification. The approval of the shop drawings by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the specification.
- C. The determination of quantities of material and equipment required shall be made by the Contractor from the drawings. Schedules on the drawings and in the specification are completed as an aid to the Contractor, but where discrepancies arise, it shall not release the Contractor from providing the proper number to complete this work.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 TESTS

- A. Tests shall be performed on the systems Specified herein.
- B. All tests shall be made in the presence of the Engineer. Building official and/or Owner may be present. Engineer shall receive 2 days' notice prior to any testing. The Contractor shall submit a letter for approval containing the name and position of the people who will witness the tests. Where required, perform such tests in the presence of local or state building inspection officials. The Contractor shall maintain reports of all tests as they are performed. The reports shall contain the following information:

1. Project
 2. Contractor
 3. Date
 4. Test performed and portion of system tested
 5. Test results
 6. Name and signature of person performing test
 7. Name and signature of witness of the test
- C. Upon completion of the project the test reports shall be submitted with the operation and maintenance manuals for review by the Engineer.
- D. Soil, waste, and vent and storm drainage piping shall be tested in accordance with applicable state and local codes. The minimum test shall be as follows: The water test shall be applied to the drainage and vent systems either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system filled with water to point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest opening of the section under test, and each section shall be filled with water, but no section shall be tested with less than ten (10) foot head of water. In testing successive sections, at least the upper ten (10) feet of the next preceding section shall be tested, so that no joint or pipe in the building (except the uppermost ten (10) feet of the system) shall have submitted to a test of less than a ten (10) foot head of water. The water shall be kept in the system, or in the portion under test, for at least fifteen (15) minutes before inspection starts. The system shall then be tight at all points. All joints shall remain exposed until testing has been completed. At the Contractor's option, an air test may be used in lieu of the water test. The section of piping to be tested shall be pressurized to 5 psig. The piping under test shall be pressurized for at least 15 minutes before inspection starts and shall hold this pressure for at least 15 minutes without introduction of additional air. All joints shall remain exposed until testing has been completed.
- E. Domestic water piping shall be tested and proven watertight under a hydrostatic pressure of 125 psig. The piping system shall maintain the test pressure without loss for 2 hours. Loss shall be determined by a drop in gauge pressure or visual leakage. The test pressure shall be read from a gauge location at the low elevation of the system or portion being tested.

3.2 STERILIZATION OF THE WATER SUPPLY

- A. Chlorinate all domestic hot and cold water lines to comply with local and State health regulations.
- B. The chlorinating agent shall be applied at the start of a new line and shall be injected through a corporation cock or similar device, to insure complete chlorination of all pipe.
- C. Calcium hypochlorite shall be used where applicable and shall be commercial products such as H.T.H., Perchloron, or Mexochloron. The calcium hypochlorite shall first be mixed to a homogeneous paste. The paste shall contain approximately five (5) percent available chlorine by weight. The paste shall then be thinned to a slurry and mixed with water to obtain a resultant consistency of 100 parts per million. This mixture shall be fed into the pipeline and retained for a one-hour contact period. All valves shall then be

opened in groups of three and water of 100 parts per million calcium chlorite concentration run through for a ten minute interval for each group of valves.

- D. After chlorination, all valves shall be opened and water run through to waste for a ten minute period or until the waste water indicates a residual of not over 0.5 parts per million.
- E. Have an approved independent testing agency test and certify that the potable water system meets the requirements of local health authorities before using for domestic service. Upon completion of the system a representative sample shall be obtained by the testing agency at random outlets on the project. If test sample does not prove to be potable, the entire project's potable water system shall be sterilized by the Contractor at no additional cost to the Owner. Furnish a copy of the test to the Engineer and the local utility.

3.3 ALL EQUIPMENT FURNISHED UNDER DIVISION 22

- A. At a time set by the Contractor and agreed to by the Owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the Owner.
- B. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.
- C. Run operating test for 30 hour periods and submit data for approval.
- D. All equipment shall be charged with clean media and installation completely finished prior to acceptance.
- E. Properly balance all pumped water systems.

3.4 OPERATION AND MAINTENANCE MANUALS

- A. Prepare a portfolio with a complete set of shop drawings of the equipment used in the erection of the plumbing systems and equipment testing, cleaning and maintenance instructions, operation and maintenance manuals, list of materials for the maintenance, parts list, wiring diagrams, and name and address of authorized service organization.
- B. Information shall be folded only if necessary, and bound in an 8-1/2" x 11" hard cover indexed, loose-leaf binder. Multiple binders shall be used if required to contain material. All material shall be properly identified with job name, date, and the names and addresses of the Contractor, Architect, and Engineer. Provide manuals in electronic 'PDF' format in addition to the printed copies.
- C. The portfolio shall be submitted to the Engineer for review of material and completeness prior to final inspection, and when approved by the Engineer, the portfolios shall be turned over to the Owner.

3.5 PROJECT CLOSE OUT

- A. The Plumbing Contractor shall arrange for an inspection of all items installed in the ceiling before the ceiling or ceiling tile is installed. The Engineer shall be informed at least one week before the planned installation of the ceiling to arrange the inspection. If the ceiling tile is installed before the inspection, the Plumbing Contractor shall remove all the ceiling tiles prior to the inspection.
- B. General: Refer to Division 1 sections for general closeout requirements. Maintain a daily log of operational data on plumbing equipment and systems throughout the closeout period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Engineer.
- C. Record Drawings: Give special attention to the complete and accurate recording of underground conduit, piping and concealed and non-accessible work, branching arrangement and valve location of all piping systems and work of change orders where not shown on contract documents.
- D. Closeout Equipment/Systems Operations: Sequence operations properly so that work of the project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment with the Owner's operating personnel present to demonstrate sustained, satisfactory performance. Adjust and correct operations as needed for proper operation. Clean and lubricate each system, excessively worn parts and similar expendable parts of the system.
- E. Operating Instructions: Conduct a walk-through instruction seminar for the Owner's personnel to be involved in the operation and maintenance of the plumbing equipment and systems. Explain the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the system.
 - 1. Provide written verification that operating instructions have been provided, signed off by an Owner's Representative.
- F. Turn-Over of Operation: At the time of substantial completion, turn over the prime responsibility for the operation of the system to the Owner's personnel. However until the time of final acceptance, provide at least one full-time operating technician, who is completely familiar with the work, to consult with and continue training the Owner's personnel. Additional training shall take place as specified in other sections.
- G. Final Completion: The following special requirements shall be provided in addition to those specified elsewhere:
 - 1. The Contractor shall not call for final completion check until the plumbing systems and equipment have been installed, adjusted, balanced, and are in full and complete satisfactory operation and the following certifications of inspection from equipment suppliers have been completed and submitted with the Architect/Engineer. Certifications of inspection are required for the following items of equipment:
 - a. Plumbing Equipment (Local Rep.)

2. The certifications shall consist of letters signed by Factory Trained and Authorized Service Engineers stating the following:
 - a. They have inspected all their equipment on the project.
 - b. They approve the condition of their equipment and its installation.
 - c. They have fully checked its operation and certify that it is operating properly.
 - d. They will note any problems, conditions or objections that could lead to future operating problems.
 3. Exceptions may be permitted upon written request from the Contractor listing any minor items that are uncompleted and beyond his reasonable control. Provide a full guarantee that they be completed at a named later date and the guarantee shall be extended as required to provide a full warranty.
- H. Final Payment will not be made until the Contractor has satisfactorily completed all final inspection items.
- I. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The Contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. The Owner has the right to order repairs to any equipment or work provided hereon and to charge the Contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

END OF SECTION 22 05 00

SECTION 22 05 10 - BASIC MATERIALS AND METHODS**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. All work done under Division 22 shall be in accordance with the requirements of this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following section shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements

PART 2 - (NOT APPLICABLE)**PART 3 - EXECUTION****3.1 INSTALLATION OF THE WORK**

- A. The Contractor shall examine all the drawings before proceeding with the layout and installation of his work. General and electrical wiring contract drawings will be made available to this Contractor. SHOULD DISCREPANCIES AFFECTING THE WORK BE FOUND, THE CONTRACTOR SHALL IMMEDIATELY REPORT SAME TO THE ENGINEER FOR INSTRUCTIONS. Subsequent changes made necessary by the neglect of any Contractor to discover and report such discrepancies shall be made by and at the expense of the Contractor, under the direction of the Engineer.
- B. Furnish, provide, and/or install shall be considered as requiring the Contractor to both furnish the equipment and install it unless specific reference is made to the furnishing or installing of the equipment by others.
- C. The Contractor shall confer and cooperate with other Contractors on the job in the installation of his work so all work will be installed in proper relationship to the surrounding location and shape of any part to avoid conflicts. The Contractor shall be responsible for the correct size and location of any changes, slots, and openings required by him and shall be required to do, at his expense, any cutting or patching made necessary by his failure to make proper arrangements in this respect.
- D. Pipes shall be located essentially as shown on the drawings, but in exact locations as laid out by the Contractor on the job to suit actual conditions. Exposed pipes shall be arranged as closely as practical to wall or ceiling surfaces. Indicated connections to equipment are based on equipment of a given manufacturer. If the Contractor proposes to use "approved equal" equipment, then it shall be understood that the Contractor shall assume the responsibility for proper location in a manner approved by the Engineer. Changes made necessary for this reason will be made by, and at the expense of this Contractor.
- E. The Contractor shall follow the equipment manufacturer's instructions and recommendations in the installation and connection of all equipment and materials

furnished under this contract. In the event of conflict or discrepancy between manufacturer's instructions and the contract documents, the Contractor shall notify the Engineer before proceeding. No equipment installation shall be made in a manner that voids the manufacturer's warranty of the equipment.

- F. Any hazardous waste or asbestos required to be removed, encapsulated or otherwise contained during the course of this project shall be performed by the Owner. E.D.A. Inc. shall be indemnified from any and all liability associated with the removal, encapsulation or containment of hazardous waste or asbestos.

3.2 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. If installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated, suitable allowances shall be made by the equipment supplier and/or Contractor.

3.3 RECORD DRAWING

- A. The Architect will furnish the Contractor a set of prints of the plumbing drawings as issued for this contract. The Contractor shall use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At the completion of the job the drawings shall be delivered to the Engineer for a permanent record of the exact location of all equipment, pipe runs, etc., as incorporated in the job.

3.4 CLEANING

- A. Labels, stickers, etc., shall be removed and the entire installation left in a clean, usable condition.
- B. Plumbing equipment, fixtures, tanks, heat exchangers, pumps, traps, etc., shall be thoroughly cleaned.

3.5 PAINTING

- A. Finishes of all equipment shall be protected during storage, installation and until final acceptance. Any damage or imperfections shall be "touched up" or if extensive, the entire unit shall be repainted as directed by the Engineer.

3.6 SLEEVES

- A. The Plumbing Contractor shall set and maintain all sleeves. Any pipe passing through building construction including walls, floors, roofs or masonry partitions shall be encompassed with sleeves in accordance with the following.
- B. All pipe sleeves through slabs, floors, masonry walls and partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.

- C. Sleeves shall be schedule 40 steel pipe. Wall sleeves shall be flush with the wall surface. The top of floor sleeves shall extend 1" above the floor, the bottom of the sleeve shall be flush with the underside of the floor.
- D. The space between the pipe and the sleeves, through fire rated walls and floors shall be protected as designated in Section 22 05 11.
- E. Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. The wall plates shall have set screws or spring locks for clamping to the pipe.
- F. All pipes through sound rated walls or walls which run up to the deck above shall be sealed to prevent sound transmission and maintain the wall's sound rating.

3.7 EXISTING SERVICES

- A. The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.
- B. All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of service if possible.
- C. All inactive services which are encountered shall be protected, or removed as directed by the Owner, Utility Company, or Municipal Agency having jurisdiction.
- D. When active services must be temporarily interrupted, arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

3.8 ACCESS TO EQUIPMENT

- A. Access shall be provided to all motors, valves, dampers, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The General Contractor will provide access panels and doors required in the building construction where shown on the plans. The location of the access openings relative to the plumbing equipment shall be coordinated to assure proper access to the equipment.

3.9 PROTECTIVE DEVICES

- A. All sheaves, belts, drives, couplings, and moving parts shall be protected by OSHA approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

END OF SECTION 22 05 10

SECTION 22 05 11 - PLUMBING FIRESTOPPING**PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Through-penetration firestopping in fire rated construction.
 2. Through-penetration smoke stopping in smoke partitions.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
1. 22 05 00 - Plumbing Common Requirements
 2. 22 05 10 - Basic Materials and Methods

1.3 REFERENCES

- A. Underwriters Laboratories
1. UL Fire Resistance Directory
 - a. Through-penetration firestop devices (XCHR)
 - b. Fire resistance ratings (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void or cavity material (XHHW)
- B. American Society for Testing and Materials Standards:
1. ASTM E 814-88: Standard Test Method for Fire Tests of Through-Penetration Firestops.

1.4 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire gasses and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

- F. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.5 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound or vibration absorption and at other construction gaps.
 - 2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and type of construction and at all separations required to permit building movement and sound or vibration absorption and at other construction gaps.

1.6 SUBMITTALS

- A. Submit in accordance with Section 22 05 00, unless otherwise indicated.
- B. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware and installation procedures, plus the following specific requirements.
 - 1. Details of each proposed assembly identifying intended products and applicable UL system number or UL classified devices.
 - 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgements and drawings relating to non-standard applications.

1.7 QUALITY ASSURANCE

- A. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers or UL classified devices.
- B. Materials shall have been tested to provide fire rating at least equal to that of the construction.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping:
 - 1. Deliver products in original unopened packaging with legible manufacturer's identification.

2. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- B. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.9 PROJECT CONDITIONS

- A. Existing Conditions:
1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
 2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.
- B. Environmental Requirements:
1. Furnish adequate ventilation if using solvent.
 2. Furnish forced air ventilation during installation if required by manufacturer.
 3. Keep flammable materials away from sparks or flame.
 4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

PART 2 - PRODUCTS

2.1 THROUGH-PENETRATION FIRESTOPPING AND FIRE-RATED CONSTRUCTION

- A. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free.
1. Additional Requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
 2. Acceptable Manufacturers and Products:
 - a. Manufacturer shall be 3M or S.T.I.
 - b. Products shall be listed in the UL Fire Resistance Directory for the UL system.
 3. All firestopping products must be from a single manufacturer.

2.2 SMOKE STOPPING AT SMOKE PARTITIONS

- A. Through-Penetration Smoke-Stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2.3 ACCESSORIES

- A. Fill, Void or Cavity Materials: As classified under category XHHW in the UL Fire Resistance Directory.
- B. Forming Materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.3 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where rated walls are constructed with horizontally continuous air space, double width masonry or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.
- F. Install smoke stopping as specified for firestopping.

3.4 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION 22 05 11

SECTION 22 05 14 - DEMOLITION

PART 1 - GENERAL

1.1 GENERAL DEMOLITION

- A. Extent of demolition shall be as shown on the drawing.
- B. All items which the Owner does not wish to retain shall be removed and disposed of off site.
- C. SUBMIT PROPOSED SCHEDULE OF WORK TO ARCHITECT AND OWNER FOR REVIEW PRIOR TO START OF WORK. INCLUDE IN SCHEDULE COORDINATION FOR SHUT-OFF CAPPING AND CONTINUATION OF UTILITIES.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXECUTION PROCEDURE

- A. Demolish in an orderly and careful manner as required to accommodate new work. Protect existing supporting structural members.
- B. Repair all demolition performed in excess of that required at no cost to the Owner.
- C. Cap all pipes below floor or above ceiling. Remove all excess pipes and ducts.
- D. All items to be retained by Owner shall be carefully removed and stored as directed by the Owner.
- E. Remove from site and dispose of off site all debris, rubbish, and all other items which the Owner does not retain.

END OF SECTION 22 05 14

SECTION 22 05 15 - EXCAVATION FOR UTILITIES**PART 1 - GENERAL****1.1 EXCAVATION WORK**

- A. Excavation shall be as indicated on the drawings. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction. Comply with applicable portions of the International Building Code. The testing laboratory hired to perform testing and inspection service during backfill shall be hired by the contractor not the subcontractor.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

1.3 JOB CONDITIONS

- A. Locate existing utilities in work areas. If utilities are to remain in place, provide adequate means of support and protection during excavation operations. Should uncharted utilities be encountered during excavation consult utility owner immediately for directions. Cooperate with building owner and utility companies in keeping all services in operation. Repair damaged utilities to the satisfaction of the utility owner.
- B. No explosives shall be used.
- C. Barricade open excavations and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

PART 2 - PRODUCTS**2.1 SOIL MATERIALS**

- A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, GC, SW, SP, SM and SC.
- B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups ML, MH, CL, CH, OL, OH and PT.
- C. Satisfactory fill materials shall be satisfactory soil materials free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restriction or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- B. Shoring and Bracing: Provide materials for shoring and bracing such as sheet piling, uprights, stringers and cross braces in good condition. Comply with requirements of local codes and authorities having jurisdiction for trench shoring and bracing. Maintain shoring and bracing in trenches regardless of time trenches will be open. Carry down shoring and bracing as work progresses.
- C. Prevent water from flowing into excavations and flooding project site and surrounding area. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings and detrimental soil changes. Provide and maintain pumps and other equipment needed to convey water away from excavations.
- D. Stockpile excavated materials until required for backfill. Place grade and shape stockpiles for proper drainage. Locate and retain materials away from the edge of trenches.
- E. Trenches shall be dug to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit.
 - 1. Excavate trenches to depth indicated or required. Carry depth of trenches to establish indicated flow lines and elevations. Beyond building perimeter, keep trenches deep enough to prevent freeze-ups.
 - 2. Where water is encountered within 12" of the pipe invert, carry excavation a minimum of 6" below required elevation and backfill with crushed stone or gravel prior to installation of pipe.
 - 3. For pipes 5" or less in nominal size hand excavate bottom cut to required depth and support pipe on undisturbed soil.
 - 4. For pipes 6" and over excavate to 6" below required depth.
 - 5. Unless otherwise indicated excavate for exterior piping so top of piping is at least 4'-6" below grade.
 - 6. Grade bottom of trenches notching under pipe to provide solid bearing for entire pipe body.
- F. Protect all trench bottoms from freezing.

3.2 COMPACTION

- A. Control soil compaction during construction providing minimum percentage of density as specified below.

1. Slabs, roads and paved areas: Compact each layer of backfill to a minimum of 95% maximum density.
 2. Lawn or unpaved areas: Compact each layer of backfill to a minimum of 92% maximum density.
 3. Walkways: Compact each layer of backfill to a minimum of 95% maximum density.
- B. Moisture in the soil shall be controlled to plus or minus 2% of optimum moisture when the soil is placed. When subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material to prevent free water appearing on surface during or subsequent to compaction operations. Remove and replace, or scarify and dry soil material that is too wet to permit compaction to proper density. Soil that has been removed because it is too wet for compaction may be stockpiled or spread to allow to dry.

3.3 BACKFILL

- A. Place acceptable soil material in layers to required subgrade elevations. Use subbase material under pipes where indicated. Shape to fit bottom 90 degrees of pipe cylinder.
- B. Backfill excavations as soon as possible but not until the completion of the following.
1. Inspection, testing, approval and recording locations of underground utilities.
 2. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.
 3. Removal of trash and debris.
- C. Place backfill in layers not more than 8" in loose depth for material compacted by heavy equipment, and not more than 4" for hand operated tampers. Before compaction, moisten or aerate each layer as needed to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Place backfill materials evenly adjacent to structures and piping to required elevations. Take care to prevent displacement of piping by carrying material around piping to approximately the same elevation in each lift.

3.4 FIELD QUALITY CONTROL

- A. Quality Testing Control During Construction: Allow testing service to inspect and approve backfill layers before further construction work is performed.
1. Perform field density tests in accordance with ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method) or ASTM D 2922 (nuclear method), as applicable. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gages shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of the job, on each type of material encountered and at intervals as directed by Architect/Engineer.
 2. In each compacted backfill layer, make one field density test for every 200 ft. of trench.

- B. If in the opinion of the Architect/Engineer, based on testing service reports and inspection, fills which have been placed are below specified density, provide additional compaction at no added charge. The contractor shall be responsible for the cost of any re-testing required by failed tests.

3.5 MAINTENANCE

- A. Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other surface) add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of surface or finish of adjacent work and eliminate evidence to greatest extent possible.

END OF SECTION 22 05 15

SECTION 22 05 23 - VALVES**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with Installation requirements. Provide end connections which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option.
- B. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe size.
- C. Operators: Provide handwheels, fastened to valve stem, for valves other than quarter-turn. Provide lever handle for quarter-turn valves, 6" and smaller. Provide gear operated handwheels for valves larger than 6".

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings
 - 4. 22 05 29 - Pipe Supports and Anchors

1.3 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 22 05 00.
- B. Indicate pressure and temperature classifications and joining methods for all types of valves used in the project.

1.4 STANDARDS

- A. All valves shall meet the standards of the Reduction of Lead in Drinking Water Act and SDWA Safe Water Drinking Act pertaining to potable water systems.

PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. The following valve manufacturers shall be approved: Apollo, Hammond, Lunkenheimer, Milwaukee, Nibco, Watts or Wilken. Circuit setters shall be HCi with Bell and Gossett Circuit Setter Plus, Nibco Flo-Boss and Nexus MBNL considered as equal.

2.2 BALL VALVES

- A. Bronze ball valves shall be Nibco No. T-585-LF threaded, S-585-LF solder, full port, 125 PSI steam, 400 PSI WOG. Valves shall conform to MSS SP-110. Furnish with extended lever handle.

2.3 CHECK VALVES

- A. Bronze swing check valves shall be Nibco No. T-413-Y-LF threaded, S-413 solder, 125 PSI Steam, 200 PSI WOG. Valves shall conform to MSS SP-80.
- B. Bronze spring check valves shall be Nibco No. T-480-Y-LF threaded, S-480 solder, 125 PSI steam, 250 PSI WOG.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.
- B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.
- C. Install extended-stem valves, where insulation is indicated, arranged in proper manner to receive insulation.

3.2 SELECTION

- A. Select and install valves with the following ends or types of pipe-tube connections:
 - 1. Tube Size 2" and Smaller: Soldered joint valves.
 - 2. Pipe Size 2" and Smaller: Threaded valves.
 - 3. Pipe Size 2-1/2" and Larger: Victaulic or flanged.

END OF SECTION 22 05 23

SECTION 22 05 29 - PIPE SUPPORTS AND ANCHORS**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustment to maintain pitch required for proper drainage. They shall allow for expansion and contraction of the piping.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings
 - 4. 22 05 23 - Valves
 - 5. 22 07 00 - Plumbing Insulation

1.3 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 22 05 00.
- B. Indicate pipe hangers to be used for each size and type of pipe.

PART 2 - PRODUCTS**2.1 HANGERS**

- A. Hangers shall be constructed of malleable or wrought iron, and hangers supporting copper pipe shall be copper plated. Hangers for pipe 3 inches and smaller shall be adjustable split ring, Anvil Figure 69, galvanized and Anvil Figure CT-69, copper plated. For piping above 3 inches, hangers shall be adjustable, clevis type, Anvil Figure 260 or 300.
- B. Provide hanger rods complete with adjusting and lock nuts. Minimum hanger rod diameter shall be 3/8". Hanger rod loading shall not exceed the following values:
 - 1. 3/8" Rod: 610 lbs.
 - 2. 1/2" Rod: 1,130 lbs.
 - 3. 5/8" Rod: 1,810 lbs.
 - 4. 3/4" Rod: 2,710 lbs.
 - 5. 7/8" Rod: 3,770 lbs.
 - 6. 1" Rod: 4,960 lbs.
 - 7. 1-1/4" Rod: 8,000 lbs.

PART 3 - EXECUTION**3.1 INSTALLATION**

- A. Where groups of three or more pipes occur, they may be supported with trapeze hangers using two hangers as specified with a capped pipe cross member.
- B. Pipe hangers shall not be attached to the roof or floor decks. Hangers shall be attached to the steel construction with beam clamps, beam attachment and brackets bolted to joists and beams. The Contractor shall endeavor to hang near joist panel joints wherever possible.
- C. Pipe hangers for insulated piping shall be large enough to encompass the insulation, using a metal shield so the vapor barrier jacket will not be broken. See Section 22 07 00, Plumbing Insulation.
- D. Hanging from one pipe to another is prohibited.
- E. Pipe hangers shall be installed with the following spacing:
 - 1. Horizontal Steel Pipe:
 - a. Pipe Size: Up to 1-1/4" Maximum Spacing: 8 Feet
 - b. Pipe Size: 1-1/2" to 3" Maximum Spacing: 10 Feet
 - c. Pipe Size: 4" to 6" Maximum Spacing: 12 Feet
 - 2. Horizontal Copper Pipe:
 - a. Pipe Size: 1/2" to 3/4" Maximum Spacing: 5 Feet
 - b. Pipe Size: 1" Maximum Spacing: 6 Feet
 - c. Pipe Size: 1-1/4" Maximum Spacing: 7 Feet
 - d. Pipe Size: 1-1/2" to 2" Maximum Spacing: 8 Feet
 - 3. Horizontal cast iron soil pipe shall be supported at five foot intervals except where 10 ft. lengths of pipe are used, 10 ft. intervals may be used.
 - 4. Horizontal and vertical plastic pipe shall be supported 4'-0" on center.
 - 5. Vertical piping except plastic shall be supported at each floor.
- F. Install hangers within 12 inches of horizontal tees, elbows, joints, valves, strainers and other specialties and equipment.

END OF SECTION 22 05 29

SECTION 22 05 53 - PLUMBING IDENTIFICATION**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. All piping and plumbing equipment shall be identified as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.

1. 22 05 00 - Plumbing Common Requirements
2. 22 05 10 - Basic Materials and Methods

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 22 05 00. The shop drawings shall indicate the materials used, colors and lettering for all piping and equipment labels. Furnish a complete list of equipment labels to be furnished for the project.

1.4 STANDARDS

- A. Comply with ANSI A13.1 for lettering size, length of color field and viewing angles of identification devices.

PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. Manufacturer shall be Allen Systems, Brimar, Kolbi, W. H. Brady, Industrial Safety Supply or Seton Name Plate.

2.2 PIPE MARKERS

- A. PLASTIC PIPE MARKERS; Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid, snap-on, color coded pipe markers complying with ANSI A13.1.
- B. PLASTIC PIPE MARKERS; Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color coded pressure sensitive vinyl pipe markers complying with ANSI A13.1.
- C. Small Pipes: For external diameters less than 6"(including insulation), provide full band pipe markers, extending 360 degrees around pipe at each location fastened by one of the following methods.
 1. Snap on application of pre-tensioned semi-rigid plastic pipe marker.
 2. Adhesive lap joint in pipe marker overlap.
 3. Laminated or bonded application of pipe marker to pipe or insulation.
 4. Taped to pipe or insulation with color coded plastic adhesive tape at least 2" wide with a full circle at both ends of pipe marker, tape lapped 4".

- D. Large Pipes: For pipe diameters 6" and larger (including insulation), provide either full-band or strip type pipe markers, no narrower than 3 times letter height, and of required length fastened by one of the following methods:
 - 1. Laminated or bonded application of pipe marker to pipe or insulation.
 - 2. Taped to pipe or insulation with color-coded plastic adhesive tape, not less than 2" wide with a full circle at both ends of pipe marker. The tape shall be lapped 4" at both ends.
 - 3. Strapped-to-pipe or insulation application of semi-rigid type with manufacturer's standard stainless steel bands.
- E. Lettering shall be the manufacturer's standard pre-printed nomenclature which best describes the piping system in each instance, or as selected by the engineer in cases of variance with names as shown or specified.
- F. Arrows shall be printed on each pipe marker indicating direction of flow, either integrally with the piping system service lettering or as a separate unit of plastic.
- G. Plastic tape shall be manufacturer's standard color coded pressure sensitive vinyl tape not less than 3 mils thick. Tape for pipe with outside diameters (including insulation) less than 6" shall be 1-1/2" wide. Tape for larger pipes shall be 2-1/2" wide.
- H. Stencils: Minimum 1 inch high lettering and arrows. One coat of dark enamel against a light background or one coat of white enamel against a dark background.

2.3 VALVE TAGS

- A. Brass valve tags shall be 18 gauge with stamp engraved piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high. Tags shall be 1-1/2" high. The tag engraving shall be filled with black enamel. Valve tag fasteners shall be the manufacturer's solid brass chain or solid brass S-hooks manufactured specifically for the connection of tags. Circuit setters shall be furnished with brass or plastic tags listing equipment tag and rating.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Where identification is to be applied to surfaces requiring insulation, painting or other covering; the identification shall be installed after completion of the painting and insulating.
- B. Any identification referencing a room name or number shall not use the room name and number listed on the project drawings as these names and numbers are for reference only. The Architect, Owner and Contractors shall coordinate all room names and numbers to be used on any identification.

3.2 INSTALLATION

- A. Pipe stencils or markers shall be installed on each system including arrows to indicate the direction of flow. Locate pipe markers and color bands or stencils as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces, plenums and exterior locations.
1. Near each valve and control device.
 2. Near each branch, excluding short take-offs for fixtures and terminal units.
 3. Where pipes pass through walls floors or ceilings.
 4. Near major items and other points of origination and termination.
 5. Spaced intermediately along pipe runs at a maximum distance of 50', reduce spacing to 25' in congested areas of piping and equipment.
 6. On piping above lay-in ceilings.
- B. Valve tags shall be provided on all valves, cocks and control devices in each piping system; exclude plumbing fixture valves and shut off valves at plumbing equipment.

END OF SECTION 22 05 53

SECTION 22 07 00 - PLUMBING INSULATION**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. All piping on the project shall be insulated as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings
 - 4. 22 05 23 - Valves
 - 5. 22 05 29 - Pipe Supports and Anchors

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 22 05 00. Include shop drawings for each type of insulation and duct liner to be used on the project.

1.4 QUALITY ASSURANCE

- A. All covering and insulation materials used on this project shall have the manufacturer's name on the container. All materials must be dry and in good condition.
- B. All materials shall have composite fire and smoke hazard ratings as tested by procedures ASTM E-84, NFPA 255 and U.L. 723 not to exceed 25 flame spread and 50 smoke developed.

PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. Insulation materials shall be as listed, or approved equal.

2.2 MATERIALS

- A. Fiberglass pipe insulation shall be Johns Manville Micro-Lok fiberglass pipe insulation with factory applied all-service jacket. Insulation shall be rated for use between -20°F and 850°F. Insulation shall have a maximum flame spread rating of 25 and a maximum smoke rating of 50. The all service jacket shall be furnished with self sealing lap. Thermal conductivity shall be 0.22 BTU-in/hr., SF, °F at 100°F mean temperature. All end joints shall be sealed with 3" wide butt strips of materials identical to pipe covering jackets. Owens Corning SSL and Knauf 1000° shall be accepted as equal.

PART 3 - EXECUTION**3.1 PIPE INSULATION**

- A. Insulation Thickness: The following systems shall be insulated with the following thickness of fiberglass insulation:
1. Domestic Hot Water and Recirculated Hot Water
 - a. 1/2" to 1" = 1"
 - b. 1-1/4" to 2" = 1"
 - c. 2-1/2" and Larger = 1-1/2"
 2. Domestic Cold Water
 - a. 1/2" to 1" = 1"
 - b. 1-1/4" to 2" = 1"
 - c. 2-1/2" and Larger = 1"
 3. Domestic Tempered Water
 - a. 1/2" to 1" = 1"
 - b. 1-1/4" to 2" = 1"
 - c. 2-1/2" and Larger = 1"
 4. Sanitary Sewer and Vent Pipe Above Floor
 - a. 1/2" to 1" = 1"
 - b. 1-1/4" to 2" = 1"
 - c. 2-1/2" and Larger = 1"
- B. Installation
1. All valves, fittings and all other specialties in the piping shall be insulated per the requirements of the system they serve.
 2. Only the pump body and not the motor shall be covered on all pumps.
 3. All pipe insulation shall be installed in accordance with the manufacturer's instructions. All longitudinal joints shall be sealed with factory applied self-sealing laps. All end joints shall be sealed with 3" wide butt strips of materials identical to pipe covering jackets, using adhesive such as Benjamin Foster 30-35 or self-sealing jacket. No stapling shall be permitted on any vapor barrier jackets. No vapor barrier work or self-sealing laps or lap work shall be performed when temperatures are below 40°F.
 4. Insulate all fittings, valves, flanges and strainers with mitered segments of pipe insulation wired in place. Coat each fitting with two 1/8" coats of an approved vapor barrier mastic such as Benjamin Foster 30-35. Reinforce each fitting by wrapping with glass fabric cloth extending 2" onto adjacent pipes and finish with an additional coating of mastic worked into mesh of cloth to provide a smooth finish. Cover with 6 ounce canvas cover in all exposed areas. At the contractors option, pre-molded plastic fitting covers may be used if taped and sealed and

- completely filled with insulation. A continuous vapor barrier must be maintained on all cold piping systems. Corner beads shall be used on all square corners.
5. A continuous vapor barrier shall be maintained on all domestic cold water and rain water piping systems. All pipe hangers on these systems shall be installed outside the insulation with insulation shields installed to protect the insulation. Any damage to the vapor barrier shall be repaired with an approved vapor barrier mastic.
 6. All fiberglass insulation exposed to outdoor weather conditions shall be additionally covered with a 20 mil PVC jacket sealed water tight.
 7. All fiberglass insulation exposed in occupied areas within 9 feet of the floor shall be covered with a PVC jacket. PVC jacket shall not exceed 25 flame spread and 50 smoke developed ratings. Jacket shall be Prato "LoSmoke" PVC or equal.
 8. Insulation shields shall be installed between insulation and pipe hangers. Shields shall be of sufficient size to prevent damage to the insulation.
 9. The cold water main from the building entrance to the meter shall be insulated.

END OF SECTION 22 07 00

SECTION 22 11 10 - PLUMBING PIPES AND PIPE FITTINGS**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Furnish and install where shown on the drawings and required to connect fixtures and equipment, pipe and fittings of type and material for the various services as noted below.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
1. 22 05 00 - Plumbing Common Requirements
 2. 22 05 10 - Basic Materials and Methods
 3. 22 05 11 - Plumbing Firestopping
 4. 22 05 23 - Valves
 5. 22 05 29 - Pipe Supports and Anchors
 6. 22 07 00 - Plumbing Insulation

1.3 SUBMITTALS

- A. Submit shop drawings in accordance with Section 22 05 00. Indicate ASTM or ANSI ratings, pipe and fitting weights, pressure and temperature classifications and joining methods for all types of piping used in the project.

PART 2 - PRODUCTS**2.1 DOMESTIC WATER PIPING**

- A. Domestic cold and hot water pipe in building above floor shall be type L, ASTM B88, hard drawn copper tubing. Fittings shall be wrought copper solder type ANSI B16.22. Joints for pipe and fittings shall be made with non-corrosive flux and 95-5 solder. The maximum lead content of the flux and solder shall be 0.2% by volume. Viega Pro-Press and Nibco Press-Fit may be used in lieu of soldered fittings.
- B. Domestic cold water and hot water pipe in building below floor shall be type K, ASTM B88, soft drawn copper tubing. Fittings shall be McDonald copper flare fittings or equal.

2.2 SANITARY SEWER, ROOF DRAIN AND VENT PIPE

- A. Below Floor: Sanitary sewer, roof drain and vent piping in building below floor to 5' outside building shall be as follows:
1. PVC-DWV, Schedule 40, ASTM D2665-85 pipe and fittings. Join pipe using primer meeting ASTM F656-80 and solvent cement meeting ASTM D2564-80. PVC pipe shall begin below floor, no PVC pipe shall be used in wall or ceiling cavities.
 2. Solvent Cement and Adhesive Primer:
 - a. Use PVC solvent cement that has a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

- b. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Soil, waste, roof drain and vent piping in building above floor shall be as follows:
 1. PVC-DWV, Schedule 40, ASTM D2665-85 pipe and fittings. Join pipe using primer meeting ASTM F656-80 and solvent cement meeting ASTM D2564-80.
 2. Solvent Cement and Adhesive Primer:
 - a. Use PVC solvent cement that has a VOC content of 510 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - b. Use adhesive primer that has a VOC content of 550 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All pipes shall be round and straight, of required size. Cutting shall be done with proper tools and pipes shall be reamed to full size after cutting.
- B. Piping shall be properly enclosed, supported, guided, anchored, sway braced, connected, tested, cleaned and flushed out and shall be properly insulated and protected where required.
- C. Pipe sizes shown on the drawings are nominal pipe sizes and not outside diameters unless noted otherwise.
- D. Pipes shall be run substantially as indicated on the drawings. However, the architect/engineer reserves the right to require this Contractor to make minor changes in pipe locations where conflicts occur with other trades. Such changes shall be made without extra cost to the Owner.
- E. Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Such provision shall be made by means of piping offsets, changes in direction, expansion loops and/or suitable expansion joints. Suitable anchors and guides shall be provided to permit proper deflection and compression of offset loops and expansion joints. Expansion joints shall not be used in lieu of offsets, changes in direction or loops, except where specified and/or indicated on the drawings or where otherwise obviously necessary.
- F. Pipes shall be installed as close to the center of the framing as possible. Piping penetrating a framing member to within 1-1/2 inch of the exposed framing shall be protected by steel nail plate not less than 18 gauge in thickness. The steel plate shall extend along the framing member not less than one and one-half inch beyond the outside diameter of the pipe for a vertical pipe. This includes top and bottom plate protection. Horizontal piping running through studs shall be protected with a stud shoe installed on the front and both sides of the stud. The stud shoe shall be a minimum of one and one-half inch wide and fastened to each stud on the front and both sides with not less than 16d nails. In bearing walls a stud may be cut to a depth not exceeding 40 percent of the width. In non-loadbearing stud the hole may not exceed 60 percent of the width. In no

case shall the hole be nearer than 5/8" to the edge of the stud. Refer to UPC 313.9 and IBC 2308.9.10 and 2308.9.11.

- G. All pipes shall be run with proper grade to provide for easy draining and in group runs where applicable and in a neat and orderly manner, to the satisfaction of Architect/Engineer. Lines required to be enclosed in ceiling, chase ways or spaces shall be installed to permit such enclosure as intended. All pipe runs shall be carefully laid out and scheduled to avoid unnecessary interferences with other work.
- H. Minimum grade for horizontal drainage piping shall be 1/4 inch per foot for 3 inch diameter piping or less, 1/8 inch per foot for 4 inch and larger piping. Install all roof drain piping at 1/8 inch per foot.
- I. The Engineer shall field inspect all underground piping prior to backfilling and compaction of trenches.
- J. Dielectric unions shall be installed at each piping joint between ferrous and non-ferrous piping and joints between dissimilar metals. Comply with manufacturer's installation instructions. Provide standard products recommended by manufacturer for use in service indicated, which effectively isolate piping (electric conductance), prevent galvanic action and stop corrosion. Provide Watts series 3000 or equal.
- K. At all fixture connections where nipples are necessary between copper tubing and fixtures, such nipples shall be standard weight full iron size chrome plated brass pipe nipples with suitable brass or copper adapters. Steel or iron nipples will not be permitted in any location in copper lines where connections are made to brass fixtures valves or trim.

3.2 TESTS

- A. Piping shall be tested as outlined in Section 22 05 00.

END OF SECTION 22 11 10

SECTION 22 40 00 - PLUMBING FIXTURES AND EQUIPMENT**PART 1 - GENERAL****1.1 SUMMARY**

- A. The work involved in this specification and the accompanying drawings consists of performing all labor and furnishing of all materials, fixtures and equipment necessary to install complete sanitary sewer systems and potable hot and cold water systems, as described herein and/or shown on the drawings. This includes all piping, wiring and materials obviously necessary for complete systems though not specifically mentioned or shown.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings

1.3 MANUFACTURERS AND SELECTION

- A. Water closets, urinals and lavatories shall be Kohler, American Standard, Gerber or Zurn.
- B. Stainless steel sinks shall be Just or Elkay.
- C. Manual faucets shall be Delta, Zurn, Moen or Chicago Faucet.
- D. Sensor operated faucets shall be Delta or Zurn.
- E. Electric water coolers and drinking fountains shall be Elkay, Oasis, Acorn, Halsey Taylor or Haws.
- F. Drainage specialties shall be Zurn, Wade, Mifab, Watts, Josam or J.R. Smith.
- G. Flush valves shall be Zurn or Sloan Royal.
- H. Showers shall be Bradley or Acorn.
- I. Lavatory systems shall be Bradley, Acorn, Willoughby or approved equal.
- J. Toilet seats shall be Bemis, Church, Comfort Seat or approved equal.
- K. Mop sinks shall be Zurn, Mustee or approved equal.
- L. All other fixtures shall be as shown on the plan or approved equal. Models, sizes and capacities shall be as listed on the plumbing schedule on the plans or equivalent from other approved manufacturer.

1.4 SHOP DRAWINGS

- A. Submit shop drawings on all plumbing fixtures and equipment including gas regulators. Each item shall be clearly labeled as designated on the plans. The drawings shall include unit dimensions and construction specifications. All features specified shall be clearly designated on the shop drawings. Include shop drawings for stops, traps, continuous wastes and p-traps.

1.5 STANDARDS

- A. All fixtures and faucets designated "Handicapped" shall comply with ANSI standard 117.1, buildings and facilities providing accessibility and usability for physically handicapped people.
- B. All fixtures and faucets required shall meet the standards of the Reduction of Lead in Drinking Water Act and SDWA Safe Water Drinking Act pertaining to potable water systems.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Vents Through Roof (VTR)
 - 1. Vent stacks from sewer, soil, waste and drain pipes shall be extended at least 12 inches above the roof. The minimum size of any vent passing through roof shall be 4 inches.
- B. Cleanouts (CO)
 - 1. Brass screw cleanout plugs shall be furnished and installed at the bottom of all soil, waste and storm sewer stacks and at all points where shown on drawings, and where necessary to permit the entire drainage system to be rodded out easily. Cleanouts in pipes 3" and smaller shall be pipe size. Cleanouts in pipe 4" and larger shall be 4". Floor drains located in branch lines on grade shall have cleanouts adjacent to the drains.
 - 2. Floor cleanouts shall be Zurn ZN-1400 cast iron universal cleanout with inside caulk ferrule, brass plug, adjustable housing and round nickel brass secured frame and scoriated tractor cover. The cover shall be provided to accept the floor covering in the location being installed, i.e., synthetic covering, composition tile, terrazzo, etc. Provide carpet markers where needed. All cleanouts installed in floors with waterproof membranes, shall be provided with clamping devices. Cleanouts installed above finished grade shall be installed with a seepage pan of 4 lb. sheet lead at least 3 feet square.
 - 3. Wall cleanouts shall be Zurn ZN-1441 cleanout ferrule with brass plug and round stainless steel secured access cover.
 - 4. Grade cleanouts shall be Zurn ZN-1400 cast iron universal cleanout with inside caulk ferrule, brass plug, adjustable housing and round nickel brass secured frame and scoriated tractor cover. Install flush with finish grade.

C. Floor Drains (FD)

1. Furnish and install floor drains where shown on the drawings and as specified. All floor drains installed in floors with waterproof membranes shall have flashing clamps.
2. Floor drains shall have a 5" diameter polished nickel bronze strainer having a minimum of six square inches free area and flashing clamps. Furnish and install a deep seal trap.
3. Floor drains installed in upper level mechanical rooms shall have a 48" diameter 60 mil EPDM water proof membrane. See detail on plans and refer to membrane roofing section of specifications for membrane manufacturers.

D. Electric Water Cooler

1. Provide units as listed on the schedule and plan. Water system shall be lead free with front push bars.

E. Lavatory System – plug-in infrared sensor (LS-1)

1. Furnish and install lavatory system as shown on the plan and listed in the schedule. Lavatory system shall be Bradley or Acorn. Units shall be constructed of a densified solid surface composed of polyester resin, resistant to stains, impacts and burns. Panels shall be composed of vacuum-formed acrylic laminate. Bowl assembly and pedestals are secured to a 16 gauge stainless steel frame. Color shall be selected by the Architect from manufacturers standard colors. The infrared sensor shall use zone-focused infrared transmitting beams, not exceeding bowl perimeter with a timing turn-off delay of 2-3 seconds. Sensor shall automatically shut-off flow after 30-45 seconds if sensor is covered over. Molded spray head shall be an integral part of bowl module. Standard equipment shall include bowl system, pedestal, stainless steel mounting frame, 110/24 VAC plug-in transformer, p-trap, tailpiece, flexible stainless steel supply connections, thermostatic mixing valve with combination stop, strainer, liquid soap dispenser and check valves. Each nozzle shall deliver 0.5 gpm.

F. Water Hammer Arresters

1. Arresters shall be Zurn Z-1700 series (size specified on drawings) or equal with nesting type bellows contained within casing having sufficient displacement volume to dissipate the calculated kinetic energy generated in the piping system. Both casing and bellows shall be constructed of stabilized type 304 stainless steel. Shock absorbers shall meet P.D.I. Standard WH201 and A.S.S.E. Standard 1010.

G. Lavatory and Kitchen Hand-wash Sink P-Trap Drain

1. P-trap drain and exposed supply pipes shall be insulated with fully molded, Truebro, Handi Lav-Guard model 102 insulation kit, white color. Insulation shall be self-extinguishing. Nylon type fasteners shall be furnished with kit.

PART 3 - EXECUTION**3.1 SYSTEM OF PLUMBING**

- A. The continuous waste and vent method of plumbing shall be installed. Hot, tempered and cold water pipes are to be installed where shown. All water piping in finished areas shall be concealed in joist spaces, above ceilings, and in walls.
- B. Pipes run overhead shall be placed as close to the ceiling as possible, to maintain proper headroom and to present a neat appearance, all consistent with the pitching of pipes for drainage of the systems.
- C. The plumbing work shall be installed in strict accordance with the best plumbing practice, and in accordance with all applicable local, state and national plumbing regulations.

3.2 WASTE, VENT AND WATER CONNECTIONS

- A. All exposed flush, waste and supply pipes at the fixtures shall be chrome-plated brass pipe, iron pipe size. No steel nipples will be allowed. The faucets, stop valves, pop-up wastes, traps, flush valves etc. shall be heavy cast brass chromium plated. Water lines to all individual fixtures, where exposed, shall be equipped with high grade, loose key, quarter-turn, chromium plated brass stop valves model KTSCR19C Brass Craft brass or equal. All chrome plate shall be installed over a nickel plated base. Provide backing at wall to support fixtures. All water closets shall have bolt caps with retainer clips. Groups of fixtures shall be matched. All fixtures which do not have integral traps shall be furnished with 17 gauge chromium plated brass p-traps with cleanouts.
- B. Waste, vent and water supply piping to plumbing fixtures which is not shown on the drawings shall be provided and shall be sized in accordance with the plumbing schedule on the plans. All plumbing fixtures, wastes, and drains shall be vented in accordance with all applicable Local, State and National Plumbing Regulations.
- C. Water Hammer Arresters: Piping shall be installed with proper safeguards to prevent water hammer. This shall be done by providing water hammer arresters in the piping as shown on the plans and diagrams. Water hammer arresters shall be sized as listed on the plans.
- D. Flush handles shall be mounted on the wide side of toilet areas on all handicapped water closets.
- E. Caulk plumbing fixtures to wall and floor. Caulk color to match fixture. Stainless steel sinks and electric water coolers to be caulked with clear caulk.

END OF SECTION 22 40 00

SECTION 23 05 00 - HVAC COMMON REQUIREMENTS**PART 1 - GENERAL****1.1 GENERAL SUPPLEMENTARY AND OTHER CONDITIONS OF THE CONTRACT**

- A. The general, supplementary and other Conditions of the Contract and the General Requirements (Division 1) are hereby made a part of this section.

1.2 INTENT OF PLANS AND SPECIFICATIONS

- A. The plans and specifications contemplate the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the Owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many minute items which may be required by the nature of the systems. The Contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly herein, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. In receiving bids, it will be assumed that each bidder has made a thorough inspection of the conditions and is familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions prior to submitting the bid will not be allowed.

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all state and local codes and ordinances applying to the work specified herein. Attention is directed in particular to the UNIFORM PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL BUILDING CODE AND/OR ANY AUTHORITY HAVING JURISDICTION, and local regulations concerning the specified heating and cooling equipment.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Bidders shall familiarize themselves with local regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

1.4 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

1.5 SUBSTITUTING

- A. Proposals to Contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the Architect/Engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in

type, function, quality of material and assembly and meet the requirements indicated in drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as acceptable equals for quotations and use, approval will be issued in an addendum.

1.6 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer for approval, prior to the placing of orders for any equipment, complete shop drawings of HVAC equipment and fixtures to be installed. The shop drawings shall include product specifications, cut sheets, diagrams, shop drawings, performance curves or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. The shop drawings shall list the operating conditions of the equipment at the conditions listed on the schedules. Provide shop drawings in electronic 'PDF' format suitable for use on Submittal Exchange or similar program.
- B. All shop drawings shall be submitted by the Contractor and shall have been signed, "approved" and initialed by the Contractor prior to submittal to the Engineer. The Engineer will check the shop drawings to aid in interpreting the plans and specifications, and in so doing will assume that the shop drawings conform to all specified requirements set forth in this specification. The approval of the shop drawings by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the specification.
- C. The determination of quantities of material and equipment required shall be made by the Contractor from the drawings. Schedules on the drawings and in the specification are completed as an aid to the Contractor, but where discrepancies arise, it shall not release the Contractor from providing the proper number to complete this work.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 ALL EQUIPMENT FURNISHED UNDER DIVISION 23

- A. At a time set by the Contractor and agreed to by the Owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the Owner.
- B. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.

- C. Run operating test for 30 hour periods and submit data for approval.
- D. All equipment shall be charged with clean media and installation completely finished prior to acceptance.
- E. Properly balance all air systems. The CFM of all diffusers shall be balanced to within 10% of the CFM listed on the schedule. Submit a report listing the initial and final CFM at each diffuser and the total CFM of each furnace. Balance the outside and return air dampers to provide the minimum outside air listed on the schedule during the occupied cycle.

3.2 OPERATION AND MAINTENANCE MANUALS

- A. Prepare a portfolio with a complete set of shop drawings of the equipment used in the erection of the HVAC systems and equipment testing, cleaning and maintenance instructions, operation and maintenance manuals, list of materials for the maintenance, parts list, wiring diagrams, and name and address of authorized service organization.
- B. Information shall be folded only if necessary, and bound in an 8-1/2" x 11" hard cover indexed, loose-leaf binder. Multiple binders shall be used if required to contain material. All material shall be properly identified with job name, date, and the names and addresses of the Contractor, Architect, and Engineer. Provide manuals in electronic 'PDF' format in addition to the printed copies.
- C. The portfolio shall be submitted to the Engineer for review of material and completeness prior to final inspection, and when approved by the Engineer, the portfolios shall be turned over to the Owner.

3.3 PROJECT CLOSE OUT

- A. The HVAC Contractor shall arrange for an inspection of all items installed in the ceiling before the ceiling or ceiling tile is installed. The Engineer shall be informed at least one week before the planned installation of the ceiling to arrange the inspection. If the ceiling tile is installed before the inspection, the HVAC Contractor shall remove all the ceiling tiles prior to the inspection.
- B. General: Refer to Division 1 sections for general closeout requirements. Maintain a daily log of operational data on HVAC equipment and systems throughout the closeout period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Engineer.
- C. Record Drawings: Give special attention to the complete and accurate recording of underground conduit, piping and concealed and non-accessible work, branching arrangement and valve location of all piping systems, location of dampers and coils in duct systems, locations of control system sensors and other control devices, and work of change orders where not shown on contract documents.
- D. Closeout Equipment/Systems Operations: Sequence operations properly so that work of the project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment with the Owner's operating personnel present to demonstrate sustained, satisfactory performance. Adjust and correct

operations as needed for proper operation. Clean and lubricate each system, and replace dirty filters, excessively worn parts and similar expendable parts of the system.

- E. Operating Instructions: Conduct at least a full day walkthrough instruction seminar for the Owner's personnel to be involved in the operation and maintenance of the HVAC equipment and systems. If more time is needed the Contractor shall continue instruction until the Owner's personnel are familiar with the operation of the system. Explain the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the system.
 - 1. Provide written verification that operating instructions have been provided, signed off by an Owner's Representative.
- F. Turn-Over of Operation: At the time of substantial completion, turn over the prime responsibility for the operation of the system to the Owner's personnel. However until the time of final acceptance, provide at least one full-time operating technician, who is completely familiar with the work, to consult with and continue training the Owner's personnel. Additional training shall take place as specified in other sections.
- G. Final Payment will not be made until the Contractor has satisfactorily completed all final inspection items.
- H. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The Contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. The Owner has the right to order repairs to any equipment or work provided hereon and to charge the Contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

END OF SECTION 23 05 00

SECTION 23 05 10 - BASIC MATERIALS AND METHODS**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. All work done under Division 23 shall be in accordance with the requirements of this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following section shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements

1.3 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 23 05 00.
- B. Submit shop drawings for pipe cleaning compound.

PART 2 – (NOT APPLICABLE)**PART 3 - EXECUTION****3.1 INSTALLATION OF THE WORK**

- A. The Contractor shall examine all the drawings before proceeding with the layout and installation of his work. General, plumbing and electrical wiring contract drawings will be made available to this Contractor. SHOULD DISCREPANCIES AFFECTING THE WORK BE FOUND, THE CONTRACTOR SHALL IMMEDIATELY REPORT SAME TO THE ENGINEER FOR INSTRUCTIONS. Subsequent changes made necessary by the neglect of any Contractor to discover and report such discrepancies shall be made by and at the expense of the Contractor, under the direction of the Engineer.
- B. Furnish, provide, and/or install shall be considered as requiring the Contractor to both furnish the equipment and install it unless specific reference is made to the furnishing or installing of the equipment by others.
- C. The Contractor shall confer and cooperate with other Contractors on the job in the installation of his work so all work will be installed in proper relationship to the surrounding location and shape of any part to avoid conflicts. The Contractor shall be responsible for the correct size and location of any changes, slots, and openings required by him and shall be required to do, at his expense, any cutting or patching made necessary by his failure to make proper arrangements in this respect.
- D. Pipes and ducts shall be located essentially as shown on the drawings, but in exact locations as laid out by the Contractor on the job to suit actual conditions. Exposed pipes and ducts shall be arranged as closely as practical to wall or ceiling surfaces. Indicated connections to equipment are necessarily based on equipment of a given manufacturer. If the Contractor proposes to use "approved equal" equipment, then it shall be

understood that the Contractor shall assume the responsibility for proper location in a manner approved by the Engineer. Changes made necessary for this reason will be made by, and at the expense of this Contractor.

- E. The Contractor shall follow the equipment manufacturer's instructions and recommendations in the installation and connection of all equipment and materials furnished under this contract. In the event of conflict or discrepancy between manufacturer's instructions and the contract documents, the Contractor shall notify the Engineer before proceeding. No equipment installation shall be made in a manner that voids the manufacturer's warranty of the equipment.
- F. Any hazardous waste or asbestos required to be removed, encapsulated or otherwise contained during the course of this project shall be performed by the Owner. E.D.A. Inc. shall be indemnified from any and all liability associated with the removal, encapsulation or containment of hazardous waste or asbestos.

3.2 PROTECTION AND CLEANING OF HVAC SYSTEMS

- A. All duct, piping and equipment shall be kept clean at all times, refer to specific specification sections for additional requirements. Air handling units, fan coil units, etc. shall be protected from weather, dust-producing procedures, or damage. Take immediate measures to dry any equipment that becomes wet. If any mold growth develops on equipment because Contractor did not protect or dry the equipment, Contractor shall remediate the equipment following procedures approved by MCPS.
- B. Duct systems, air-handling units, fan coil units, etc. shall be protected from construction dust and debris by sealing outlets and openings with 6-mil plastic sheeting. Stand-alone units (e.g., fan coil units) shall be wrapped with 6 mil plastic and sealed with tape.
- C. HVAC equipment shall not be operated during construction without Engineers approval. If HVAC equipment is operated in construction areas, filters having a minimum efficiency of 30% (atmospheric duct spot efficiency test) or MERV 6 rating shall be installed on return air openings. Filters shall be changed every two weeks at the General Contractors expense.
- D. If duct or equipment becomes dirty during construction, clean the duct following National Air Duct Cleaning Association (NADCA) procedures.
- E. Work shall comply with recommendations of the SMACNA IAQ Guidelines for Occupied Buildings Under Construction.

3.3 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. If installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated, suitable allowances shall be made by the equipment supplier and/or Contractor.

3.4 RECORD DRAWING

- A. The Architect will furnish the Contractor 1 set of the mechanical drawings as issued for this contract. The Contractor shall use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At the completion of the job the drawings shall be delivered to the Engineer for a permanent record of the exact location of all equipment, pipe runs, etc., as incorporated in the job.

3.5 CLEANING

- A. At the conclusion of construction work, the entire system of heating and cooling equipment shall be cleaned prior to acceptance of the building.
- B. Labels, stickers, etc., shall be removed and the entire installation left in a clean, usable condition.
- C. Heating and cooling equipment, tanks, heat exchangers, pumps, traps, duct, etc., shall be thoroughly cleaned and new filters or filter media installed.

3.6 PAINTING

- A. Finishes of all mechanical equipment shall be protected during storage, installation and until final acceptance. Any damage or imperfections shall be "touched up" or if extensive, the entire unit shall be repainted as directed by the Engineer.

3.7 SLEEVES

- A. The HVAC Contractor shall set and maintain all sleeves. Any pipe passing through building construction including walls, floors, roofs or masonry partitions shall be encompassed with sleeves in accordance with the following.
- B. All pipe sleeves through slabs, floors, masonry walls and partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.
- C. Sleeves shall be schedule 40 steel pipe. Wall sleeves shall be flush with the wall surface. The top of floor sleeves shall extend 1" above the floor, the bottom of the sleeve shall be flush with the underside of the floor.
- D. The space between the pipe and the sleeves, through fire rated walls and floors shall be protected as designated in Section 23 05 11.
- E. Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. The wall plates shall have set screws or spring locks for clamping to the pipe.
- F. All pipes through sound rated walls or walls which run up to the deck above shall be sealed to prevent sound transmission and maintain the wall's sound rating.

3.8 OPENINGS

- A. The inside dimensions of all openings shall be 1/2 inch greater than the size of the ductwork or equipment passing through the opening. Openings for insulated ductwork shall be large enough to accommodate the insulation without harming the insulation or vapor barrier.
- B. All openings through fire rated walls and floors shall be protected as designated in Section 23 05 11.
- C. Provide a sheet metal trim angle for all exposed ducts where they pass through walls, floors or ceilings in finished areas. The trim angle shall completely cover the space between the duct and the wall, floor or ceiling.
- D. All ducts through sound rated walls or walls which run up to the deck above shall be sealed to prevent sound transmission and maintain the walls sound rating.

3.9 EXISTING SERVICES

- A. The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.
- B. All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of service if possible.
- C. All inactive services which are encountered shall be protected, or removed as directed by the Owner, Utility Company, or Municipal Agency having jurisdiction.
- D. When active services must be temporarily interrupted, arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

3.10 ACCESS TO EQUIPMENT

- A. Access shall be provided to all motors, valves, dampers, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The General Contractor will provide access panels and doors required in the building construction where shown on the plans. The location of the access openings relative to the HVAC equipment shall be coordinated to assure proper access to the equipment.
- B. All access openings required for manual, motorized, fire and smoke dampers and other devices requiring access shall be provided in the ductwork, plenums, housings, tanks, etc., under this portion of the contract.

3.11 PROTECTIVE DEVICES

- A. All sheaves, belts, drives, couplings, and moving parts shall be protected by OSHA approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

END OF SECTION 23 05 10

SECTION 23 05 13 - ELECTRICAL PROVISIONS OF HVAC WORK**PART 1 - GENERAL****1.1 ELECTRIC MOTORS**

- A. All electric motor driven equipment being furnished and installed under these specifications shall be complete with electric motors, unless specified otherwise. Bearings shall be ball type with lubricating fittings extended to an easily accessible location for field servicing. Minimum service factors for all motors shall be 1.15. All motors shall conform to applicable NEMA Standards, and shall bear the stamp of approval of the Underwriters Laboratories. All motors, except direct connected motors, shall be furnished complete with cast iron or stamped steel adjustable slide rails. Single phase motors shall be capacitor start type, open drip proof, unless specified otherwise.
- B. Horsepower Rating: All electric motors shall be sized to meet the horsepower requirements of the driven unit at design characteristics including all V-belt and/or drive and coupling losses which are incurred without loading the motor beyond its nameplate horsepower rating. Where V-belt drives are employed, the motor horsepower nameplate rating shall not be less than 120 percent of the driven unit brake horsepower requirements.
- C. Single Phase Motors: Unless specifically noted otherwise, all electric motors shall be designed for operation in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on drawings or specified, 60 cycle alternating current. Motors shall be thermally protected.
- D. Three Phase Motors: All electric motors shall be designed for operating at an ambient temperature not exceeding 40 degrees C, continuous duty and shall be designed for use with voltage as scheduled on drawings or specified, 60 cycle alternating current. All three phase motors shall be premium efficiency type.
- E. Inverter Fed Motors: All motors connected to a variable frequency drive shall meet the requirements of NEMA, MG1, Part 31.4.4.2 for Inverter Driven Motors. Motors shall be furnished with shaft grounding rings.

1.2 MOTOR STARTERS

- A. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications, all motor starters will be furnished and installed by the Electrical Contractor.

1.3 ELECTRICAL WIRING

- A. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications, all electric wiring shall be furnished and installed by the Electrical Contractor. The Electrical Contractor will make one power connection to each item of HVAC equipment, unless specified otherwise.

- B. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications all disconnects shall be furnished and installed by the Electrical Contractor.
- C. All control wiring and controls as noted on the drawings and/or as specified in these specifications shall be furnished and installed by this Contractor, unless specifically noted otherwise.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify proper motor rotation at equipment startup.

END OF SECTION 23 05 13

SECTION 23 05 14 - DEMOLITION

PART 1 - GENERAL

1.1 GENERAL DEMOLITION

- A. Extent of demolition shall be as shown on the drawing.
- B. All items which the Owner does not wish to retain shall be removed and disposed of off site.
- C. SUBMIT PROPOSED SCHEDULE OF WORK TO ARCHITECT AND OWNER FOR REVIEW PRIOR TO START OF WORK. INCLUDE IN SCHEDULE COORDINATION FOR SHUT-OFF CAPPING AND CONTINUATION OF UTILITIES.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXECUTION PROCEDURE

- A. Demolish in an orderly and careful manner as required to accommodate new work. Protect existing supporting structural members.
- B. Repair all demolition performed in excess of that required at no cost to the Owner.
- C. Cap all pipes below floor or above ceiling. Remove all excess pipes and ducts.
- D. All items to be retained by Owner shall be carefully removed and stored as directed by the Owner.
- E. Remove from site and dispose of off site all debris, rubbish, and all other items which the Owner does not retain.

END OF SECTION 23 05 14

SECTION 23 07 03 - FIBERGLASS HVAC DUCT INSULATION**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. All ductwork on the project shall be insulated as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 31 10 - Duct

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
 - 1. Provide product description, list of materials and thickness for each device and location.
 - 2. Submit a complete copy of the manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- A. All covering and insulation materials used on this project shall have the manufacturer's name on the container. All materials must be dry and in good condition.
- B. All materials shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255 and U.L. 723 not to exceed 25 flame spread and 50 smoke developed. All accessories shall have the same component ratings so that the complete installation meet these standards.
- C. Insulation shall be applied by qualified personnel skilled in this trade. Insulation shall not be installed until surfaces are clean, dry and free of dirt, dust, grease and other extraneous elements.

PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. Insulation materials shall be as listed, or approved equal.

2.2 MATERIALS

- A. Internal duct insulation shall be Certainteed Tough Gard duct liner with Certa edge coat. The glass fiber duct liner shall be ASTM C1071, Type I, have a minimum NRC value for 1 inch thickness of 0.6 and a maximum thermal conductivity (k) at 75°F of 0.28. The duct liner shall comply with NFPA 90A and 90B. The liner shall have a coated, composite, abrasion resistant air stream surface. The liner shall have a factory applied

edge coating which complies with SMACNA installation standards. The liner shall be treated with an EPA registered biocide and shall have no fungi growth per ASTM C665 and G21 and no bacterial growth per ASTM G22 test methods. The liner shall be suitable for use with duct velocities up to 6000 fpm. Metal nosings shall be used on upstream transverse edges where duct velocities exceed 4000 fpm. Approved mechanical fasteners shall be used which compress the liner no more than 10%. Knauf, Johns Manville, Owens Corning and Anco System 7000 shall be accepted as equal.

- B. Rigid external duct insulation shall be Certainteed CB 300 rigid insulation board with Foil-skrim-kraft facing. Insulation shall be wrapped tightly on the duct with all joints butted. Adhere adhesive at 8" on center. Additionally secure insulation to the bottom of rectangular duct over 24" wide with mechanical joints. Cover all joints with Foil Reinforced Kraft tape. Install insulation in accordance with manufacturer's recommendations. Knauf, Owens Corning and Johns Manville shall be accepted as equal.
- C. Flexible external duct insulation shall be Certainteed standard flexible duct wrap, 1 pound density, FSK facing, with a k-value of 0.26 at 75°F mean temperature. Insulation shall have a nominal thickness of 1-1/2" with an average installed thickness of 1-1/8". Knauf, Owens Corning and Johns Manville shall be accepted as equal.

PART 3 - EXECUTION

3.1 APPLICATION

- A. The following systems shall be insulated with 1" thick internal duct insulation:
 - 1. Low pressure rectangular supply duct.
 - 2. Rectangular return duct.
 - 3. Rectangular transfer duct.
- B. The following systems shall be insulated with 1-1/2" thick flexible external duct insulation:
 - 1. Low pressure round supply duct.
 - 2. Round exhaust and relief air duct within 10 lineal feet of the building exterior.
 - 3. Round outside air duct.
 - 4. Round combustion air duct.
- C. The following systems shall be insulated with 2" thick rigid external duct insulation:
 - 1. Rectangular exhaust and relief air duct within 10 lineal feet of the building exterior.
 - 2. Rectangular outside air and mixed air duct.
 - 3. Rectangular combustion air duct.
 - 4. Drip pans and ducts through roof or side walls.

3.2 DUCT LINER

- A. Duct sizes shown on the drawings are net interior dimensions. Overall duct sizes shall be increased to accommodate the insulation.

- B. Install liner as specified in the SMACNA HVAC Duct Construction Standard and the manufacturer's written instructions. Liner shall be installed with the coated side towards the air stream. Adhere liner to all sides of the duct with 100 percent coverage of an approved fire resistant insulation bonding adhesive. When the duct height or width exceeds 8", mechanically attach liner to duct as specified in the SMACNA HVAC Duct Construction Standard. Install metal nosings as required in the SMACNA Standards based on the velocity present in the duct. "Butter" all raw exposed edges with adhesive. The fabricated duct sections shall be kept clean and dry from fabrication through job completion. Any liner or duct which becomes wet or dirty shall be replaced with new duct.

3.3 EXTERNAL RIGID DUCT INSULATION

- A. The insulation shall be attached tightly to the duct with all joints butted. The insulation shall be applied to the duct by impaling over welded pins or studs and securing with washers or clips. All joints shall be taped to insure a continuous vapor barrier. Rub pressure sensitive tapes with a nylon sealing tool to assure a positive bond. Apply only if temperature is between 35° and 100°F. Pins or studs shall be spaced a maximum of 16" on center. Pins shall be within 4" of the insulation edge. Cover all pins and studs with a matching vapor barrier patch. Coat all taped seams and patches with two 1/8 coats of an approved vapor barrier mastic such as Benjamin Foster 30-35.

3.4 EXTERNAL FLEXIBLE DUCT WRAP INSULATION

- A. Adhere insulation to duct with fire retardant adhesive. Insulation shall be butted with facing overlapped a minimum of 2". All joints shall be sealed and taped with FSK backed tape to maintain a complete vapor barrier. Complete installation shall be in accordance with the manufacturer's installation instructions.

END OF SECTION 23 07 03

SECTION 23 31 10 - DUCT**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Rigid and Flexible duct.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 11 - HVAC Firestopping
 - 4. 23 05 48 - Vibration Isolation
 - 5. 23 07 03 - Fiberglass HVAC Duct Insulation
 - 6. 23 33 00 - Duct Accessories

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Submit shop drawings on all manufactured spiral duct and flexible fiberglass duct.
- C. Indicate on drawings duct construction, type and construction of fittings and metal gauges. Indicate velocity ratings, pressure ratings and UL listing for flexible duct.

1.4 QUALITY ASSURANCE

- A. All duct shall be constructed and installed in accordance with the latest HVAC Duct Construction Standards, published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. All duct materials and construction shall meet the requirements of NFPA 90A of the latest issue, and the International Mechanical Code of the latest issue.

PART 2 - PRODUCTS**2.1 LOW PRESSURE DUCT (Static pressure \leq 1" WG positive or negative)**

- A. All duct shall be low pressure duct.
- B. Low pressure rectangular duct shall be G60 galvanized steel fabricated and erected in a workmanlike manner. Fabricate plenums, goosenecks and special fittings, as shown on the drawings, or as required. Where space permits, duct elbows shall be constructed with an inside radius equal to or greater than the duct width. Where space does not permit duct turns as described above, duct turn vanes shall be used.
 - 1. Duct shall be properly braced and reinforced with transverse joints and bracing. Ducts 18" in width and larger shall be cross braced.
 - 2. The minimum metal gauges for above floor low pressure duct shall be as follows:

- a. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Up to 12", Galvanized Sheet Steel Gauge Number 26
 - b. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 13" to 30", Galvanized Sheet Steel Gauge Number 24
 - c. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 31" to 54", Galvanized Sheet Steel Gauge Number 22
 - d. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 55" to 84", Galvanized Sheet Steel Gauge Number 20
 - e. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 85", Galvanized Sheet Steel Gauge Number 18
- C. Round fiber ductwork shall be used for duct runouts to the diffusers. The ductwork shall be Owens Corning fiberglass flexible round duct or equal. The duct shall be UL classified as a Class 1 air duct. The product shall be factory made, insulated round air duct with a reinforced metalized or gray film outer jacket enclosing a 1" thick fiber glass insulation wrapped around a continuous inner air barrier film reinforced with an encapsulated steel wire helix. The round duct system shall have a thermal conductivity of .23 at 75°F mean temperature with a noise reduction coefficient of 0.75 for mounting No. 6. All round ducts shall be recommended by the manufacturer for use indicated and all joints shall be taped with a 1-1/2 inch wide pressure sensitive tape supplied by the duct manufacturer. The tape shall be centered over the joint and end lapped at least 3 inches. Round ductwork shall be supported at all turns and transitions and straight runs at a maximum of 6 feet o.c. where building framing does not provide such support. Support shall be minimum 3/4 inch metal strap suspended from the roof or framing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The contractor shall verify the exact location of ductwork to avoid interference with the work of other trades. Special care shall be taken to avoid interference with piping, conduit, light fixtures etc. Concealed duct shall be installed to allow the installation of the ceilings at the height shown on the plans.
- B. Duct sizes shown on the plan are net interior dimensions. The contractor shall increase the overall duct size to accommodate the insulation.
- C. Flexible connections shall be installed between suction and discharge openings in fan units where shown on plans, to prevent transmission of vibration noises. Material shall be watertight and fire retardant glass fabric approved by Underwriter's Laboratory. The flexible material shall be furnished with all necessary angles, bolts, clips or other fasteners.
- D. All low pressure duct shall be constructed and installed in accordance with the HVAC Duct Construction Standards, as published by SMACNA, for 1" W.G. static pressure positive or negative. Low pressure duct shall be sealed in accordance with Seal Class C as defined in the SMACNA HVAC Duct Construction Standards, 2005.
- E. All ductwork visible through the face of the register or grille shall be painted with a flat black paint.

- F. The bottom 1" of all exhaust and fresh air duct shall be soldered or caulked water tight to prevent the leakage of any condensated water from the duct.
- G. All openings in the duct work which would allow debris to enter the duct shall be covered during construction. The entire ductwork system shall be cleaned of all dust and debris at the conclusion of the construction.
- H. All duct hangers shall be constructed and installed in accordance with the SMACNA HVAC Duct Construction Standards. Duct hangers shall not be attached to the floor or roof decks. Hangers shall be attached to the structural steel construction with joist or beam clamps.
- I. Flexible duct shall be installed in accordance with the manufacturer's instructions and SMACNA installation instructions. The maximum length of flexible duct shall be 8 feet. The minimum length of flexible duct shall be used. The duct shall be supported a maximum of 5' o.c. with a maximum sag of 1/2" per foot. Duct supports shall be a minimum of 1" wide. Bends shall be made with not less than 1 duct diameter centerline radius. The duct shall be installed as high as possible. Provide a minimum of one duct diameter straight duct above diffusers or provide a rigid sheet metal elbow inside the duct where space is limited.

END OF SECTION 23 31 10

SECTION 23 33 00 - DUCT ACCESSORIES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Manual Dampers

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 31 10 - Duct

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Submit shop drawings for manual dampers.
- C. Shop drawings shall include manufacturer's descriptive literature and performance data at actual design conditions.

PART 2 - PRODUCTS

2.1 MANUAL DAMPERS

- A. Furnish and install balancing dampers in the ductwork where shown and wherever required to accurately balance the system. Dampers shall be a minimum of 18 gauge, rigid to prevent vibration and held securely in place at any setting with a heavy lock quadrant. Damper construction shall be approved by the engineer. Volume damper construction shall meet the SMACNA HVAC Duct Construction Standards.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All duct accessories shall be installed in accordance with the latest edition of the SMACNA HVAC Duct Construction Standard and as recommended by the manufacturer.

END OF SECTION 23 33 00

SECTION 23 34 23 - POWER ROOF VENTILATORS (PRV3, PRV4, PRV6 & PRV7)**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Furnish and install Power Roof Ventilators as shown on the plans and listed in the schedule.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 13 - Electrical Provisions of HVAC Work

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Shop drawings shall include all performance data listed in the schedule.
- C. Include manufacturer's descriptive literature.

1.4 STANDARDS

- A. Unit shall be Underwriters Laboratories listed and stamped (UL-705).
- B. Unit shall bear the AMCA Sound and Air Performance seal.

PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. Power roof ventilators shall be as manufactured by Loren Cook with Greenheck accepted as equal.

2.2 CONSTRUCTION

- A. Roof exhaust fans shall be of the centrifugal, direct drive type. Construction of the fan housing shall be of heavy gauge aluminum. All spun parts shall have a rolled bead for added rigidity and shall be specially spun so as to seal the pores of the aluminum providing greater resistance against oxidation and deterioration.
- B. The fan wheel shall be all-aluminum of the centrifugal blower type featuring backward inclined blades and a tapered inlet shroud. Wheels shall be statically and dynamically balanced. Inlet cone shall be aluminum and of the centrifugal blower type. Motor and drives shall be enclosed in a weather-tight compartment, separate from the exhaust airstream. Air for cooling the motor shall be supplied to the motor compartment by way of an air passage, from an area free of contaminated exhaust fumes. Motors shall be of

the heavy duty, permanently lubricated, sealed ball bearing type. Motors shall have built-in thermal overload protection. Motor shall be electronically constructed, rated for continuous duty and furnished with an internally mounted potentiometer speed control. Fan shaft shall be of steel construction, turned, ground and polished to precise tolerances in relationship to the hub and bearings. Bearings shall be flanged and of the permanently lubricated, permanently sealed, ball bearing type capable of at least 200,000 hours L-50 bearing life at maximum cataloged operating speed. The entire drive assembly and wheel shall be removable, as a complete unit, from the support structure without disassembling the external fan housing. The complete drive assembly shall be mounted on rubber vibration isolation.

- C. Units shall be of type B construction and shall carry a one-year warranty. Fans shall be licensed to bear the AMCA ratings seal for air and sound performance.

2.3 ACCESSORIES

- A. Prefabricated roof curb shall be furnished by the unit manufacturer. The curb shall be 12" high, with galvanized steel construction and 2" of thermal/acoustical insulation. Curb shall have wood nailer with 1/4" x 2" rubber pad on top.
- B. A motorized gravity backdraft damper shall be furnished with each unit. The damper shall be of aluminum construction with brass hinge bushings and water proof felt bumpers to reduce noise and insure low leakage. Damper motor shall be wired to fan and open when fan is enabled.
- C. Disconnect switches shall be furnished with each unit. Disconnect switches shall be located on the unit to disconnect unit from power for servicing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The power roof ventilators shall be installed as shown on the plans and as specified herein. Roof curbs shall be installed as recommended by the roofing contractor and as detailed on general construction and HVAC drawings. Provide blocking under the curb so the bottom of the curb can be mounted level with the top of the insulation.
- B. The units shall be installed in accordance with the manufacturer's recommendations.

END OF SECTION 23 34 23

SECTION 23 37 13 - GRILLES, REGISTERS AND DIFFUSERS**PART 1 - GENERAL****1.1 WORK INCLUDED**

- A. Furnish and install grilles, registers and diffusers as shown on the plan and listed on the schedule.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 31 10 - Duct

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Shop drawings shall include all performance data listed in schedule. Include a schedule which lists the model, size, CFM, throw, NC and air pressure drop for each register, grille and diffuser. NC levels shall be based on 125 Hz through 4 KHz octave band sound power levels minus a room absorption of 10 dB, re: 10 pW, per ARI Standard 885-98.
- C. Include manufacturer's descriptive literature for each grille, register and diffuser. Clearly label each model description with the equipment tag from the plan.

PART 2 - PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS**

- A. Model numbers listed on the schedule are Metal-Aire. Equivalent models from Carnes, Krueger, Nailor, Price, Titus and Tuttle & Bailey will be accepted as equal.

2.2 CONSTRUCTION

- A. Provide registers, grilles and diffusers with size, capacity, construction, materials and mounting similar to those listed in the schedule. All units shall be constructed in a neat and workmanlike manner of heavy gauge metal. Finish shall be as listed on the schedule.
- B. Furnish special requirements such as frames, dampers, blank-off baffles, etc as listed on the schedule or designated on the plans.
- C. Furnish neck-mounted dampers only where listed on the schedule. Dampers shall be opposed or radial blade and of heavy duty construction to prevent vibration. Butterfly and sliding dampers are not acceptable.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mount grilles, registers and diffusers as shown on the plan and recommended by the manufacturer.
- B. The exact location of the grilles, registers and diffusers shall be as shown on the Reflected Ceiling Plans.

END OF SECTION 23 37 13

SECTION 26 01 00 - ELECTRICAL COMMON REQUIREMENTS**PART 1 - GENERAL****1.1 GENERAL SUPPLEMENTARY AND OTHER CONDITIONS OF THE CONTRACT**

- A. The general, supplementary and other Conditions of the Contract and the General Requirements (Division 1) are hereby made a part of this section.
- B. Note that the complete electrical installation for this project falls under two specification divisions: Division 26 and Division 28.
- C. The project shall be bid as one complete package with the final electrical construction bid containing all costs for Division 26 and 28. This will result in one "electrical" contract.
- D. The general requirements shown here in this Division 26 section shall also apply to Division 28.
- E. Where M.C. or Mechanical Contractor is referenced in Division 26 or 28 specifications or on the electrical drawings, it refers to the general trade. Coordinate in field with the proper HVAC, Plumbing or Fire Suppression Contractor based on the information in the specification or note.

1.2 INTENT OF PLANS AND SPECIFICATIONS

- A. The intent of the plans and specifications are for the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the Owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many incidental items which may be required by the nature of the systems. The Contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly in the drawings and specifications, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. The Contractor shall make a thorough inspection of the conditions and be familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions will not be allowed.

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all state and local codes and ordinances applying to the work indicated in the drawings and specifications.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Contractors shall familiarize themselves with local regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

1.4 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

1.5 SUBSTITUTING

- A. Proposals to the Engineer from the Contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the Engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in type, function, quality of material and assembly and meet the requirements indicated in the drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as equivalents for quotations and use, approval will be issued in an addendum. Review of proposed submittals will only take place if approval has been obtained and "ample time" is remaining in the addendum phase of the project. The definition of "ample time" required is at the discretion of the registered Engineer.

1.6 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer for review, prior to the placing of orders for any particular equipment, at least six (6) sets of shop drawings of electrical equipment and fixtures to be installed. The shop drawings shall consist of catalog cuts, diagrams, performance data or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. Provide shop drawings in electronic "pdf" form if web based or email submittal methods are used.
- B. The shop drawings shall be bound in a hole punched or spiral bound type folder. Provide cover sheet with job name, name of Contractor, supplier and manufacturer. The cover sheet shall have ample space for Contractor's stamp and Engineer's stamp. If shop drawings for the following systems are required by the plans and specifications, the shop drawings for these systems shall be bound separately in the following categories:
 - 1. Lighting
 - 2. Power Distribution/Devices/Misc. Electrical Equipment
 - 3. Fire Alarm
 - 4. Electrical Fire Stopping
- C. All shop drawings submitted by the Contractor shall be signed "approved" and initialed by the Contractor prior to submittal to the Engineer. The Engineer will review the shop drawings to aid in the Contractor's interpretation of the plans and specifications. In doing so, the Engineer will assume that the shop drawings submitted by the Contractor conform to all specified requirements set forth in the drawings and specifications. The review of

the shop drawings by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the plans and specifications.

- D. In the event that a shop drawing submittal is signed "Resubmit" by the Engineer, the following shall occur:
 - 1. On items that received comment, new catalog cut sheets, diagrams, or performance data shall be provided for the materials in question. The additional information shall fully conform to all comments made by the reviewing Engineer.
 - 2. The entire shop drawing submittal for that category shall be resubmitted.
- E. The determination of quantities of material and equipment required shall be made by the Contractor from the plans, schedules and specifications.
- F. Allow ten (10) working days for Engineer review. Shop drawing submittals to follow the process outlined in Division 1.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 TESTS

- A. Perform tests as specified in other sections.

3.2 SPECIAL SYSTEMS AND EQUIPMENT FURNISHED UNDER DIVISION 26 AND 28

- A. At a time set by the Contractor and agreed to by the Owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the Owner.
- B. Where indicated in the specification, provide the services of a factory trained representative to instruct the Owner's authorized personnel in the operation, control, and maintenance of equipment. Contractor shall instruct Owner's personnel in the operation of all other equipment and systems.
- C. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.
- D. Any fuel source used in the testing of special systems shall be the responsibility of the Contractor.

3.3 OPERATION AND MAINTENANCE MANUALS

- A. Prepare two portfolios with two complete sets of shop drawings of the equipment used in the electrical systems, cleaning and maintenance instructions, operation and maintenance manuals, list of materials for the maintenance, parts list, wiring diagrams, testing reports, warranties, certifications, and name and address of authorized service organization(s).

- B. Information shall be folded only if necessary, and bound in an 8-1/2" x 11" hard cover indexed, loose-leaf binder. Multiple binders shall be used if required to contain material. All material shall be properly identified with job name, date, and the names and addresses of the Contractor, Architect, and Engineer.
- C. The portfolios shall be submitted to the Engineer for review of material and completeness prior to final observation, and when approved by the Engineer, the portfolios will be turned over to the Owner at the time of the final observation.
- D. Provide a copy of the final panelboard schedules (updated with any changes from addendum, revisions and change orders) in each set of the operation and maintenance manuals. Copies of panel schedules are to be provided in the operation and maintenance manuals in case circuit directories in the panelboards are lost.

3.4 CLEANING

- A. On completion of installation, including outlets, fittings, boxes, raceways and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes and cabinets are without damage or deterioration at time of substantial completion.
- C. For wall mounted devices, internally clean devices, device outlet boxes and enclosures. Replace stained or improperly painted wall plates or devices.
- D. For enclosures, inspect interior and exterior of enclosure. Remove paint splatters and other spots. Vacuum dirt and debris, do not use compressed air to assist in cleaning. Repair exposed surfaces to match original surface.

3.5 PROJECT CLOSE OUT

- A. Refer to Division 1 sections for general close-out requirements.
- B. Record Drawings: Give special attention to the complete, accurate and legible recording of underground conduit, work of change orders, field changes, other undocumented changes, and panel schedule changes where not shown on contract documents. Record Drawings are for future reference and/or for CAD updates per Owners request.
- C. Final Payment will not be made until the Contractor has satisfactorily completed all final observation/punch-list items.
- D. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The Contractor is to extend warranty based on substantial completion date. The Contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. Also, if devices are used during the course of the construction, the Contractor shall extend the warranty so that the warranty period begins at the date of substantial completion. The Owner has the right to order repairs to any equipment or work provided under these

drawings and specifications and to charge the Contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

END OF SECTION 26 01 00

SECTION 26 05 00 - BASIC ELECTRICAL MATERIALS AND METHODS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following electrical materials and methods:
 - 1. Supporting devices for electrical components
 - 2. Sleeves for electrical raceways/cables
 - 3. Firestopping
 - 4. Touchup painting
 - 5. Cutting and patching
 - 6. Electrical demolition

1.3 SUBMITTALS

- A. General: No submittals required this section.

1.4 QUALITY ASSURANCE

- A. Comply with the 2017 National Electrical Code for components and installation.
- B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate electrical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.
- C. Coordinate installation of required supporting devices and setting of sleeves in poured-in-place concrete and other structural components as they are constructed.
- D. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning prior to closing in the building.
- E. Coordinate connecting electrical service to components furnished under other Sections.

- F. Coordinate connecting electrical systems with exterior underground and/or overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

PART 2 - PRODUCTS AND INSTALLATION

2.1 SUPPORTING DEVICES

- A. Channel and angle support systems, hangers, anchors, sleeves, brackets, fabricated items, and fasteners are designed to provide secure support from the building structure for electrical components.
 - 1. Material: Steel, except as otherwise indicated, protected from corrosion with zinc coating or with treatment of equivalent corrosion resistance using an alternative finish.
 - 2. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel, except as otherwise indicated.
- B. Steel channel supports have 9/16-inch diameter holes at a maximum of 8" o.c., in at least 1 surface.
 - 1. Fittings and accessories mate and match with channels and are from the same manufacturer.
 - 2. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel, except as otherwise indicated.
- C. Raceway and Cable Supports: Riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps or "click"- type hangers.
- D. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable iron casting with hot-dip galvanized finish.
- E. Expansion Anchors: Carbon-steel wedge or sleeve type.
- F. Toggle Bolts: All-steel springhead type.
- G. Powder-Driven Threaded Studs: Heat-treated steel.
- H. Damp Locations and Outdoors: Hot-dip galvanized materials.
- I. Dry Locations: Steel materials with corrosion protection as appropriate for the installation.
- J. Support Clamps for PVC Raceways: Click-type clamp system. Two hole straps may also be used. All straps/clamps used to support PVC raceways shall be non-metallic.
- K. Conform to manufacturer's recommendations for selecting supports.
- L. Strength of Supports: Adequate to carry all present and future loads, times a safety factor of at least 4; 200-lb- minimum design load.

- M. Install devices to securely and permanently fasten and support electrical components.
- N. Raceway Supports: Comply with National Electrical Code and the following requirements:
1. Conform to manufacturer's recommendations for selecting and installing supports.
 2. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
 3. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
 4. Spare Capacity: Size supports for multiple conduits so capacity can be increased by a 25 percent minimum in the future.
 5. Support individual horizontal raceways with separate steel clamps or straps.
 6. Hanger Rods: 1/4-inch diameter or larger threaded steel, except as otherwise indicated.
 7. Spring Steel Fasteners: Specifically designed for supporting single conduits or tubing. May be used for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to channel and slotted angle supports.
 8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports, with no weight load on raceway terminals.
 9. Steel straps used to support raceways larger than 1" trade size, shall be of the two-hole variety. Single hole straps/clamps may be used for raceways not exceeding 1" trade size.
- O. Miscellaneous Supports: Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices except where components are mounted directly to structural features of adequate strength.
- P. In open overhead spaces, support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24" from the box.
- Q. Fastening: Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure. Perform fastening according to the following:
1. Fasten by means of wood screws or screw-type nails on wood; toggle bolts on hollow masonry units; concrete inserts or expansion bolts on concrete or solid masonry; and by machine screws, welded threaded studs, or spring-tension clamps on steel.
 2. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts, machine screws, or wood screws.
 3. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or any other items.
 4. In partitions of light steel construction use sheet-metal screws.
 5. Fill and seal holes drilled in concrete and not used.

6. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof-test load.
- R. When fastening to metal decking, all fasteners shall be installed in the “hollow” lower decking channel. Fastening through the upper flat portion of the decking rather than the “hollow” lower channel is not allowed. Fasteners shall not be longer than the depth of this “hollow” lower channel in order to ensure that the fastener does not puncture the roof membrane or extend into the roof tapering material.
- S. Electrical devices located within suspended ceiling tiles (motion detectors, smoke detectors, intercom speakers, exit lights, etc.) shall not be supported by the suspended ceiling tile. Rated bar hangers connected to the suspended ceiling grid shall be used to support these devices.

2.2 SLEEVES FOR ELECTRICAL RACEWAYS/CABLES

- A. General: The Electrical Contractor shall provide all sleeves for electrical items as described below.
- B. Install for all cable and raceway penetrations of poured in place concrete walls and floors other than slab on grade. Install for all cable penetrations of masonry and fire rated or non-fire rated gypsum walls.
- C. Sleeves shall be installed during the erection of applicable walls. If any gap remains between the sleeve and the surrounding surface, this gap shall be patched with the appropriate material. Provide weatherproofing as appropriate.
- D. Sheet-Metal Sleeves: 0.0276-inch or heavier galvanized sheet steel, round tube, closed with welded longitudinal joint.
- E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- F. Appropriately sized EMT conduit may be used in lieu of sheet metal sleeves for all interior penetrations.
- G. All sleeves serving electrical cables shall be equipped with screw-on or nonmetallic bushings on both ends.

2.3 FIRESTOPPING

- A. General: The Electrical Contractor shall provide all firestopping as described below.
- B. Apply to cable and raceway penetrations of fire-rated floor and wall assemblies. Perform firestopping as specified in Division 26 Section “Electrical Firestopping” to reestablish the original fire-resistance rating of the assembly at the penetration.

2.4 TOUCHUP PAINTING

- A. General: The Electrical Contractor shall provide all touchup painting for electrical related items as described below.

- B. For Equipment: Provided by equipment manufacturer and selected to match equipment finish.
- C. For Non-equipment Surfaces: Matching type and color of undamaged, existing adjacent finish.
- D. For Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.
- E. Thoroughly clean damaged areas and provide primer, intermediate, and finish coats to suit the degree of damage at each location.
- F. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

2.5 CUTTING AND PATCHING

- A. General: The Electrical Contractor shall provide all cutting and patching for electrical related items as described below.
- B. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for electrical installations. Perform cutting by skilled mechanics of the trades involved. If agreement is made for others to perform the necessary cutting and patching, the Electrical Contractor is responsible for final quality control.
- C. Repair disturbed surfaces to match adjacent undisturbed surfaces. Patch and finish back to original condition.

2.6 DEMOLITION

- A. General: The Electrical Contractor shall provide all electrical demolition as described below.
- B. Where electrical work to remain is damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- C. Accessible Work Indicated to Be Demolished: Remove exposed electrical installation in its entirety.
- D. Abandoned Work: Cut and remove buried raceway and wiring indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap and patch surface to match existing finish.
- E. Removal: Remove demolished material from the project site. All material shall be disposed of in accordance with EPA guidelines.
- F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.
- G. Reconnect all circuits interrupted by demolition that are to remain in service. Extend existing raceway and conductors as required.

- H. Coordinate and schedule all necessary power outages with the Owner prior to proceeding with such work. This shall be done to insure that normal operations of the building are not interrupted without prior approval.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION REQUIREMENTS

- A. Install components and equipment to provide the maximum possible headroom where mounting heights or other location criteria are not indicated.
- B. Install items level, plumb, parallel and perpendicular to other building systems and components, except where otherwise indicated.
- C. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Give right of way to raceways and piping systems installed at a required slope.
- E. Coordinate all device heights prior to rough in with architectural cabinetry, counter tops, mirror locations, and backsplashes. Coordinate with architectural plans and elevations.
- F. All conduit roof penetrations to mechanical units shall be inside of mechanical mounting curbs for unit being powered. No separate penetrations allowed.
- G. Electrical equipment shall be installed in a neat and workmanlike manner.
- H. The height of electrical device boxes shall not exceed 48" to the top of the box unless noted otherwise. Electrical boxes located within a wall built of concrete masonry units (CMU) shall align the CMU joint with the top or bottom of the box and shall be consistent throughout the project. Cutting the device box into the center of a CMU in order to achieve the general specified height is not necessary unless specifically noted otherwise.
- I. Associated electrical devices (power and data receptacles, data and telephone receptacles, etc.) shall be installed within 13" of each other measured center to center. In stud construction, the Electrical Contractor shall provide framing as necessary to install these devices within the given dimensions.
- J. Provide separate feed for each lighting fixture. Fixtures shall not be connected in a "daisy-chain" arrangement. Flexible metal conduit (FMC) -3/8" minimum size or #12 AWG type AC cable containing 3 conductors and a bonding tape may be used for fixture connections. Regardless of connection method, fixture whips shall not exceed 6'-0" in length.
- K. Provide manufacturers approved bushings at all AC cable termination points.

END OF SECTION 26 05 00

SECTION 26 05 19 - CONDUCTORS AND CABLES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes building conductors and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for branch circuit connectors and splices.
- C. Product data for MC Cable and connectors.

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide conductors and cables specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- B. Comply with the 2017 National Electrical Code.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver conductors and cables according to NEMA WC 26.

1.6 COORDINATION

- A. Coordinate layout and installation of cables with other installations.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Conductors and Cables:
 - a. United Wire and Cable

- b. General Cable
- c. Southwire Company
- d. CME Wire and Cable
- e. Encore Wire Corp.

2. Connectors for Conductors and Cables:

- a. AMP Incorporated
- b. General Signal; O-Z/Gedney Unit
- c. Square D Co.; Anderson
- d. 3M Company; Electrical Products Division
- e. WAGO COMPACT lever style terminal block splicing connectors

2.2 BUILDING CONDUCTORS AND CABLES

- A. UL-listed building conductors and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Conductors and Insulation Applications" Article.
- B. Rubber Insulation Material: Comply with NEMA WC 3.
- C. Thermoplastic Insulation Material: Comply with NEMA WC 5.
- D. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC 7.
- E. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC 8.
- F. Conductor Material: Copper
- G. Stranding: Solid conductor for No. 12 AWG and smaller; stranded conductor for No. 8 AWG and larger, No. 10 AWG to be either solid or stranded (contractor's preference).

2.3 CONNECTORS AND SPLICES

- A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated.
- B. For 10 AWG and smaller, twist style pressure connectors (i.e. wire nuts or twist lock connectors) shall be used to ensure an adequate mechanical and electrical connection.
- C. For 20 amp circuits utilizing 10 AWG and smaller cable, twist style pressure connectors (i.e. wire nuts/twist lock connectors) or lever style splicing terminal block connectors (WAGOs) may be used.
- D. Comply with project's installation requirements and as specified in Part 3 "Conductor and Insulation Applications".

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine raceways and building finishes to receive conductors and cables for compliance with requirements for installation tolerances and other conditions affecting performance of conductors and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 CONDUCTOR AND INSULATION APPLICATIONS

- A. Feeders: Type THHN/THWN copper, in raceway.
- B. Branch Circuits: Type THHN/THWN copper, in raceway.
- C. Branch Circuits: Type THHN/THWN copper, in raceway. Also, Type MC cable which contains circuit conductors and a grounding conductor in addition to the metal cladding, 90°C insulation
- D. Control Circuits: Type THHN/THWN copper, in raceway

3.3 INSTALLATION

- A. Install conductors and cables as required, according to manufacturer's written instructions and NECA's "Standard of Installation."
- B. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Section "Basic Electrical Materials and Methods."
- F. Seal around cables penetrating fire-rated elements according to Division 26 Section "Electrical Firestopping."
- G. Identify conductors and cables according to Division 26 Section "Electrical Identification."
- H. MC cable which contains circuit conductors and a grounding conductor in addition to the metal cladding can be used for light fixture whips and branch circuits, as long as the local jurisdiction allows the use of MC cable.
- I. AC cable containing 3 conductors (hot, neutral, equipment ground) and a bonding tape is allowed for light fixture whips only. All AC cables shall be terminated with proper bushings. Wire gauge shall be #12 AWG min. reduced size conductors are not allowed.

3.4 CONNECTIONS

- A. Conductor Splices: Keep to minimum. No splices or wire nuts allowed in panelboards. Pull adequate conductor lengths to eliminate splices and wire nuts in panels.
- B. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
- C. Use splice and tap connectors compatible with conductor material.
- D. Wiring at Outlets: Install conductor at each outlet, with at least 7 inches of slack. Where multiple sets of conductors enter a box, provide 7 inch pigtails to devices and make connections such that the continuity of the branch circuit conductors is not dependent upon device connections and the continuing load is not routed through the device. All unused device terminal screws shall be turned completely in. Provide two full wraps of electrical tape around all device terminals. On 20 amp circuits where #10 AWG conductors are required for home run per drawings, provide #12 AWG solid pigtails for connection to device. Do not use crimp connections/stranded wire on devices. Exception: Stranded pigtails with factory crimped connectors.
- E. Connect outlets and components to wiring and to ground as required.
- F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

- A. Testing: On installation of conductors and cables and before electrical circuitry has been energized, verify product capability and compliance with industry standard requirements.
- B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to verify compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 26 05 19

SECTION 26 05 33 - RACEWAYS AND BOXES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes raceways, fittings and boxes for electrical wiring.
 - 1. Raceways include the following:
 - a. RMC: Rigid metal conduit
 - b. IMC: Intermediate metal conduit
 - c. EMT: Electrical metallic tubing
 - d. FMC: Flexible metal conduit
 - e. LFMC: Liquid tight flexible metal conduit
 - f. RNC: Rigid nonmetallic conduit (PVC)
 - g. Surface raceways
 - 2. Boxes include the following:
 - a. Outlet and Device boxes
 - b. Pull and junction boxes
- B. Related Sections include the following:
 - 1. Division 26 Section "Electrical Firestopping" for firestopping requirements.
 - 2. Division 26 Section "Basic Electrical Materials and Methods" for raceways and box supports.
 - 3. Division 26 Section "Wiring Devices" for devices installed in boxes.

1.3 SUBMITTALS

- A. Shop Drawings: Include product data and drawings showing the following components:
 - 1. Conduit fittings to be utilized
 - 2. Surface Metal Raceway
 - 3. Insulated Throat Connectors

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

- B. Comply with NECA's "Standard of Installation."
- C. Comply with the 2017 National Electrical Code.

1.5 COORDINATION

- A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Metal Conduit and Tubing:
 - a. Allied Tube and Conduit
 - b. Western Tube and Conduit
 - c. Republic Conduit
 - d. Wheatland Conduit
 - 2. Nonmetallic Conduit:
 - a. Cantex
 - b. Heritage Plastics
 - c. Ipex
 - d. JM Eagle
 - e. Kraloy
 - f. Prime
 - g. PW Pipe
 - h. Ridgeline
 - i. Southern Pipe
 - 3. Conduit Bodies and Fittings:
 - a. Carlon Electrical Products/Thomas & Betts
 - b. Crouse-Hinds; Div. of Cooper Industries
 - c. Hubbell, Inc.; Killark Electric Manufacturing Co.
 - d. O-Z/Gedney/Emerson Industrial/Appleton
 - e. Bridgeport Fittings
 - 4. Metal Wireways:
 - a. B-Line
 - b. Hoffman Engineering Co.
 - c. Milbank Manufacturing
 - d. Square D Co.

5. Surface Metal Raceways:
 - a. Wiremold Co. (The); Electrical Sales Division
 - b. Panduit Corp.
 - c. Monosystems

6. Boxes:
 - a. American Electric; FL Industries
 - b. Arlington Industries
 - c. Butler Manufacturing Co.; Walker Division
 - d. Cooper Wiring Devices
 - e. Crouse-Hinds; Div. of Cooper Industries
 - f. Hoffman Engineering Co.; Federal-Hoffman, Inc.
 - g. Hubbell Inc.; Killark Electric Manufacturing Co.
 - h. Hubbell Inc.; Raco, Inc.
 - i. Intermatic
 - j. Lamson & Sessions; Carlon Electrical Products
 - k. O-Z/Gedney; Unit of General Signal
 - l. Robroy Industries, Inc.; Electrical Division
 - m. Thomas & Betts Corp.
 - n. Woodhead Industries, Inc.; Daniel Woodhead Co.

2.2 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.3
- B. Intermediate Metal Conduit: ANSI C80.6
- C. Electrical Metallic Tubing and Fittings: ANSI C80.3 and UL 514B-2012
 1. Fittings: Set-screw or compression type, die cast zinc, zinc-coated steel. Malleable fittings are not acceptable. Provide insulated throat connectors for circuits over 150 volts to ground, motor circuits, and for conduit size 1 inch and larger.
 2. Conduit Colors: Provide conduit in the required color. Conduit color must be continuous and pre-manufactured from conduit supplier. Allied "True Color" EMT or similar. See specifications section 26 05 53 – Electrical Identification
- D. Flexible Metal Conduit: Zinc-coated steel
- E. Liquid Tight Flexible Metal Conduit: Flexible steel conduit with PVC jacket
- F. Fittings: All fittings shall be listed UL 514B-2012 and NEMA FB-1, die cast zinc fittings must be manufactured with ASTM B86 certified materials.
- G. Rigid Steel and IMC Bushings: Provide insulated bushings or insulated throat hubs on the ends of Rigid Steel Conduit and IMC where the conduit enters a box. Install bushings before wire is pulled in conduit, do not slit or cut bushing to install after wire has been pulled in conduit.

- H. EMT Stub Bushings: Provide for systems and lighting control conduit stubs and all open start and end points – “Arlington Industries” insulated nylon push-on bushings.
 - 1. Listed for environmental air handling spaces.
 - 2. Provide trade size as needed, EMT75, EMT100, etc.
 - 3. Install bushings before wire is pulled in conduit, do not slit or cut bushing to install after wire has been pulled in conduit.

2.3 NONMETALLIC CONDUIT

- A. Rigid Nonmetallic Conduit: NEMA TC 2, Schedule 40 and/or 80 PVC, per wiring methods.
- B. Rigid Nonmetallic Conduit Fittings: NEMA TC 3; match to conduit type and material.
- C. Bushings: Provide insulated bushings on the ends of conduit where the conduit enters a box for circuits over 150 volts to ground, motor circuits, and for conduit size 1 inch and larger. Install bushings before wire is pulled in conduit, do not slit or cut bushing to install after wire has been pulled in conduit.

2.4 SURFACE RACEWAYS

- A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer’s standard prime coating.
- B. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways. See drawings for specifications.

2.5 OUTLET AND DEVICE BOXES

- A. Sheet Metal Boxes: NEMA OS 1
- B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover for outside applications, unless noted otherwise.
- C. Size as required by NEC article 314.

2.6 PULL AND JUNCTION BOXES

- A. Small Sheet Metal Boxes: NEMA OS 1
- B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover for outside applications.
- C. Size as required by NEC article 314.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive raceways and boxes for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRING METHODS - (ENT - Electrical Non-metallic Tubing is not acceptable anywhere on this project.)

- A. Indoors: Use the following wiring methods:
 - 1. Exposed: EMT
 - 2. Concealed: EMT
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.
 - 4. Damp or Wet Locations: Rigid steel or IMC
 - 5. Under concrete slab floor: RNC, Rigid steel, or IMC
 - 6. Boxes: NEMA 250, Type 1, except in damp or wet locations use NEMA Type 3R or Type 4.

3.3 INSTALLATION

- A. Install raceways and boxes as required, according to manufacturer's written instructions.
- B. Minimum Raceway Size: 1/2-inch trade size. Light fixture whips may be 3/8".
- C. Conceal all conduit, unless otherwise indicated, within finished walls, ceilings, and below floors.
- D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- E. Install raceways level and square and at proper elevations. Provide adequate headroom.
- F. Support raceways as specified in Division 26 Section "Basic Electrical Materials and Methods." Use raceway straps and supports compatible with raceways and suitable for use and location. Do not use tie-wire or any other method not specifically designed for use with electrical raceways.
- G. Use temporary closures to prevent foreign matter from entering raceways.
- H. Make bends and offsets so inside diameter is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
- I. Where a conduit enters a box make offset such that the conduit is perpendicular to the box, conduit fitting fits squarely into the knock-out and the box is level when conduit

termination is complete. Provide a offset regardless of whether the conduit is exposed or concealed within a wall or ceiling.

- J. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.
- K. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.
- L. No Raceways Embedded in Slabs: Install conduit a minimum of 4 inches below bottom of concrete slab where routing raceway underfloor.
 - 1. Transition nonmetallic conduit to rigid steel conduit or IMC before rising above floor slabs, where above floor conduit is to be exposed.
 - 2. Transition nonmetallic conduit to EMT immediately after rising above floor slabs, where above floor conduit is to be concealed in a wall. Transition to EMT is not required when conduit is terminating in recessed box not more than 18 inches above the floor.
 - 3. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- M. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.
 - 1. Run parallel or banked raceways together, on common supports where practical.
 - 2. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- N. Join raceways with fittings designed and approved for the purpose and make joints tight.
 - 1. Make raceway terminations tight. Use bonding bushings at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
 - 2. Use insulated throat fittings or insulating bushings to protect conductors as required in this section.
- O. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.
- P. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.
- Q. Flexible Connections: Use maximum of 6 feet of flexible conduit for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use Liquid tight flexible conduit in wet or damp locations.

- R. Do not install aluminum conduit.
- S. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying the raceways to receptacle or fixture ground terminals.
- T. Install structurally mounted pull and junction boxes with at least two screws/bolts, more as required for larger sized boxes.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.

3.5 CLEANING

- A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 26 05 33

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes identification of electrical materials, equipment, and installations.

1.3 SUBMITTALS

- A. General: No submittals required this section.

1.4 QUALITY ASSURANCE

- A. Comply with the 2017 National Electrical Code.
- B. Comply with ANSI C2.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate installing electrical identification after completion of finishing where identification is applied to field-finished surfaces.
- B. Coordinate installing electrical identifying devices and markings prior to installing acoustical ceilings and similar finishes that conceal such items.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. American Labelmark Co.; Labelmaster Subsidiary
 2. Brady USA, Inc.; Industrial Products Div.
 3. Carlton Industries, Inc.
 4. Ideal Industries, Inc.
 5. National Band & Tag Co.
 6. Panduit Corp.

2.2 RACEWAY AND CABLE LABELS

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, National Electrical Code, and these Specifications.

- B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl. Legend is over laminated with a clear, weather- and chemical-resistant coating.
- C. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

2.3 ENGRAVED NAMEPLATES AND SIGNS

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, National Electrical Code, and these Specifications.
- B. Engraving stock, melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 sq. in., 1/8 inch thick for larger sizes.
 - 1. Engraved Legend: White letters on black face
 - 2. Self-adhesive products

2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties with the following features:
 - 1. Minimum Width: 3/16 inch
 - 2. Tensile Strength: 50 lb. minimum
 - 3. Temperature Range: Minus 40 to 185 deg F (Minus 4 to 85 deg C)
 - 4. Color: As indicated where used for color coding.
- B. Paint: Alkyd-urethane enamel over primer as recommended by enamel manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install identification devices according to manufacturer's written instructions.
- B. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
- C. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations used in the Contract Documents or required by codes and standards. Use consistent designations throughout the Project.
- D. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- E. Self-Adhesive Identification Products: Clean surfaces of dust, loose material, and oily films before applying. Be sure to remove any protective surface tape from labels exposed to the sun as soon as installed.

- F. Install painted identification as follows:
1. Clean surfaces of dust, loose material, and oily films before painting.
 2. Prime Surfaces: For galvanized metal, use single-component, acrylic vehicle coating formulated for galvanized surfaces. For concrete masonry units, use heavy-duty, acrylic-resin block filler. For concrete surfaces, use clear, alkali-resistant, alkyd binder-type sealer.
 3. Apply one intermediate and one finish coat of silicone alkyd enamel.
 4. Apply primer and finish materials according to manufacturer's instructions.
- G. Install Circuit Identification on Branch Circuit Boxes as Follows:
1. Exposed and Concealed Boxes: Neatly written, permanent black marker indicating panel and circuit numbers within.
- H. Color-Code Conductors: Secondary service, feeder and branch circuit conductors throughout the secondary electrical system.
1. 208/120-V 3 Phase Wye System: As follows:
 - a. Phase A: Black
 - b. Phase B: Red
 - c. Phase C: Blue
 - d. Neutral: White
 - e. Neutral Emergency Power: White with blue stripe.
 - f. Equipment Ground: Green
 2. 480/277-V 3 Phase Wye System: As follows:
 - a. Phase A: Brown
 - b. Phase B: Orange
 - c. Phase C: Yellow
 - d. Neutral: Gray
 - e. Neutral Emergency Power: Gray with blue stripe.
 - f. Equipment Ground: Green with Yellow Stripe
 3. Where two different voltage systems of grounded conductors (neutrals) are present in the same enclosure, junction box or gutter, one neutral may be white or gray, but the other neutral shall be white with a stripe that is not green.
 4. Factory-apply color the entire length of the conductors, except the following field-applied, color-coding methods may be used in lieu of factory-coded wire for sizes larger than No. 6 AWG.
 - a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply the last 2 turns of tape with no tension to prevent possible unwinding. Use 1-inch- wide tape in colors as specified. Adjust tape bands to avoid obscuring cable identification markings.
 - b. Colored cable ties applied in groups of 3 ties of specified color to each wire at each terminal or splice point starting 3 inches from the terminal and spaced 3 inches apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

- I. Apply identification to conductors as follows:
 - 1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
- J. Install identification as follows:
 - 1. Apply equipment identification labels of engraved plastic laminate on each major unit of equipment, including central or master unit of each system. This includes communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Except as otherwise indicated, provide a single line of text with 1/2-inch- high lettering on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment.
 - a. Panelboards, electrical cabinets, and enclosures
 - b. Access doors and panels for concealed electrical items
 - c. Push-button stations
 - d. Contactors
 - e. Disconnects
 - 2. For panelboards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker. No self-adhesive panel directories will be accepted.
 - 3. Where different nominal voltages are present in the same building provide an engraved plaque describing voltage, phase, and conductor color code for each different system, on the cover of every new panelboard and switchboard in the building. In public areas, plaque shall be located within the panel door.
 - a. Provide self-adhesive product
 - b. White letters on black face
 - c. Provide sample plaque to Engineer for final review and approval prior to ordering all remaining plaques for panelboards and switchboards.
 - 4. For motor starters, provide engraved labels as previously noted. Label shall list motor designation as shown on motor schedule as well as field verified motor horsepower and full load amps. Example: HWP1, 5 HP, 17.5 FLA.

END OF SECTION 26 05 53

SECTION 26 06 00 - ELECTRICAL FIRESTOPPING**PART 1 - GENERAL****1.1 SUMMARY**

- A. Section Includes:
1. Through-penetration firestopping in fire rated construction.
 2. Through-penetration smoke stopping in smoke partitions.

1.2 REFERENCES

- A. Underwriters Laboratories
1. UL Fire Resistance Directory
 - a. Through-penetration firestop devices (XCHR)
 - b. Fire resistance ratings (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void or cavity material (XHHW)
- B. American Society for Testing and Materials Standards:
1. ASTM E 814-88: Standard Test Method for Fire Tests of Through-Penetration Firestops.

1.3 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire gasses and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.
- F. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.4 SYSTEM DESCRIPTION

A. Design Requirements:

1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound or vibration absorption and at other construction gaps.
2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and type of construction and at all separations required to permit building movement and sound or vibration absorption and at other construction gaps.

1.5 SUBMITTALS

A. Submit in accordance with Section 26 01 00, unless otherwise indicated.

B. Product Data: Manufacturer's specifications and technical data including the following:

1. Detailed specification of construction and fabrication.
2. Manufacturer's installation instructions.

C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware and installation procedures, plus the following specific requirements.

1. Details of each proposed assembly identifying intended products and applicable UL system number or UL classified devices.
2. Manufacturer or manufacturer's representative shall provide qualified engineering judgements and drawings relating to non-standard applications as needed.

1.6 QUALITY ASSURANCE

A. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers or UL classified devices.

B. Materials shall have been tested to provide fire rating at least equal to that of the construction.

1.7 DELIVERY, STORAGE AND HANDLING

A. Packing and Shipping:

1. Deliver products in original unopened packaging with legible manufacturer's identification.
2. Coordinate delivery with scheduled installation date, allow minimum storage at site.

B. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.8 PROJECT CONDITIONS

A. Existing Conditions:

1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.

B. Environmental Requirements:

1. Furnish adequate ventilation if using solvent.
2. Furnish forced air ventilation during installation if required by manufacturer.
3. Keep flammable materials away from sparks or flame.
4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

PART 2 - PRODUCTS

2.1 THROUGH-PENETRATION FIRESTOPPING AND FIRE-RATED CONSTRUCTION

- A. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free.

1. Additional Requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
2. Acceptable Manufacturers and Products:
 - a. Manufacturer shall be 3M or S.T.I.
 - b. Products shall be listed in the UL Fire Resistance Directory for the UL system.
3. All firestopping products must be from a single manufacturer.

2.2 SMOKE STOPPING AT SMOKE PARTITIONS

- A. Through-Penetration Smoke-Stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2.3 ACCESSORIES

- A. Fill, Void or Cavity Materials: As classified under category XHHW in the UL Fire Resistance Directory.
- B. Forming Materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.3 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of openings with firestopping material tested for the application. See UL Fire Resistance Directory.
- F. Where rated walls are constructed with horizontally continuous air space, double width masonry or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.
- G. Install smoke stopping as specified for firestopping.

3.4 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION 26 06 00

SECTION 26 22 00 - DRY-TYPE TRANSFORMERS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes dry-type transformers rated 1000 V and less.
- B. Related Sections include the following:
 - 1. Division 26 Section 26 05 33 "Identification" for identification requirements.
 - 2. Division 26 Section 26 05 00 "Basic Electrical Materials and Methods" for concrete requirements.

1.3 SUBMITTALS

- A. Product Data: Include data on features, components, ratings, and performance for each type of transformer specified. Include dimensioned plans, sections, and elevation views. Show minimum clearances and installed devices and features.
- B. Wiring Diagrams: Detail wiring and identify terminals for tap changing and connecting field-installed wiring.
- C. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment.
- D. Operation and Maintenance Data: For transformers to include in the "Operation and Maintenance Manuals" specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Comply with IEEE C2 "National Electrical Safety Code".
- B. Comply with the 2017 National Electrical Code.
- C. Listing and Labeling: Provide transformers specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit throughout periods during

which equipment is not energized and is not in a space that is continuously under normal control of temperature and humidity.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide transformers by one the following:
1. Eaton Power
 2. General Electric Co.; Electrical Distribution & Control Div.
 3. Hammond Power Solutions
 4. Siemens Energy & Automation, Inc.
 5. Square D; Groupe Schneider.

2.2 TRANSFORMERS, GENERAL

- A. Description: Factory-assembled and -tested, convection air-cooled units of types specified, designed for 60-Hz service.
- B. Cores: Grain-oriented, nonaging silicon steel.
- C. Coils: Continuous windings without splices, except for taps.
- D. Internal Coil Connections: Brazed.
- E. Enclosure: NEMA 250, Type 1, ventilated, unless noted otherwise.
- F. KVA Ratings: Based on convection cooling only and not relying on auxiliary fans.

2.3 DRY-TYPE TRANSFORMERS (Unless otherwise noted all transformers shall comply with the following):

- A. Comply with NEMA Standard ST 20 "Dry-Type Transformers for General Applications."
- B. Comply with U.S. DOE 2016 Standards on single and three-phase low-voltage distribution transformers 15kVA and larger. Units shall be marked as compliant with DOE 2016.
- C. 3-Phase Transformers: Two-winding type, 3-phase units using 1 coil per phase in primary and secondary.
- D. Windings: All copper.
- E. Low Sound Level Units: Minimum of 3 dBA less than NEMA ST 20 standard sound levels when factory tested according to IEEE Standard C57.12.91, "Test Code for Dry-Type Distribution and Power Transformers."
- F. UL K-4 rated for typical non-linear load service.

- G. Enclosure: NEMA 250, Type 1, ventilated, for interior transformers. Enclosure/core shall be pre-bonded without blocking vents.
- H. Vibration Isolators: Provide vibration isolation for all transformers. Indicate feature in shop drawings.
- I. Insulation Class: 220 deg C class for transformers larger than 15 kVA.
 - 1. Insulation Temperature Rise: 115 deg C maximum rise above 40 deg C at full load.
- J. Taps: For transformers 3 kVA and larger, full capacity taps in high-voltage winding are as follows:
 - 1. 15 kVA through 500 kVA: Six 2.5-percent taps, 2 above and 4 below rated high voltage.
- K. Grounding: Provide ground bus kit or a ground bar installed on the inside of the transformer enclosure.

2.4 IDENTIFICATION

- A. Nameplates: Provide self-adhesive label for each distribution transformer. Self-adhesive labels are specified in Section 26 05 33 "Electrical Identification".

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Arrange equipment to provide adequate spacing for access and for circulation of cooling air.
- B. Identify transformers and install warning signs according to Division 26 Section 26 05 33 "Electrical Identification."
- C. No reverse 'backfeeding' of transformers allowed.
- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.2 GROUNDING

- A. Separately Derived Systems: Comply with the National Electrical Code requirements and Division 26 Section "Grounding" for connecting to grounding electrodes and for bonding to metallic piping near the transformer.

3.3 FIELD QUALITY CONTROL

- A. Test Objectives: To ensure transformer is operational within industry and manufacturer's tolerances, is installed according to the Contract Documents, and is suitable for energizing.
- B. Tests: Include the following minimum inspections and tests according to manufacturer's written instructions. Comply with IEEE C57.12.91 for test methods and data correction factors.
 - 1. Inspect accessible components for cleanliness, mechanical and electrical integrity, and damage or deterioration. Verify that temporary shipping bracing has been removed. Include internal inspection through access panels and covers.
 - 2. Inspect bolted electrical connections for tightness according to manufacturer's published torque values or, if not available, those specified in UL 486A and UL 486B.
 - 3. Insulation Resistance: Perform megohmmeter tests of primary and secondary winding to winding and winding to ground.
 - a. Minimum Test Voltage: 1000 V, dc.
 - b. Minimum Insulation Resistance: 500 megohms.
 - c. Duration of Each Test: 10 minutes.
 - d. Temperature Correction: Correct results for test temperature deviation from 20 deg C standard.
- C. Test Failures: Compare test results with specified performance or manufacturer's data. Correct deficiencies identified by tests and retest. Verify that transformers meet specified requirements.

3.4 ADJUSTING

- A. After installing and cleaning, touch-up scratches and mars on finish to match original finish.
- B. Adjust transformer taps to provide optimum voltage conditions at utilization equipment throughout normal operating cycle of facility. Record primary and secondary voltages and tap settings and submit with test results.

END OF SECTION 26 22 00

SECTION 26 24 16 - PANELBOARDS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V and less.
- B. Related Sections include the following:
 - 1. Division 26 Section "Basic Electrical Materials and Methods" for general materials and installation methods.
 - 2. Division 26 Section "Electrical Identification" for labeling materials.

1.3 SUBMITTALS

- A. Product Data: For each type of panelboard, accessory item, and component specified.
- B. Shop Drawings: For panelboards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:
 - 1. Enclosure type with details for types other than NEMA 250, Type 1.
 - 2. Bus configuration and current ratings.
 - 3. Short-circuit current rating of panelboard.
 - 4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
 - 5. Wiring Diagrams: Details of schematic diagram including control wiring and differentiating between manufacturer-installed and field-installed wiring.
 - 6. Provide cut sheets and time-current curves for all circuit breakers.
- C. Maintenance Data: For panelboard components to include in the maintenance manuals specified in Division 1. Include manufacturer's written instructions for testing circuit breakers.

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- B. Comply with the 2017 National Electrical Code.

- C. Comply with NEMA PB 1.

1.5 EXTRA MATERIALS

- A. Keys: 6 spares of each type for panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Eaton Corp.; Cutler-Hammer Products.
 2. General Electric Co.; Electrical Distribution & Control Div.
 3. Siemens Energy & Automation, Inc.
 4. Square D Co.

2.2 PANELBOARD FABRICATION

- A. Enclosures: Surface-mounted cabinets as indicated. NEMA PB 1, Type 1, unless otherwise indicated to meet environmental conditions at installed location.
- B. Front: Secured to box with concealed trim clamps, unless otherwise indicated. Front for surface-mounted panelboards shall be same dimensions as box. No exposed screws allowed for fastening front cover to panelboard.
- C. Directory Frame: Metal, mounted inside each panelboard door. No self-adhesive circuit directories allowed. Provide typed circuit directory in metal frame.
- D. Bus: Hard drawn copper of 98 percent conductivity.
- E. Main, Neutral, and Equipment Ground Lugs: Mechanical type. Alternate connection methods by prior approval only.
- F. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.
- G. Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the overcurrent protective device ampere ratings indicated for future installation of devices.
- H. Special Features: Include the following features for panelboards:
 1. Hinged Front Cover: Entire front trim hinged to box with standard door within hinged trim cover. Hinge to be concealed.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

- B. Doors: In panelboard front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.
- C. No exposed screws allowed for fastening front cover to panelboard.

2.4 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.
 - 1. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting capacity rating as scheduled on drawings.
 - a. Series rating not allowed.
 - 2. Application Listing: Appropriate for application, including Type SWD for switching fluorescent lighting loads and Type HACR for heating, air-conditioning, and refrigerating equipment.
 - 3. Circuit Breakers, 200 A and Larger: Rating plug interchangeable within frame size.
 - 4. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards and accessory items according to NEMA PB 1.1. Install panelboards in locations as indicated, according to manufacturer's written instructions. **Verify that the installation location will be readily accessible and will provide the clearances as required by NEC article 110-26(a).**
- B. Mounting Heights: Top of trim 74 inches above finished floor, unless otherwise indicated.
- C. Mounting: Plumb and rigid without distortion of box. For surface mounted panelboards on all wall types; provide 3/4" plywood backboard with two coats of light gray fire resistant paint. For mounting panelboard where multiple panelboards are installed in one location, plywood sheeting shall be continuous.
- D. Circuit Directory: Type directory to indicate installed circuit loads. Install directory in metal frame. No self-adhesive directories accepted.
- E. Install filler plates in unused spaces.
- F. Wiring in Panelboard Gutters: Arrange conductors into groups, and bundle and wrap with wire ties.

3.2 IDENTIFICATION

- A. Identification Plaque: Label each panelboard with self-adhesive, engraved plaque with panelboard name. See Section 26 05 53 "Electrical Identification".

- B. Voltage System Color Code Plaque: Label each panelboard with self-adhesive, engraved plaque describing voltage, phase and conductor color code for each different system. See Section 26 05 53 "Electrical Identification". Mount inside panelboard door in public areas.

3.3 GROUNDING

- A. Make equipment grounding connections for panelboards as required.
- B. Provide ground continuity to main electrical ground bus as required.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

- A. Test as follows:
 - 1. Make insulation-resistance tests of each panelboard bus, component, and connecting supply, feeder, and control circuits.
 - 2. Make continuity tests of each circuit.

3.6 ADJUSTING

- A. Set field-adjustable switches and circuit-breaker trip ranges as required.

3.7 CLEANING

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION 26 24 16

SECTION 26 27 26 - WIRING DEVICES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes receptacles, connectors, switches, and finish plates.
- B. Related sections include the following:
 - 1. Division 26 Section 26 05 33 "Raceways and Boxes".

1.3 SUBMITTALS

- A. Shop Drawings: Include product data and drawings showing components for receptacles, connectors, switches, and finish plates.
- B. Maintenance Data: For materials and products to include in maintenance manuals specified in Specification Section 26 01 00 "General Electrical Requirements".

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products that are listed and labeled for their applications and installation conditions for the environments in which installed.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- B. Comply with NEMA WD 1.
- C. Comply with the 2017 National Electrical Code.

1.5 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

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

1. Wiring Devices:
 - a. Bryant Electric, Inc.
 - b. Eagle Electric Manufacturing Co., Inc.
 - c. GE Company; GE Wiring Devices
 - d. Hubbell, Inc.; Wiring Devices Div.
 - e. Killark Electric Manufacturing Co.
 - f. Leviton Manufacturing Co., Inc.
 - g. Pass & Seymour/Legrand; Wiring Devices Div.

2.2 RECEPTACLES

- A. Straight-Blade and Locking Receptacles: Heavy-Duty, specification grade, NEMA 5-20R.
- B. GFCI Receptacles: NEMA 5-20R duplex receptacle. Feed through feature shall not be used. Provide GFCI receptacle device for each item labeled, noted, or called out in schedules as GFI on drawings. GFI receptacles used in damp or wet locations (such as exterior applications), shall be weather resistant type. See specification section 26 05 33 for recessed box requirements.

2.3 CORD AND PLUG SETS

- A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 1. Cord: Rubber-insulated, stranded-copper conductors, with type SOW-A jacket. Green-insulated grounding conductor, and equipment-rating ampacity plus a minimum of 30 percent.
 2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.4 SWITCHES

- A. Snap Switches: Heavy-duty, quiet type, 20 A, 120/277-V ac

2.5 WALL PLATES

- A. Single and combination types match corresponding wiring devices.
 1. Plate-Securing Screws: Metal with head color to match plate finish
 2. Material for Finished Spaces: 0.04-inch- thick, Type 302, satin-finished stainless steel
 3. Material for Unfinished Spaces: Galvanized steel

2.6 DEVICE FINISHES

- A. Color: Gray, unless otherwise indicated or required by Code.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install devices and assemblies plumb and secure.
- B. Install wall plates when painting is complete.
- C. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on bottom. Group adjacent switches under single, multi-gang wall plates.
- D. Protect devices and assemblies during painting.
- E. Verify device heights above countertops with architectural elevations and casework details.
- F. Install devices at heights specified in Electrical Symbol Legend or as shown on the drawings. All measurements are to center unless noted otherwise. Device heights indicated in the architectural elevations take precedence over symbol legend.

3.2 CONNECTIONS

- A. Connect branch-circuit equipment grounding conductor to wiring device grounding terminal and device box bonding jumper.
- B. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.
- C. Receptacles and Switches:
 - 1. Where multiple sets of conductors terminate at a box, provide pigtails to devices such that the continuity of the branch circuit conductors is not dependent upon device connections and the continuing load is not routed through the device. See Section 26 05 19 "Conductors and Cables".
 - 2. All unused device terminal screws shall be turned completely in. Provide two full wraps of electrical tape around all device terminals. See Section 26 05 19 "Conductors and Cables".

3.3 FIELD QUALITY CONTROL

- A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
- B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- C. Replace damaged or defective components.

3.4 CLEANING

- A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 26 27 26

SECTION 26 28 16 - DISCONNECT SWITCHES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes individually mounted switches used for the following:
 - 1. Equipment disconnect switches
 - 2. Motor disconnect switches

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: For products specified in this section include dimensioned drawings showing front and side views as well as overall dimensions. Ratings of features and components shall also be included. Indicate on each product data sheet which motor/equipment the designated disconnect will be used for. Use motor/equipment name as indicated on the motor/equipment schedule.
- C. Wiring diagrams differentiating between manufacturer-installed and field-installed wiring.
- D. Maintenance data to be included in the operation and maintenance manual.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain disconnect switches from one source and by a single manufacturer.
- B. Comply with the 2017 National Electrical Code for components and installation.
- C. Listing and Labeling: Provide disconnect switches specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

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

1. Disconnect Switches:
 - a. Eaton Corp.; Cutler-Hammer Products
 - b. General Electric Co.; Electrical Distribution and Control Division
 - c. Siemens Energy & Automation, Inc.
 - d. Square D Co.

2.2 DISCONNECT SWITCHES

- A. Enclosed, Non-fusible Switch: Type HD, handle to be lockable with two padlocks and interlocked with cover in CLOSED position.
- B. Non-fused Rotary Disconnect Switch: Enclosure shall be nonmetallic with gasketed cover. Cover shall be attached to enclosure with hinges. Disconnect switch shall be HP rated with lockable handle capable of accepting two padlocks.
- C. Enclosure: NEMA KS 1, Type 1, unless otherwise specified or required to meet environmental conditions of installed location.
 1. Outdoor Locations: Type 3R
 2. Other Wet or Damp Indoor Locations: Type 4
- D. All disconnect switches serving motors controlled by variable frequency drives shall be equipped with a set of auxiliary contacts for use in signaling to the drive when the disconnect is in the OPEN position.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install disconnect switches in locations as indicated, according to manufacturer's written instructions. **Verify that the installation location will be readily accessible and will provide the clearances as required by NEC article 110-26(a).**
- B. Install disconnect switches level and plumb.
- C. Install wiring between disconnect switches, control, and indication devices.
- D. Connect disconnect switches and components to wiring system and to ground as indicated and instructed by manufacturer.
 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- E. Identify each disconnect switch according to requirements specified in Division 26 Section "Electrical Identification."
- F. Terminate equipment grounding conductors within disconnect switch enclosure with UL approved lugs.

- G. Disconnects serving HVAC equipment shall not be mounted directly to equipment unless specifically noted otherwise. Electrical Contractor shall provide Uni-strut framing as necessary to support disconnect independently from equipment being served. Uni-strut framing shall not be located such that access to equipment is blocked. Coordinate exact location with Mechanical Contractor.

3.2 CLEANING

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

3.3 IDENTIFICATION

- A. Provide identification labels as specified in Section 26 05 53 for all disconnects. Label as indicated on the plans.

END OF SECTION 26 28 16

SECTION 26 51 00 - INTERIOR LED LIGHTING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section includes interior lighting fixtures, LED light sources, drivers, emergency lighting units, and accessories.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 26 Section "Exterior LED Lighting" for exterior security lighting, parking lot lighting, poles and standards.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification sections.
- B. Product data describing fixtures, LED light sources, and emergency lighting units. Arrange product data for fixtures in order of fixture designation. Include data on features and accessories and the following:
 - 1. Outline drawings indicating dimensions and principal features of fixtures.
- C. Shop Drawings detailing fixtures and indicating dimensions, weights, method of field assembly, components, features, and accessories. In addition, provide shop drawings on all drivers.
- D. Wiring diagrams detailing wiring for control system showing both factory-installed and field-installed wiring for specific system of this project, and differentiating between factory-installed and field-installed wiring.
- E. Maintenance data for fixtures to include in the operation and maintenance manual specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Electrical Component Standard: Provide components that comply with the 2017 National Electrical Code and that are listed and labeled by UL where available.
- B. Listing and Labeling: Provide fixtures, emergency lighting units, and accessory components specified in this section that are listed and labeled for their indicated use and installation conditions on project.

1. Special Listing and Labeling: Provide fixtures for use in damp or wet locations, and recessed in combustible construction that are specifically listed and labeled for such use.
 2. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- C. Coordinate fixtures, mounting hardware, and trim with ceiling system and other items, including work of other trades, required to be mounted on ceiling or in ceiling space.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide the products specified in the Light Fixture Schedule shown on the drawings.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

- A. Metal Parts: Free from burrs, sharp corners, and edges.
- B. Sheet Metal Components: Steel, except as indicated. Form and support to prevent warping and sagging. Provide paint after fabrication where specified.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions. Regressed door frames shall be constructed with extruded aluminum.
- D. Reflecting Surfaces: Minimum reflectance as follows, except as otherwise indicated:
1. White Surfaces: 85 percent
 2. Specular Surfaces: 83 percent
 3. Diffusing Specular Surfaces: 75 percent
 4. Laminated Silver Metallized Film: 90 percent
- E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or water white, annealed crystal glass, except as otherwise indicated.
1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 2. Lens Thickness: 0.125 inch minimum; except where greater thickness is indicated.
- F. Fixture Support Components: Comply with Division 26 Section "Basic Electrical Materials and Methods."
- G. LED Lighting:
1. Where indicated on the Light Fixture Schedule, LED fixtures shall utilize a driver capable of being dimmed through industry standard 0-10V signal.
 2. LED lamp life shall be rated at 50,000 hours at a lumen depreciation of 70%. (L70/50,000) minimum.

3. Lumen ratings of the fixture shall be delivered lumens calculated with all lenses and reflectors installed.
- H. Exit Signs: Conform to UL 924 and the following:
1. Sign Colors: Conform to local code
 2. Minimum Height of Letters: Conform to local code
 3. Arrows: Include as indicated
 4. Lamps for AC Operation: Light-emitting diodes (LED), 70,000 hours minimum rated life
- I. U.L. listed as suitable for use in fire rated ceilings: Conform to UL 263. Provide U.L. label on all light fixtures used in fire rated ceilings. See Architectural Drawings for locations of fire rated ceilings.
1. Fire protection box around light fixture provided by others.

2.3 LIGHT SOURCES

- A. LED Color Temperature and Minimum Color-Rending Index (CRI): 4000 K and 82 CRI, except as otherwise indicated.

2.4 FINISHES

- A. Manufacturer's standard, except as otherwise indicated, applied over corrosion-resistant treatment or primer, free of streaks, runs, holidays, stains, blisters, and similar defects.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set units plumb, square, and level with ceiling and walls, and secure according to manufacturer's written instructions and approved Shop Drawings. Support fixtures according to requirements of Division 26 Section "Basic Electrical Materials and Methods."
- B. Support for Recessed and Semi-recessed Grid-Type Fixtures: Units shall be supported from suspended ceiling support system. Ceiling Contractor shall install ceiling support system rods or wires at a minimum of 4 rods or wires for each fixture, located not more than 6 inches from fixture corners. See General Specification sections.
1. Install support clips for recessed fixtures, securely fastened to ceiling grid members, at or near each fixture corner.
 2. Fixtures of Sizes Less than Ceiling Grid: Center in acoustical panel. Support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.
- C. Support light fixture whips off of the ceiling grid with caddy clips or equivalent product.

3.2 CONNECTIONS

- A. Ground Lighting Units: Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replace damaged fixtures and components.
- B. Tests: Verify normal operation of each fixture after fixtures have been installed and circuits have been energized with normal power source. Interrupt electrical energy to verify proper operation of emergency lighting installation.
- C. Replace or repair malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.
- D. Replace fixtures that show evidence of corrosion during project warranty period.

3.4 ADJUSTING AND CLEANING

- A. Clean fixtures after installation. Use methods and materials recommended by manufacturer.
- B. Adjust adjustable fixtures to provide required light intensities.

END OF SECTION 26 51 00

SECTION 28 31 11 - FIRE ALARM SYSTEM**PART 1 - GENERAL****1.1 DESCRIPTION OF WORK**

- A. Extent of fire alarm system work is indicated by the drawings and specifications.
- B. Types of fire alarm system specified in this section include the following:
 - 1. Local Protective Signaling Systems (NFPA 72).
 - 2. Combination, Non-Coded, Zone Style.
 - 3. Digital Alarm 911 Communicator Transmitter (DACT).
- C. Provide system suitable for type occupancy as defined by the local Building Code and as approved by the local Fire Marshal.
- D. Restroom/Locker Room Renovation: Connect to the existing fire alarm system located in the existing building as described below:
 - 1. The existing fire alarm for the building consists of an Notifier 5000 Series zone style control panel. This control panel shall be used for the Renovation work as indicated in this specification and on the drawings. See below for work to be done in the Renovation areas.
 - 2. Scope of work is as follows:
 - a. In the Restroom/Locker Room Renovation areas, new fire alarm wiring will be provided for the new and relocated devices as shown on the drawings.
 - b. At the fire alarm control panel, all existing devices located outside of the Renovation areas shall remain. Make all connections required to connect the new Renovation area devices to the existing control panel.
 - c. The entire fire alarm system shall be UL listed as a system.
 - 3. The final product will result in a single fire alarm system for the School Building. Provide additional equipment at the existing fire alarm control panel as required to operate the additional annunciation devices. Battery calculations shall include new and existing devices.

1.2 CODES AND STANDARDS

- A. NEC Compliance: Comply with applicable requirements of NEC standards pertaining to fire alarm systems.
- B. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to fire alarm systems; and provide products and components which are UL-listed and labeled.

1.3 SUBMITTALS

- A. Product data: Submit manufacturer's technical product data, including specifications and installation instructions, for each type of fire alarm system equipment. Include standard

of typical riser and wiring diagrams, and operation and maintenance instructions for inclusion in maintenance manuals.

- B. Shop Drawings: Provide shop drawings showing equipment/device locations and connecting wiring of entire fire alarm system. Include wiring diagrams, riser diagrams, and NFPA battery calculations. Drawings shall also include descriptive data on system and symbol schedule indicating all devices shown on drawings.
- C. Submission to Authorities Having Jurisdiction: In addition to submission of the above material, make identical submissions to the authorities having jurisdiction (AHJ) (State Fire Marshall's Office, Des Moines, IA). Upon receipt of comments from the authorities having jurisdiction, submit them for review. Resubmit to the AHJ if required to make clarifications or revisions to obtain approval. Provide any payment required to the Fire Marshall's office for plan review.
- D. Refer Part 3 - Execution, requirements for the fire alarm panel programming of room names and room numbers in conjunction with "As-Built" drawings that will be required for project closeout submittals.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide fire alarm systems of one of the following manufacturers:
 - 1. Notifier; Pitway Corp. Div.

2.2 FIRE ALARM AND DETECTION SYSTEMS

- A. General: Provide complete fire alarm system products of types, sizes, and capacities indicated, which comply with manufacturer's standard design, materials, components; construct in accordance with published product information, and as required for complete installation. Provide fire alarm and detection systems for applications indicated.
- B. Zone Style Non-Coded: Either manual activation of fire alarm station or activation of automatic initiating device will energize fire alarm system signaling devices and sound non-coded alarm and provide zone indicator description on the main and annunciator panel.
- C. Design system for alarm sounding continuously throughout facility.
- D. System wiring and supervision:
 - 1. Provide Class B initiating and alarm circuits with electrical supervision for shorts and open conditions. Match existing wiring.
 - 2. Power Supplies: Provide system for operation on 120 VAC power supply. Identify circuit breaker with red engraved self-adhesive label. See Section 26 05 53 "Electrical Identification".
 - 3. Provide 24 hour battery back-up as secondary power supply. Design battery back-up to take over supply to system upon loss of primary system to 85% voltage.

Provide battery system capable of operation of system under alarm conditions.
Battery calculations per the NFPA shall be included in the shop drawing submittals.

- E. Auxiliary Systems, Shunt and Local Energy:
1. Equip and wire system so that when energizing fire alarm audible signaling devices, the panel will also activate the following:
 - a. Interior flashing strobe lights.
 - b. Remote annunciator device indication.
 - c. Fan shut down circuits for duct smoke detectors.
 - d. Smoke door release.
 - e. DACT Device - Calls local 911 communications center or local security company (verify with Owner) to indicate "fire alarm" and account number.
- F. Wiring System Materials: Provide basic wiring materials which comply with Division 26 "Basic Electrical materials and Methods" and "Raceways and Boxes"; types to be selected by Installer. Note this is a conduit wired system.
1. Provide wire and cable in accordance with requirements of manufacturer.
 2. Provide conductors which are listed and approved for fire alarm usage and NEC rated for power limited circuits.
 3. All devices must be supported by appropriate means from t-bar systems of ceilings. Junction boxes tie wired to conduit cross members shall not be allowed. Use products designed for their use.
- G. Restroom/Locker Room Renovation: Utilize the existing Notifier 5000 Series zone style fire alarm panel for all new devices located in the renovated areas. Provide additional equipment as needed at the existing fire alarm panel to accommodate the additional fire alarm equipment shown. The fire alarm system shall operate as a single, integrated UL Listed fire alarm system.
- H. Manual Fire Alarm Stations: Provide manufacturer's ADA compliant and zone style construction, red enclosure, manual fire alarm stations with the following features.
1. ADA compliant.
 2. Semi-flush mounted.
 3. Two step pull function - non breakglass.
 4. General alarm.
- I. Automatic Fire Detectors: Provide manufacturer's zone style construction automatic fire detectors, of the following types and temperature characteristics. Note: Provide removable devices with separate base. All devices shall be interchangeable with bases.
1. Automatic heat detectors:
 - a. Combination rate of rise and fixed temperature spot type, restorable.
 - b. Fixed high temperature detectors in boiler rooms and attic spaces.
 - c. Mount detector on interchangeable type base, capable of operation on either 2-wire or 4-wire loop.

- J. Automatic Smoke (Combustion Products) Detectors: Provide manufacturer's zone style construction automatic smoke detectors of the following types.
1. Photo electric type, restorable, with LED indicator which flashes on normal operation and changes to steady on alarm condition for operation with voltage indicated. Mount detector on interchangeable type base, capable of operation on either 2-wire or 4-wire loop.
- K. Horns: Provide manufacturer's ADA compliant construction fire alarm horn with following features:
1. ADA Compliant - Red Color.
 2. Non-coded.
 3. Flush mounted.
 4. Minimum 87 dB.
 5. Provide weatherproof units where mounted outside.
- L. Alarm Strobe Lights: Provide manufacturer's ADA compliant construction alarm strobe lights with the following features: Provide Candela ratings as required to meet NFPA coverage requirements. Note Candela ratings on shop drawings.
1. ADA Compliant - Red Color.
 2. Clear lens, lettered white "FIRE".
 3. Flush mounted with horn - combination unit.
 4. Ceiling mounted as indicated on plan.
- M. Clear Lexan Covers: Provide clear covers on pull stations with CC designation.
- N. System is zone style. Electrical Contractor shall have the fire alarm equipment supplier program panel with all required changes to the existing zones. See Part 3 under Execution for requirements.
- O. Provide red self-adhesive engraved label for circuit breaker feeding fire alarm system marked "FIRE ALARM CONTROL CIRCUIT". See electrical identification section 26 05 53.
- P. DACT: This device is existing, to remain.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which fire alarm systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION OF BASIC WIRING SYSTEM MATERIALS

- A. Install wiring, raceways, and electrical boxes and fittings in accordance with Division 26 "Basic Electrical Materials and Methods", "Conductors and Cables", and "Raceways and Boxes" for wiring of power limited circuits, per NEC Article 760. Note that this is a conduit wiring system. Refer to this Specification, Section 2.2, Paragraph F. (No exposed fire alarm cabling allowed.)
- B. Install wires and cables without splices. Make connections at terminal strips in cabinets or at equipment terminals. Make soldered splices in electronic circuits in control cabinets.

3.3 FIRE ALARM PANEL PROGRAMMING AND "AS-BUILT" SUBMITTALS

- A. System is zone style. Electrical Contractor shall have the fire alarm equipment supplier program panel with all device room name and number locations.
 - 1. The programming information shall be taken from the Architectural drawings. This programming shall be completed near the building substantial completion in order to enable the entire fire alarm system to be tested and approved by the AHJ to enable building occupancy.
 - 2. The Electrical Contractor shall provide "red-line" as-built drawings of the fire alarm system to reflect any changes to the wiring diagrams and placement of devices made during the course of construction.

3.4 INSTALLATION OF FIRE ALARM SYSTEMS

- A. Install fire alarm system as indicated, in accordance with equipment manufacturer's written instructions and complying with applicable portions of NEC and NECA's "Standard of Installation."
- B. Coordinate exact location of detectors with mechanical equipment. Do not locate detectors in a direct airflow or closer than 3' from an air supply or return diffuser.
- C. Wiring: Wiring of fire alarm system is work of this section, but is not specifically detailed on drawings.
 - 1. Complete wiring in accordance with manufacturer's requirements. Color code wiring and install per manufacturer's point-to-point wiring diagram. Determine exact number of wires for each fire area zone from number and types of devices installed. Connect each device with sufficient wiring to complete its intended operation.
 - 2. Where there are a number of power requiring devices such as smoke detectors, fan relays, door holders and smoke damper operators installed in a circuit, group in numbers so power required does not exceed 80% of manufacturer's power supply rating. Provide extra wiring, or extra power supplies required to fulfill that requirement. In addition, provide extra or larger size wiring to alleviate voltage drops which makes device operate beyond voltage limits for which it was designed. Determine above with manufacturer's representative while equipment is being installed.

D. System Test and Approval:

1. Prior to final acceptance of system, manufacturer of system shall in presence of Contractor, Owner's representative and Engineer's representative, test each sensing or detection and alarm device in accordance with NFPA-72.
2. Submit copy of test results in duplicate after signed by Owner's Representative to Engineer, Owner, Owner's Insurance Company and local Fire Protection Authority. Mount copy of inspection record in lexan enclosed frame assembly on control panel.

E. Warranty:

1. The contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from date of the completed and certified test or from the date of the first beneficial use.
2. The equipment manufacturer shall make available to the Owner, a maintenance contract proposal to provide a minimum of two (2) inspections and tests per year in compliance with NFPA-72 guidelines.

END OF SECTION 28 31 11



Engineering Design Associates, Inc.
 385 12th Street, N.E.
 Sioux Center, IA 51250
 Phone: 712-722-0228
 Fax: 712-722-0238
 www.edaengineers.com

To All Persons Requesting Files:

At your request, EDA Inc. will provide electronic files for your convenience and use in the preparation of shop drawings related to **Central Lyon CSD Elementary School Restroom/Locker Room Remodel - Phase 2, Rock Rapids, Iowa**, subject to the following terms and conditions:

Our electronic files are generated with AutoCAD software, EDA Inc. makes no representation as to the compatibility of these files with your hardware or your software. Please advise EDA Inc. of the desired AutoCAD version you are requesting.

Data contained on these electronic files are part of our instruments of service and shall not be used by you for any purpose other than as a convenience in the preparation of the shop drawings and/or for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to EDA Inc. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against EDA Inc., our officers, directors, employees, agents or sub-consultants that may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold EDA Inc. harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. EDA Inc. makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents, the signed or sealed hard-copy shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions, coordinate your work with that of other contractors for the project and verify all addendum and RFP information.

Because information presented on the electronic files can be modified, unintentionally or otherwise, EDA Inc. reserves the right to remove all indicia of ownership and/or involvement from each electronic display.

EDA Inc. will furnish your electronic files of the following drawings sheets:

List of Requested Drawings

AutoCAD Version (ie. AutoCAD 2000i, AutoCAD R14, etc.)

	Total Number of Requested Sheets
X \$100.00	Per Drawing Charge
	Total Service Fee

The service fee as outlined above shall be remitted to EDA Inc. prior to delivery of the electronic files.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by EDA Inc. and we make no warranties, either express or implied, or merchantability and fitness for any particular purpose. In no event shall EDA Inc. be liable for any loss of profit or any consequential damages as a result of your use or reuse of the electronic files.

(Contractor/Representative Name and Title)

(E-Mail Address)