

PROJECT MANUAL

**VOLUME 1 OF 1
SPECIFICATION DIVISION 00-14**

JOHNSON COUNTY RECYCLING CENTER

PREPARED FOR:

JOHNSON COUNTY, INDIANA

DATE: APRIL 22, 2024



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LETTER OF INSTRUCTIONS

PROJECT NAME: JOHNSON COUNTY RECYCLING CENTER

**ALL REQUESTS FOR INFORMATION DURING THE
BIDDING PROCESS SHALL BE SUBMITTED IN
WRITING BY EMAIL TO:
mbelyayev@lancerarchitects.com**

Misha Belyayev is also available at phone number 317-748-3664.

END OF LETTER OF INSTRUCTIONS

JOHNSON COUNTY RECYCLING CENTER

DOCUMENT 00 11 13

NOTICE TO BIDDERS

NOTICE is hereby given that sealed bids will be received as follows:

BY: JOHNSON COUNTY SOLID WASTE MANAGEMENT DISTRICT (the
“District”), acting by and through its Board of Directors
900 Arvin Dr., Ste. A
Franklin, IN 46131

FOR: CONSTRUCTION OF JOHNSON COUNTY RECYCLING CENTER

Sealed bids may be delivered and will be received by:

OFFICE OF THE AUDITOR OF JOHNSON COUNTY
86 West Court Street
Franklin, IN 46131

until June 10, 2024, at 10:00 A.M. local time, at which time bids will be opened and publicly read aloud at a public meeting held in the Johnson County Courthouse West Annex Auditorium, 86 W. Court St., Franklin, IN 46131. Bids received after the date and time set for receipt and opening of bids as herein indicated will be returned to the bidder unopened.

Bids will be received for a single prime contract, which will include sitework and construction of an expandable building to house offices of the District and a teacher resource center for recycling purposes. The work will also include, without limitation, the paving of a parking lot/drive, the relocation of one or more utility poles, the installation of a passing blister on a public roadway. All work must be performed per the Construction Documents provided, which are now on file with the Owner or with the Architect and may be examined by prospective Bidders at the following locations:

Dodge Data & Analytics
Website: www.construction.com
Email: support@construction.com
Phone: 800-393-6343

Construct Connect
3825 Edwards Rd., Suite 800
Cincinnati, OH 45209
Phone: 800-364-2059
Website: www.constructconnect.com

BX Indiana
1028 Shelby Street
Indianapolis, IN 46203
Phone: 317-423-7080
Fax: 317-423-7094
projects@buildingex.com

BidTool
Construction Data Company Inc.
4201 W. Parmer Lane, Ste A200
Austin, TX 78727
Phone: 888-506-7613
plans@bidtool.net

JOHNSON COUNTY RECYCLING CENTER

ISQFT – Construction Software Technology
The Rockwood Exchange
3825 Edwards Rd, Suite 800
Cincinnati, Ohio 45209
Phone: 800-364-2059

Bidders may obtain complete sets of Construction Documents from Reprographix, 437 N. Illinois Street, Indianapolis, IN 46204, Phone: 317-637-3377; www.reprographix.com .

Paper and Digital Files (PDFs) of the drawings and specs are available for purchase.

Bids shall include BID SECURITY in the form of a Bid Bond or certified check in the amount of a sum no less than five (5) percent of the Bid Sum.

BIDDERS are urged to attend a pre-bid conference with representatives of the Owner and Architect to discuss the project and related requirements. The pre-bid conference will be held on May 28, 2024, at 2:00 P.M. local time at the Johnson County Courthouse West Annex meeting room, 86 W. Court St., Franklin, IN 46131.

The Owner reserves the right to accept or reject any or all bids and to waive any formalities or irregularities in the bidding process or any bid. Base bids may be held for the following period before award of Contract: Ninety (90) Days.

All applicable laws, ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the project throughout. The Owner reserves the right to reject any bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the Project and to complete the work contemplated therein.

Should a successful Bidder withdraw his bid or fail to satisfactorily execute all the requirements and enter a written Contract within ten (10) days after Notice of Acceptance of his bid, the Owner may declare the Bid Security forfeited, not as a penalty, but as liquidated damages.

The successful Bidder shall furnish a Performance Bond and Payment Bond from an approved surety company, which will remain in full force and effect for a period of one (1) year after the date of final acceptance of work. The Performance Bond and Payment Bond shall be in an amount equal to the following percentage of the Contract Sum: One hundred percent (100%) guaranteeing faithful and proper performance of the work and materials, to be executed by an acceptable surety company.

Published in the Johnson County Daily Journal two (2) times on May 7, 2024, and May 15, 2024.

END OF DOCUMENT

DOCUMENT 00 21 13

INSTRUCTIONS TO BIDDERS

1.1 INTENT

- A. The intent of this Bid request is to obtain an offer for each project to perform work to complete the project for a Stipulated Sum contract, in accordance with Contract Documents.

1.2 CONTRACT TIME

- A. Bidders shall insert the number of days required for construction on the Bid Form.

1.3 DEFINITIONS

- A. Bidding Documents: Contract Documents supplemented with Notice to Bidders, Instructions to Bidders, Bid Form, Bid Form Supplements and Appendices, and bid securities, identified.
- B. Bid: Executed Bid Form and required attachments submitted in accordance with these Instructions to Bidders.
- C. Bid Sum: Monetary sum identified by the Bidder in the Bid Form.

1.4 CONTRACT DOCUMENTS IDENTIFICATION

- A. The Contract Documents are identified as Project number 23122 as prepared by LANCER ASSOCIATES located at 145 North East Street, Indianapolis, IN 46204.

1.5 AVAILABILITY OF DOCUMENTS

- A. Bidding Documents may be obtained as stated in Notice to Bidders.
- B. Bidding Documents are made available only for the purpose of obtaining offers for this Project. Their use does not grant a license for other purposes.

1.6 INQUIRIES AND ADDENDA

- A. Direct questions in writing by email to mbelyayev@lancerarchitects.com
- B. Verbal answers are not binding on any party.
- C. Submit questions not less than 10 days before date set for receipt of Bids. Replies will be made by Addenda.
- D. Addenda may be issued during bidding period. Addenda will be sent to known Bidders. Addenda become part of the Contract Documents. Include resultant costs in the Bid Sum.

1.7 PRODUCT SUBSTITUTIONS

- A. Where Bidding Documents stipulate particular Products, substitution requests will be considered by Architect/Engineer up to 10 days before receipt of Bids.
- B. With each substitution request, provide sufficient information for Architect to determine acceptability of proposed products.
- C. When a request to substitute a Product is made, Architect may approve the substitution. Approved substitutions will be identified by Addenda.
- D. In submission of substitutions to Products specified, Bidders shall include in their Bid, changes required in the Work and changes to Contract Time and Contract Sum to accommodate such approved substitutions. Later claims by the Bidder for an addition to the Contract Time or Contract Sum because of changes in Work necessitated by use of substitutions will not be considered.
- E. A request constitutes a representation that Bidder:
 - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
 - 2. Will provide same warranty for Substitution as for specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Architect/Engineer for review or redesign services associated with re-approval by authorities having jurisdiction.
 - 6. The product shall be readily available in sufficient quantity to prevent delay of any work, available in the same range of colors, textures, dimensions, gages, types, and finishes as the material specified.
 - 7. The product shall be equal in strength, durability, efficiency, serviceability, ease and cost of maintenance and compatible with the building design and not necessitate design modifications by the Architect/Engineer nor impose additional work of require changes in the work.

1.8 SITE EXAMINATION

- A. Examine Project site before submitting a Bid.
- B. Contact the Owner to arrange date and time to visit Project site:
- C. No claims for extra compensation shall be allowed due to failure of any Bidder to examine conditions which exist at the building site nor for conditions of difficulties encountered in execution of work which may have been avoided by such examination.

1.9 SUBCONTRACTORS

- A. The Owner reserves the right to reject a proposed Subcontractor for reasonable cause.

- B. Refer to AIA Document A201-2007, Article 5 of General Conditions.

1.10 SUBMISSION PROCEDURE

- A. Bidders shall be solely responsible for delivery of Bids in manner and time prescribed.
- B. Submit two copies of executed offer on Bid Forms provided, signed and sealed with required security deposit in a closed opaque envelope, clearly identified with Bidder's name, Project name, and Owner's name on the outside.
- C. The following items must be included with the Bid:
 - 1. Bid Security.
 - 2. Form No. 96 (Revised 2013) Contractor's Bid for Public Work
 - 3. Document 00 41 13 Bid Form – Stipulated Price
 - 4. Written drug testing plan that covers all employees of the bidder who will perform work on the public works project and meets or exceeds the requirements of IC 4-13-18-5 or IC 4-13-18-6.
- D. An abstract summary of submitted Bids will be made available to all Bidders following bid opening.

1.11 BID INELIGIBILITY

- A. Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may be declared unacceptable at Owner's discretion.
- B. Bid Forms, Appendices, and enclosures which are improperly prepared may be declared unacceptable at Owner's discretion.
- C. Failure to provide security deposit, bonds or insurance requirements may invalidate the Bid at the discretion of the Owner.

1.12 SECURITY DEPOSIT

- A. Bids shall be accompanied by security deposit as follows:
 - 1. Bid Bond or certified check in the amount of a sum no less than 5 percent of the Bid Sum plus all add alternates on AIA Document A310 - Bid Bond.
- B. Endorse Bid Bond or certified check in name of the Owner as obligee, signed and sealed by the principal (Contractor) and surety.
- C. Security deposit of accepted Bidder will be returned after delivery to the Owner of the required Performance and Payment Bonds by the accepted Bidder.
- D. Include the cost of security deposit in the Bid Sum.
- E. After a Bid has been accepted, security deposits will be returned to the respective Bidders.

F. If no contract is awarded, security deposits will be returned.

1.13 PERFORMANCE ASSURANCE

- A. Accepted Bidder: Provide a Performance and Payment bond as described in Document 00811 - Supplementary Conditions.
- B. Include the cost of performance assurance bonds in the Bid Sum and identify the cost when requested by the Owner.

1.14 BID FORM REQUIREMENTS

- A. Complete requested information in the Bid Form and Bid Form Supplements.

1.15 TAX EXEMPTION

- A. Materials supplied for this project are exempt from Indiana State sales tax.

1.16 BID FORM SIGNATURE

- A. Sign Bid Form, as follows:
 - 1. Sole Proprietorship: Signature of sole proprietor in the presence of a witness who will also sign. Insert the words "Sole Proprietor" under the signature. [Affix seal.]
 - 2. Partnership: Signature of all partners in the presence of a witness who will also sign. Insert the word "Partner" under each signature. [Affix seal to each signature.]
 - 3. Corporation: Signature of a duly authorized signing officers in their normal signatures. Insert the officer's capacity in which the signing officer acts, under each signature. Affix the corporate seal. If the Bid is signed by officials other than the president and secretary of the company, or the president/secretary/treasurer of the company, submit a copy of the by-law resolution of their board of directors authorizing them to do so, with the Bid Form in the bid envelope.
 - 4. Joint Venture: Signature of each party of the joint venture under their respective seals in a manner appropriate to such party as described above, similar to requirements for Partnerships.

1.17 DURATION OF OFFER

- A. Bids shall remain open to acceptance and shall be irrevocable for a period of 90 days after bid closing date.

1.18 ACCEPTANCE OF OFFER

- A. The Owner reserves the right to accept or reject any or all offers.
- B. After acceptance by the Owner, the Architect on behalf of the Owner, will issue to the accepted Bidder, a written Letter of Intent.

- C. Notwithstanding delay in the preparation and execution of the Agreement, accepted Bidder shall be prepared, upon written Notice to Proceed, to commence work within seven days following receipt of official written order of the Owner to proceed, or on date stipulated in such order.
- D. The accepted bidder shall assist and cooperate with the Owner to prepare the Agreement, and within 7 days following its presentation shall execute Agreement and return it to the Owner.

END OF DOCUMENT

DOCUMENT 00 31 32

INFORMATION AVAILABLE TO BIDDERS

1.1 SUMMARY

- A. Document Includes:
 - 1. Subsurface investigation report.

1.2 SUBSURFACE INVESTIGATION REPORT

- A. A copy of a geotechnical report is included with this document.
- B. This report identifies properties of below grade conditions and offers recommendations for design of foundations, prepared primarily for use of Architect/Engineer.
- C. Recommendations described are not requirements of this Contract, unless specifically referenced in Contract Documents.
- D. This report, by its nature, cannot reveal all conditions existing on the site. Should subsurface conditions be found to vary substantially from this report, changes in design and construction of foundations will be made, with resulting credits or expenditures to Contract Price/Sum accruing to Owner.

END OF DOCUMENT



CONTRACTOR'S BID FOR PUBLIC WORK - FORM 96

State Form 52414 (R2 / 2-13) / Form 96 (Revised 2013)
Prescribed by State Board of Accounts

PART I

(To be completed for all bids. Please type or print)

Date (month, day, year): _____

1. Governmental Unit (Owner): _____

2. County : _____

3. Bidder (Firm): _____

Address: _____

City/State/ZIPcode: _____

4. Telephone Number: _____

5. Agent of Bidder (if applicable): _____

Pursuant to notices given, the undersigned offers to furnish labor and/or material necessary to complete the public works project of _____
(Governmental Unit) in accordance with plans and specifications prepared by _____
_____ and dated _____ for the sum of
_____ \$ _____

The undersigned further agrees to furnish a bond or certified check with this bid for an amount specified in the notice of the letting. If alternative bids apply, the undersigned submits a proposal for each in accordance with the notice. Any addendums attached will be specifically referenced at the applicable page.

If additional units of material included in the contract are needed, the cost of units must be the same as that shown in the original contract if accepted by the governmental unit. If the bid is to be awarded on a unit basis, the itemization of the units shall be shown on a separate attachment.

The contractor and his subcontractors, if any, shall not discriminate against or intimidate any employee, or applicant for employment, to be employed in the performance of this contract, with respect to any matter directly or indirectly related to employment because of race, religion, color, sex, national origin or ancestry. Breach of this covenant may be regarded as a material breach of the contract.

CERTIFICATION OF USE OF UNITED STATES STEEL PRODUCTS *(If applicable)*

I, the undersigned bidder or agent as a contractor on a public works project, understand my statutory obligation to use steel products made in the United States (I.C. 5-16-8-2). I hereby certify that I and all subcontractors employed by me for this project will use U.S. steel products on this project if awarded. I understand that violations hereunder may result in forfeiture of contractual payments.

ACCEPTANCE

The above bid is accepted this _____ day of _____, _____, subject to the following conditions: _____

Contracting Authority Members:

PART II

(For projects of \$150,000 or more – IC 36-1-12-4)

Governmental Unit: _____

Bidder (Firm) _____

Date (month, day, year): _____

These statements to be submitted under oath by each bidder with and as a part of his bid. Attach additional pages for each section as needed.

SECTION I EXPERIENCE QUESTIONNAIRE

1. What public works projects has your organization completed for the period of one (1) year prior to the date of the current bid?

Contract Amount	Class of Work	Completion Date	Name and Address of Owner

2. What public works projects are now in process of construction by your organization?

Contract Amount	Class of Work	Expected Completion Date	Name and Address of Owner

3. Have you ever failed to complete any work awarded to you? _____ If so, where and why?

4. List references from private firms for which you have performed work.

SECTION II PLAN AND EQUIPMENT QUESTIONNAIRE

1. Explain your plan or layout for performing proposed work. *(Examples could include a narrative of when you could begin work, complete the project, number of workers, etc. and any other information which you believe would enable the governmental unit to consider your bid.)*

2. Please list the names and addresses of all subcontractors *(i.e. persons or firms outside your own firm who have performed part of the work)* that you have used on public works projects during the past five (5) years along with a brief description of the work done by each subcontractor.

3. If you intend to sublet any portion of the work, state the name and address of each subcontractor, equipment to be used by the subcontractor, and whether you will require a bond. However, if you are unable to currently provide a listing, please understand a listing must be provided prior to contract approval. Until the completion of the proposed project, you are under a continuing obligation to immediately notify the governmental unit in the event that you subsequently determine that you will use a subcontractor on the proposed project.

4. What equipment do you have available to use for the proposed project? Any equipment to be used by subcontractors may also be required to be listed by the governmental unit.

5. Have you entered into contracts or received offers for all materials which substantiate the prices used in preparing your proposal? If not, please explain the rationale used which would corroborate the prices listed.

SECTION III CONTRACTOR'S FINANCIAL STATEMENT

Attachment of bidder's financial statement is mandatory. Any bid submitted without said financial statement as required by statute shall thereby be rendered invalid. The financial statement provided hereunder to the governing body awarding the contract must be specific enough in detail so that said governing body can make a proper determination of the bidder's capability for completing the project if awarded.

BID OF

(Contractor)

(Address)

**FOR
PUBLIC WORKS PROJECTS
OF**

Filed _____,

Action taken _____

DOCUMENT 00 41 13

BID FORM - STIPULATED PRICE

To: JOHNSON COUNTY, INDIANA, acting by and through its Board of Commissioners

Project: NEW JOHNSON COUNTY RECYCLING CENTER

Date:

Submitted by:
(full name)

(full address)
.....

(phone number).....

1. OFFER

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by LANCER ASSOCIATES for the above mentioned project, we, the undersigned, having become thoroughly familiar with the terms and conditions of the proposed Contract Documents and with local conditions affecting the performance and costs of the work at the place where the Work is to be completed, and having fully inspected the site in all particulars, hereby offer to enter into a Contract to perform the Work for the Sum of:

BASE BID:

.....
.....\$.....dollars, in lawful money of the United States of America.

An \$50,000 contingency allowance as described in Section 01200 - Price and Payment Procedures is included in the Base Bid above.

ALTERNATES:

Alternate No. 1: **(Add radiant floor heating system)**
LUMP SUM ADD.....\$.....dollars

Alternate No. 2: **(Add mezzanine)**
LUMP SUM ADD.....\$.....dollars

We have included, the security deposit or Bid Bond as required by the Instruction to Bidders.

All applicable taxes are included in the Bid Sum.

2. ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for ninety days from the bid closing date.

If this bid is accepted by the Owner within the time period stated above, we will:

- Execute the Agreement within seven days of receipt of Notice of Award.
- Furnish the required bonds within seven days of receipt of Notice of Award.
- Commence work within seven days after written Notice to Proceed.

If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required bonds, the security deposit shall be forfeited as damages to the 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.

In the event our bid is not accepted within the time stated above, the required security deposit will 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.

3. CONTRACT TIME

If awarded this contract, we will complete construction in 240 calendar days from Notice to Proceed.

5. ADDENDA

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.

Addendum # Dated

Addendum # Dated

Addendum # Dated

Addendum # Dated

Addendum # Dated

6. APPENDICES

The following documents are attached to and made a condition of the Bid:

Bid security in form of

7. BID FORM SIGNATURES

.....
(Bidder - print the full name of your firm)
was hereunto affixed in the presence of:

.....
(Authorized signing officer Title)

(Seal)

.....
(Authorized signing officer Title)

(Seal)

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

END OF DOCUMENT

Compliance Affidavit
Regarding IC 4-13-18 - Drug Testing of Employees of Public Works Contractors

AFFIDAVIT

The undersigned, being duly sworn, hereby affirms and says that:

1. The undersigned is the _____ of _____.
Job Title Company Name
2. The undersigned is duly authorized and has full authority to execute this Affidavit.
3. The company named herein that employs the undersigned:
 - ii. Has contracted or is seeking to contract with the Johnson County Solid Waste Management District to provide services, **OR**
 - iii. Is a subcontractor on a contract to provide services to the Johnson County Solid Waste Management District.
4. The undersigned certifies that Contractor's submitted written plan for a drug testing program to test employees of the Contractor and Subcontractor for public works projects with an estimated cost of \$150,000 is in accordance with IC 4-13-18 as amended.
5. The undersigned acknowledges that this Contract shall be subject to cancellation should Contractor fail to comply with all provisions of the statute.

Signature

Printed Name

STATE OF INDIANA)
) SS:
COUNTY OF: _____)

Before me, a Notary Public in and for said County and state, personally appeared _____ and acknowledged the execution of the foregoing this ____ day of _____, 20____.

My Commission Expires: _____

Notary Public's Signature

County of Residence: _____

Printed Name of Notary Public

My Commission Number: _____

Certification Regarding Investment Activities in Iran

AFFIDAVIT

The undersigned, certifies under penalties of perjury, pursuant to Indiana Code 5-22-16.5 *et seq.* that

Name of Business

Is not engaged in investment activities in Iran (as defined by IC 5-22-16.2-8). The undersigned further acknowledges that false certification may result in the consequences enumerated in IC 5-22-16.5-14.

Signature

Printed Name

STATE OF INDIANA)
) SS:
COUNTY OF: _____)

Before me, a Notary Public in and for said County and state, personally appeared _____ and acknowledged the execution of the foregoing this ____ day of _____, 20____.

My Commission Expires: _____

Notary Public's Signature

County of Residence: _____

Printed Name of Notary Public

My Commission Number: _____

DOCUMENT 00 43 36

BID FORM SUPPLEMENTS

To: JOHNSON COUNTY, INDIANA, acting by and through its Board of Commissioners

Project: NEW JOHNSON COUNTY RECYCLING CENTER

Date:

Submitted by:
(full name)

(full address)
.....

In accordance with the Instructions to Bidders, we include the Appendices to Bid Form Supplements listed below. The information provided shall be considered an integral part of the Bid Form. The following Appendices are attached to this document:

Appendix A – Subcontractors and Materials List:

BID FORM SUPPLEMENTS SIGNATURES

The Corporate Seal of

.....
(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

.....
(Authorized signing officer Title)

(Seal)

.....
(Authorized signing officer Title)

(Seal)

APPENDIX A – SUBCONTRACTORS AND MATERIALS LIST

Herewith is the list of subcontractors referenced in the bid submitted by:

(Bidder)

To (Owner) JOHNSON COUNTY RECYCLING CENTER

Dated and which is an integral part of the Bid Form.

The two apparent low bidders for General Construction shall submit, in duplicate, completed Subcontractors and Materials List within 24 hours following bid receipt date.

The Owner and Architect/Engineer have the right to choose the Subcontractor, Material or Equipment for any particular item where the Bidder fails to list same.

When products are named and a list of acceptable manufacturers is included in the specifications, Bidders shall select one of the named manufacturers in his Subcontractors and Materials List.

After the submission and approval of this Subcontractors and Materials List by the Architect/Engineer and the Owner, the Contractor shall make no changes or alterations without the written approval of the Architect/Engineer and the Owner.

The following work will be performed (or provided) by subcontractors and coordinated by us:

MATERIAL AND/OR EQUIPMENT	MANUFACTURER	SUPPLIER	INSTALLER
Sitework			
Paving			
Cast-In-Place Concrete			
Firestopping			
Joint Sealers			
Steel Doors			
Steel Frames			
Flush Wood Doors			
Overhead Doors			
Aluminum Storefront			
Hardware			
Glazing			
Gypsum Board Assemblies			
Carpet Tile			
Tiling			
Acoustical Ceilings			
Resilient Flooring			
Paints and Coatings			
Toilet Accessories			

JOHNSON COUNTY RECYCLING CENTER

Plastic Laminate Casework			
Pre-Engineered Metal Building System			

END OF DOCUMENT

DOCUMENT 00 52 13

AGREEMENT

1.1 SUMMARY

- A. Document Includes:
 - 1. Agreement.

1.2 AGREEMENT

- A. AIA Document, Standard Form of Agreement between Owner and Contractor Where the Basis of Payment is a Stipulated Sum, forms the basis of Agreement between the Owner and Contractor.

END OF DOCUMENT

DOCUMENT 00 72 00

GENERAL CONDITIONS - AIA

1.1 SUMMARY

- A. Document Includes:
 - 1. General Conditions.

1.2 GENERAL CONDITIONS

- A. AIA Document A201-2017, General Conditions of the Contract for Construction, is the General Conditions of the Contract.

1.3 SUPPLEMENTARY CONDITIONS

- A. Refer to Document 00 73 00 for modifications to General Conditions.

END OF DOCUMENT

DOCUMENT 00 73 00

SUPPLEMENTARY CONDITIONS

1.1 SUMMARY

- A. Document Includes:
 - 1. Supplementary Conditions.

1.2 SUPPLEMENTARY CONDITIONS

- A. These Supplementary Conditions modify the General Conditions of the Contract for Construction, AIA Document A201-2017, and other provisions of the Contract Documents as indicated below. All provisions which are not so modified remain in full force and effect.
- B. The terms used in these Supplementary Conditions which are defined in the General Conditions of the Contract for Construction, AIA Document A201-2017, have the meanings assigned to them in the General Conditions.

Article 1 - Contract Documents

- 1. Add the following Subparagraph 1.1.5.1 as follows:

1.1.5.1- In general, mechanical and electrical drawings are diagrammatic and schematic, and cannot indicate every offset, fitting, and accessory required to avoid all conflict with other trades. Contractor shall check drawings of other trades to verify spaces available and make reasonable modifications, as directed, without extra cost to Owner; maintain headroom and other requirements in all areas; and where such requirements appear inadequate, notify Architect/Engineer before proceeding.

- 2. Add a new Subparagraph 1.2.4 as follows:

1.2.4 Contractor also represents that he has studied all surveys and investigation reports of subsurface and latent physical conditions referred to in the Contract Documents and have made such additional surveys and investigations necessary for the performance of the Work at the Contract Sum and in accordance with the requirements of the Contract Documents, and results of all such data with the requirements of the Contract Documents, and that the Contractor enters into the Contract on the basis of its own examination, investigation and evaluation of all such matters and risks associated with the Work, and not in reliance upon any opinions, statements or representations of the Owner or Architect or any of their respective officers, agents, servants or employees.

- 3. Add a new Subparagraph 1.2.5 as follows:

1.2.5 Contractor represents that he has familiarized himself with, and assumes full responsibility for having familiarized himself with the type, nature, sources, availability and compatibility of all material, systems, products, and equipment specified or which have been

proposed or approved as substitutions prior to the execution of the Contract.

4. Add a new Subparagraph 1.2.6 as follows:

1.2.6 "The specifications are, in part, of the brief or "streamlined" type and include incomplete sentences. Omissions of words or phrases such as "The Contractor shall", "as noted on the drawings", "according to the drawings", "a", "an", "the", and "all" are intentional. Omitted words or phrases shall be supplied by reference in the same manner as they are when "note" occurs on the drawings. Words "shall" or "shall be" shall be supplied by inference where a colon (:) is used within sentences or phrases. Words "as per" shall mean "in accordance with". Words "provide" and "work" shall mean furnish, install and connect up complete, in operative conditions and use, all materials, equipment, apparatus and required appurtenances of the particular item to which it has reference. Whenever words "approved", "satisfactory", "directed", "submitted", "inspected", or similar words or phrases are used, it shall be assumed that the word "Architect" follows the verb as the object of the clause, such as "approved by the Architect" and "submitted to the Architect". Where a manufacturer's name is mentioned, words "as manufactured by" or "as made by" shall be understood.

5. Add a new Subparagraph 1.2.7 as follows:

1.2.7 Contractor shall promptly call to the attention of the Owner and Architect any discrepancy or conflict in figures, Drawings, or Specifications that affect its Work. In the event of conflicts or discrepancies between and among the Contract Documents, the Architect shall determine which takes precedence over the other. However, figure dimensions shall take precedence over scale measurements, large scale details shall take precedence over small scale drawings, and drawings of later date shall take precedence over those of earlier date. Any part of the Work shown on the Drawings but not specifically mentioned in the Specifications, or vice versa, shall be considered as part of the Work, the same as though included in both. In the event of an inconsistency or conflict between Drawings and Specifications, or within either document not clarified by addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation.

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Likewise, the work to be undertaken by Contractor shall include all incidental work necessary as customarily done for the completion of the Project even though it may not be specifically described in the Specifications or Drawings.

6. Add a new Subparagraph 1.2.8 as follows:

1.2.8 In the event of conflicts or discrepancies among the Contract documents, interpretations will be based on the following priorities.

1. The Agreement.
2. Addenda, with those of later date having precedence over those of earlier date.
3. The Supplementary Conditions.
4. The General Conditions of the Contract for Construction.
5. Drawings and Specifications.

In the case of an inconsistency between Drawings and Specifications or within either Document not clarified by Addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation, in every case the more expensive item or method specified or shown shall be figured over any less expensive one. Written dimensions shall be used rather than determined by scale or rule.

7. Add a new Subparagraph 1.2.9 as follows:

1.2.9 Where reference to codes and standards of technical associations and organizations are made in the Contract Documents, the current edition of such codes and standards shall govern unless specified edition dates are included.

8. Add a new Subparagraph 1.2.10 as follows:

1.2.10 The Drawings, Plans and Specifications for the Work and the Project have been prepared for the Owner by the Architect and, accordingly, the Owner makes any express or implied warranty representing the suitability, adequacy, or accuracy thereof.

Article 2 - Owner

1. Modify Subparagraph 2.3.1 by adding the following sentence to the end thereof:

2.3.1 Contractor shall have no right of action or claim as against the Owner or Architect for or on account of orders or directives for work stoppage if given in good faith upon reasonable belief that sufficient grounds exist therefor.

Article 3 - Contractor

1. Add a new Subparagraph 3.3.1.1 as follows:

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3.3.1.1 Contractor shall provide and maintain, in full operation at all times during the performance of the Contract, a sufficient crew of laborers, mechanics and foremen to prosecute the Work with dispatch. The Contractor shall provide a full-time superintendent who shall be on the job during all working periods. Additional provisions pertaining to coordination are included in Division 1, General Requirements, of the Specifications.

2. Add a new Subparagraph 3.4.4 as follows:

3.4.4 Labor shall be performed in a workmanlike manner, by mechanics skilled in their respective trades. Standards of Work required throughout shall be of such grade as will bring results of good workmanship. Mechanics whose Work is unsatisfactory to the Owner or Architect, or are considered by either Owner or Architect to be careless, incompetent, unskilled or otherwise objectionable, shall be dismissed from the Work upon notice from the Architect or Owner. Neither the Owner nor Architect shall be responsible for any increased costs of delays caused by such a dismissal.

3. Add a new Subparagraph 3.4.5 as follows:

3.4.5 The Contractor shall perform a criminal history check for all workers including all subcontractors prior to starting work on the project. A list of workers who have successfully passed the criminal history check and who will be working on the project shall be provided to the Owner's representative. Only persons who have successfully passed the criminal history check will be allowed to work on the project. The Contractor and all subcontractors shall provide written verification to the Owner's representative that all persons working on the project have completed and filed valid I-9 forms and are eligible for employment on the project. No person will be employed by the contractor or any subcontractor that have been found to be the perpetrator of sexual or physical abuse of a minor under the age of 18 years of age; including but not limited to a conviction for any of the following felonies: kidnapping, criminal confinement, rape, criminal deviate conduct, child molesting, child exploitation, vicarious sexual gratification, child solicitation, child seduction, sexual misconduct with a minor or incest. No person shall be employed by and the contractor or any subcontractor that has been convicted of: dealing in or manufacturing cocaine, a narcotic drug or methamphetamine, dealing in a schedule I, II, or III controlled substance as defined by IC-35-48-4-2, dealing in a schedule IV controlled substance as defined by IC 35-48-4-3, dealing in a schedule V controlled substance as defined by IC 35-48-4-4, dealing in a counterfeit substance as defined by IC 35-48-4-10(b) or possession of marijuana, cocaine, a narcotic drug or methamphetamine. The Contractor shall at all times enforce strict discipline at the site and shall remove from the site any persons found by the Owner or Architect to be disorderly, disruptive to the orderly and efficient progress of the Work, or otherwise exhibiting conduct not in compliance with the Contract Documents. Neither the Owner nor Architect shall be responsible for any increased costs or delays caused by such removal.

4. Add a new Subparagraph 3.4.6 as follows:

3.4.6 All labor used throughout the Work and in performance of the Contract shall be acceptable to the Owner and of a standing or affiliation that will permit the Work to be carried on harmoniously and without delay, and that will in no case or under any circumstances cause any disturbance, interference or delay to the progress of the Work. Contractor agrees to proceed with its Work without interruption, regardless of any trade or craft affiliations or the lack thereof on the part of any workmen on the Project.

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Contractor agrees that where its Work is stopped or delayed or interfered with by strikes, slowdowns or work interruptions resulting from the acts or failures to act of its employees in concert, or by the breach of any of the terms of this provision, then the Owner, at its option, may terminate the Contract and proceed in accordance with the Contractual Documents.

5. Add a new Subparagraph 3.4.7 as follows:

3.4.7 Contractor shall be obligated to perform all work designated by the Owner or Architect as work included within the scope of the Contract Documents notwithstanding a dispute or claim by the Contractor that such work constitutes extra or additional work.

6. Add the following Subparagraphs 3.4.8 and 3.4.9 to 3.4:

- a. 3.4.8 After the Contract has been executed, the Owner and the Architect will consider a formal request of the substitution of products in place of those specified only under the conditions set forth in the General Requirements (Division 1 of the Specifications). Refer to Section 01631.
- b. 3.4.9 By making requests for substitutions based on Subparagraph 3.4.8 above, the Contractor:
 1. represents that the Contractor has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
 2. represents that the Contractor will provide the same warranty for the substitution that the Contractor would for that specified;
 3. certifies that the cost data presented is complete and includes all related costs under his Contract except the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently become apparent; and
 4. will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be completed in all respects.
 5. time required by the Architect to review the Contractor's request for substitution shall be compensated by the Contractor through the Owner. Compensation will be on an hourly basis per the Architect's current labor rate schedule for employees involved in the review of the request.

7. Change the second sentence of Subparagraph 3.5.1 to read as follows:

3.5.1 All Work not conforming to these requirements, including substitutions not: properly approved and authorized, shall be considered defective.

8. Add new Subparagraphs 3.5.2 through 3.5.12 as follows:

- a. 3.5.2 For a period of one year from the date of final completion and acceptance of the Work by the Owner, as evidenced by the date of the Architect's Certificate of Completion, the Contractor warrants to the Owner all movable windows, apparatus, machinery, mechanical and electrical equipment. For the same period, the Contractor warrants to Owner to make good, at his own expense, any defects, shrinkages, warpages or other faults in Work required under this Contract arising out of defective materials or workmanship, ordinary wear and tear excepted.
- b. 3.5.3 As part of the above warranty, it is expressly understood and agreed that the Contractor warrants that the Contractor's portion of the Work shall be

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- waterproof and weatherproof in every respect.
- c. 3.5.4 The Contractor warrants and represents to the Owner that the Drawings and Specifications for the Work are suitable and adapted for said Work, and guarantees the sufficiency of said Drawings and Specifications for their intended purpose and agrees that it will perform said construction work and complete same to the entire satisfaction of the Owner and Architect.
 - d. 3.5.5 The commencement and terms for the guarantees and warranties provided and required by the Contract Documents shall not in any manner be affected by any delay in the commencement, progress or completion of the Work, regardless of the cause therefor.
 - e. 3.5.6 In addition to all of Contractor's warranties and obligations to correct defective Work provided by law or as set forth in any of the Contract Documents, the Contractor agrees, upon notice from Owner or Architect, immediately to repair, restore, correct and cure, at Contractor's expense, all defects and omissions in workmanship and materials and all failures to comply with the Contract Documents which appear within one (1) year from the date of final completion and acceptance of Work by Owner. Contractor shall pay for, and if requested, correct, repair, restore and cure any damage or injury, whenever the same shall occur or appear, resulting from any defects, omissions or failure in workmanship and materials, and indemnify, hold harmless, and defend Owner against any and all claims, losses, costs, damages and expenses, including attorney's fees, suffered by Owner as a result of such damage or injury, whenever such damage or injury shall occur or appear.
 - f. 3.5.7 The foregoing guarantees and warranties shall not shorten any longer warranty or liability period provided for by law or in the plans, drawings or specifications or otherwise received from Contractor or any subcontractor, material supplier or manufacturer of Contractor nor supersede the terms of any liability for defective Work, but shall be in addition thereto, and shall be in addition to all manufacturer's and factory warranties.
 - g. 3.5.8 Notwithstanding anything to the contrary contained herein with respect to warranties, it is understood and agreed that the foregoing warranties and guarantees shall not affect, limit or impair Owner's right against Contractor with regard to latent defects in the Work which do not appear within the applicable warranty period following acceptance of the Work and which could not, by the exercise of reasonable care and due diligence, be ascertained or discovered by Owner within such warranty period. Contractor shall be and remain liable and responsible to correct and cure any such latent defects which are reported to Contractor by Owner in writing within ninety (90) days after such latent defect first appears or could, by the exercise of reasonable care and due diligence, be ascertained or discovered by Owner.
 - h. 3.5.9 All guarantees or warranties upon any Work, labor, materials, or equipment by any subcontractor or material supplier of Contractor shall be deemed made by Contractor to Owner. All guarantees and warranties shall survive Owner's final acceptance of the Project. Neither the acceptance of any of the Work by Owner, in whole or in part, nor any payment, either partial or final, by Owner to Contractor, shall constitute a waiver by Owner of any claims against Contractor for defects in the Work, whether latent or apparent, and no such payment or acceptance of the Work by Owner shall release or discharge Contractor or Contractor's surety from any such claims for breach of such warranties.

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- i. 3.5.10 Nothing herein intends or implies that the guarantees or warranties shall apply to Work which has been abused or neglected by the Owner or his successor in interest.
- j. 3.5.11 Upon completion of the Work, Contractor shall furnish Owner with copies of all warranties, guarantees, operating manuals relative to equipment installed, and a complete set of reproducible drawings with all field changes noted on them relating to the improvements constructed under the Contract.
- k. 3.5.12 If required by the Owner or the Architect, the Contractor shall deliver to the Owner a signed affidavit stating that, to the best of his knowledge, the Work has been constructed in accordance with the Contract Documents. If such an affidavit is required, the Architect will not recommend final payment or issue a final certificate for payment until such affidavit has been delivered to the Owner.

9. Modify Subparagraph 3.6.1 by adding the following sentence to the end thereon:

3.6.1 The Contract Sum includes the cost of such taxes, and Owner may deduct from the Contractor's account any expense the Owner incurs because of the Contractor's failure to comply with applicable taxing laws, rules or regulations of local, state and federal authorities.

10. Add the following Subparagraph 3.6.2 as follows:

3.6.2 "Materials and properties purchased by Contracts with the Owner that become a permanent part of the structure or constructed facility are not subject to the Indiana Gross Retail Tax (Sales Tax). The Contractor shall obtain a copy of the Owner's Exemption Certificate and then issue copies of this certificate to his suppliers when acquiring materials and products for use in this project. The Contractor shall enforce this exemption clause for all of his purchases and for those of his Subcontractors."

11. Modify Subparagraph 3.7.3 as follows: At the start of this Subparagraph, insert the following:

Contractor represents and warrants that it is familiar with all governmental rules, regulations, laws and ordinances pertaining to the Work.

12. Add the following new Subparagraph 3.7.5 as follows:

3.7.5 The Contractor shall give prior notice to utility companies, make all arrangements and provide all services necessary to discontinue utilities or place same service.

13. Add the following Subparagraph 3.7.6 as follows:

3.7.6 - It is the Contractor's responsibility to perform all construction in accordance with appropriate local, state and national laws, statutes, building codes and requirements. All rated construction shall conform to the requirements of similar construction as tested by UL, or another testing organization recognized by the State of Indiana.

14. Add the following Subparagraph 3.7.7 as follows:

3.7.7 - The Contractor shall provide the owner all necessary and required signed statements that the construction is in compliance with local, state and national laws, statutes, building codes and

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requirements. These statement must be supplied prior to final payment.

15. Add the following Subparagraph 3.9.4 as follows:

3.9.4 - The Contractor shall not remove the superintendent from the project under any circumstances prior to substantial completion. Exceptions will be made for major illness, incompetence or termination with cause and even so will require the Owner's concurrence. The superintendent can not be removed prior to "Final Completion" without the consent of the Architect/Engineer and written approval of the Owner. The Superintendent shall not be allowed vacation or other time off during the last three months before substantial completion.

16. Add the following Subparagraphs 3.10.4 through 3.10.9 as follows:

- a. 3.10.4 The Owner, if deems necessary, may direct the Contractor to Work overtime, in addition to any overtime required to meet the approved progress schedule as incorporated in the Contract Documents, and if so directed Contractor shall Work said overtime. Provided that the Contractor is not in default under any of the terms or provisions of the Contract or of any of the other Contract Documents, the Contractor will be reimbursed for such actual additional wages paid, if any, at rates which have been approved by the Architect and the Owner plus taxes imposed by law on such additional wages, plus workmen's compensation insurance and levies on such additional wages if required to be paid by the Contractor.
- b. 3.10.5 The following requirements will govern in connection with such additional overtime required under Subparagraph 3.10.4. The Contractor and his Subcontractors shall be required to submit a daily statement of employees by name, trade classification, hourly rate, premium or overtime hours worked, and signed by the Owner to substantiate his premium or overtime charges, all in accordance with the Owner's and standard procedures. These changes shall be submitted weekly for the Owner's records. All such statements shall be submitted in three (3) copy form, including the original statement. The contractor will be reimbursed for the overtime premium and in addition applicable contributions to Federal and State Unemployment Tax and Federal Insurance Contributions Tax. These taxes shall be a percentage factor to be applied to the premium cost. No overhead and profit will be allowed. Each Contractor involved will be required to submit to the Owners, as promptly as possible, an itemized breakdown of the foregoing percentage and shall furnish a photostatic copy of the applicable State unemployment experience rate or a statement from the State Unemployment Security Commission setting forth said experience rate. In addition, in the case of major premium time charge, the union agreements for the trades involved shall be submitted along with the first premium time proposal. Such adjustments shall be subject to an audit by the Architect and the Owner and shall be recorded on the Contractor's books in a manner to facilitate such audit.
- c. 3.10.6 If, however, the progress of the Work or of the Project be delayed by any fault or neglect or act or failure to act of the Contractor or any of its officers, agents, servants, or employees, then the Contractor shall, in addition to all of the other obligations imposed by the Contract upon the Contractor in such cases, and at its own cost and expense, Work such overtime as may be necessary to make up for all time lost to avoid delay in the completion of the Work and of the Project.

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If, after written notice is given, the Contractor refuses to Work overtime required to make up lost time or to avoid delay in the completion of the Work and of the Project, the Owner may hire others to perform the Work and deduct the cost from the Contractor's Contract amount.

- d. 3.10.7 Should the progress of the Work or of the Project be delayed by any fault or neglect or act or failure to act of the Contractor or any of its officers, agents, servants or employees so as to cause any additional cost, expense, liability or damage to the Owner or Architect, or any damages or additional costs or expenses for which the owner, or Architect may or shall become liable, the Contractor shall and does hereby agree to compensate the Owner and the Architect and to indemnify them against all such costs, expenses, damages and liability.
 - e. 3.10.8 If the Owner considers it necessary for the Contractor or Subcontractor to cease Work at a designated point at any time for the orderly progress of the Work, each Contractor or Subcontractor, when directed by the Owner, shall transfer his men to such point or points as directed, and execute such portions of his Work as required to enable others to properly carry on their Work without delay.
 - f. 3.10.9 Additional provisions pertaining to the progress schedule are included in Division 1, General Requirements.
17. Add new Subparagraphs 3.13.2 and 3.13.3 as follows:
- a. 3.13.2 If the Owner requires the Contractor to relocate materials which have been stored on site or within the building, the Contractor shall relocate such materials at no additional cost to the Owner.
 - b. 3.13.3 The Contractor is responsible for its site access. The Contractor shall keep roads, walks, ramps, etc. on and adjacent to the Project site in good working order and condition and free from obstructions which might present a hazard to or interference with traffic. When construction operations necessitate the closing of traffic lanes, the Contractor shall be responsible for arranging such closings in advance with the authorities having jurisdiction, the Owner, and adjacent property Owners. The Contractor shall provide adequate barricades, signs and other devices for traffic guides and public safety.
18. Add new Subparagraphs 3.14.3, 3.14.4 and 3.14.5 as follows:
- a. 3.14.3 Cutting and patching shall be performed by the proper trades or crafts necessary for the material involved, but the cost of same shall be borne by the Contractor requiring the cutting and patching.
 - b. 3.14.4 Patching shall mean the restoration of a surface or item to its original condition to match the existing adjoining surfaces unless otherwise indicated, noted, detailed or specified.
 - 1. When patching involves painting, special coating, vinyl fabric or other applied finish, the entire surface affected (i.e., wall or ceiling) shall be refinished as a part of this requirement.
 - c. 3.14.5 Cutting and patching includes cleaning of all surfaces soiled by this work.
19. Add the following to Subparagraph 3.16:

3.16 - The Owner and Architect shall have access to the work at all times.

Article 7 - Changes in the Work

1. Modify Subparagraph 7.3.6 as follows:

In the last part of the second sentence, delete the words "a reasonable allowance for overhead and profit" and substitute "an allowance for overhead and profit in accordance with the schedule set forth in Subparagraph 7.3.6 as amended." This cost must include cost of supervision and project management, on or off site, Contractor's off site expense.

In the eighth line, change the word "Architect" to "Owner and Architect's".

2. Add a new Subparagraph 7.3.6.6 as follows:

7.3.6.6 In Subparagraph 7.3.3.3 and 7.3.3.4 the allowance for overhead and profit combined, included in the total cost to the Owner, shall be based on the following schedule:

- a. For the Contractor, the work performed by the Contractor's own forces, ten percent (10%) of the cost.
- b. For the Contractor, for work performed by his Subcontractor, ten percent (10%) of the amount due the Subcontractor.
- c. For each Subcontractor or Sub-Subcontractor involved, for work performed by his own forces, ten percent (10%) of the cost.
- d. For each Subcontractor, for work performed by his Sub-Subcontractors, ten percent (10%) of the amount due the Sub-Subcontractor.
- e. Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.1.4.
- f. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs showing quantities, with unit price of labor and materials for each quantity, including those items furnished by Subcontractors. Where major cost items are subcontracts, they shall be itemized also and a copy of their quotations, itemized as indicated above, shall be included in the proposal. In no case will a change involving over \$500.00 be approved without such itemization.
- g. "Cost" is to include supervision cost.

3. Add a new Subparagraph 7.3.6.7 as follows:

7.3.6.7 No action, conduct, omission, prior failure or course of dealing by the Owner shall act to waive, modify, change or alter the requirements that change orders must be in writing and signed by the Owner and Contractor, and that such written change orders are the exclusive method of effecting any change to the Contract Sum or Contract Time.

The Contractor acknowledges that the Contract Sum and Contract Time cannot be changed by implication, oral agreements, actions, inactions, course of conduct, or constructive change order.

Article 8 - Time

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1. Add a new Subparagraph 8.2.3.1 as follows:

8.2.3.1 Inasmuch as the completion of the Project within the prescribed time independent upon the close and active cooperation of all those engaged therein, it is, therefore, required that the Contractor shall lay out and install his Work at such time or times and in such manner as consistent with the schedule to permit the carrying forward of the work of other contractors.

2. Add a new Subparagraph 8.2.4 as follows:

8.2.4 - Except as otherwise provided herein, substantial completion of work shall be within the number of calendar days stated by the Contractor in Proposal Form (Form 96) and shall become a contract obligation. The time for completion of the Work shall be extended for the period of any excusable delay, which term shall include only those delays directly caused by any of the reasons enumerated in the following Sub-Paragraphs 8.3.2 and 8.3.3.

3. Add a new Subparagraph 8.2.5 as follows:

8.2.5 - Completion shall be understood to be substantial completion for the Owner's beneficial occupancy, with only minor "punch list" items yet to be completed and items such as balancing of heating system, etc., which cannot be completed due to climatic conditions.

4. Add a new Subparagraph 8.2.6 as follows:

8.2.6 Whenever it may be useful or necessary for the Owner to do so, before final inspection and acceptance of the Project, the Owner may take possession of the Project or parts thereof at any time that it is determined by the Architect that the construction has been completed to a point where the Owner can occupy or use said Project, or parts thereof, without impairment to Contractor's Work. The Owner may at such time install furnishings and equipment as he sees fit or may at his discretion award separate Contracts for this purpose. It is recognized that some of the Contractor's Work may not be complete at such time and the Contractor shall make all reasonable efforts to complete the Work as quickly as possible. Such use or occupation shall not relieve the Contractor of his guarantee of said Work and materials nor of his obligation to make good at his own expense any defective materials or workmanship which may occur or develop prior to Contractor's release from responsibility to the Owner.

However, the Contractor shall not be responsible for the maintenance of such portion of the Work as may be used or occupied by the Owner, nor for any damage thereto that is due to or caused by the negligence of the Owner during such period of use or occupancy.

5. Modify Subparagraphs 8.3.1 through 8.3.3 by deleting them in their entirety and replace them with the following:

- a. 8.3.1 If the Contractor is delayed at any time in the progress, performance or completion of any portion or portions of the whole of the Work contemplated by its Contract with Owner as the result of flood, cyclone, hurricane, tornado, earthquake or other similar catastrophe, or as the result of Acts of God, the public enemy, Acts of the Government, or fires, epidemics, quarantine restrictions, strikes or labor disputes, freight embargoes or unusual delay in transportation, unavoidable casualties, or on account of any acts or omissions of the Owner, Architect, or others engaged by them (except as herein provided), or by their employees, agents or representatives, or by changes ordered in the Work by the Owner which are not required to correct problems or discrepancies in the

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Contractor's Work, or by any other causes which the Contractor could not reasonably control or circumvent, and which are not due to any fault, neglect, act or omission on Contractor's part, and the risks of which are not otherwise assumed by Contractor pursuant to the provisions of the Contract Documents, then the Contract Time for completion of the portion or portions of the Work directly affected by such delay, shall upon timely request of the Contractor, be extended by a period equivalent to the time lost by reason of any and all of the aforesaid causes. Said period shall be as approved and certified by the Architect and the Owner.

- b. 8.3.2 No extension of time shall be granted for delays on account of, or resulting from, weather conditions or other natural phenomenon of normal intensity for the locality or other weather conditions except for the catastrophic weather conditions mentioned in the preceding Subparagraph 8.3.1, unsuitable ground conditions, inadequate construction forces, the failure of the Contractor to place orders for equipment or materials sufficiently in advance to insure their delivery when needed, or delays resulting from interruptions to or suspensions of Contractor's Work so as to enable other contractors to perform their Work.
- c. 8.3.3 Any claim for an extension in the Contract Time shall be based on written notice delivered to Owner and Architect within seventy-two (72) hours of the commencement of the event or occurrence giving rise to the claim. Such notice must set forth (a) the cause of the delay, (b) a description of the portion or portions of the Work affected thereby, and (c) all details pertinent thereto. Notice of the extent of the claim with supporting data, including application for the specific number of days extension of time requested shall be delivered to Owner and Architect within twenty (20) days of such occurrence unless Owner allows an additional period of time to ascertain more accurate data.
- d. 8.3.4 It is a condition precedent to the consideration or prosecution of claims relating to any delays, suspension, hindrance or causes which justify an extension of the Contract Time, that such claims be made and furnished in strict accordance with all applicable time limits provided in this Article. Otherwise, if the Contractor fails to comply, such claims shall be waived, invalid and unenforceable as against the Owner and Architect.
- e. 8.3.5 The Contractor agrees that, whether or not any delay shall be the basis for an extension of time, he shall have no claim against the Owner for an increase in the Contract Price, nor a claim against the Owner or Architect for a payment or allowance of any kind for damage, loss or expense resulting from delays nor shall Contractor have any claim for damage, loss or expense resulting from interruptions to, or suspension of his Work to enable other Contractors to perform their Work. As between the Contractor and Owner, except for delays caused by acts constituting intentional interference by the Owner with the Contractor's performance of its Work when such acts continue after the Contractor's written notice to the Owner of such interference, the Contractor shall assume the risk of all suspensions of, delays in or hindrances to the performance of the Work, regardless of the length thereof, arising from any and all causes whatsoever, including without limitation, those due to any acts or omissions of the Owner, other contractors or subcontractors, except only to the extent that an extension of time may be due to the Contractor as expressly provided for in this Article for such suspension, delay or hindrance. The Contractor shall bear all costs, expenses and liabilities which he may incur in connection with such suspensions, delays or hindrances, and all such suspensions, delays or hindrances, costs, expenses and liabilities of any nature, whatsoever, whether or

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not provided for in this Contract, shall conclusively be deemed to have been within the contemplation of the parties. The only remedy available to the Contractor shall be an extension of time.

1. 8.3.5.1 The Owner's exercise of any of its rights under the Contract Documents, including but not limited to, its rights regarding changes in the Work, regardless of the extent or number of such changes, performance of separate work or carrying out the Contractor's Work by the Owner directing overtime or changes in the sequence of the Work, withholding payment or otherwise exercising its rights under the provisions of Articles 9 and 14 hereof, or exercising any of its remedies of suspension of the Work or requirements of correction or re-execution of any defective work shall not, under any circumstances, be construed as intentional interference with the Contractor's performance of the Work.
- f. 8.3.6 In the event of a dispute between the Contractor and Owner concerning the period of such time extension, the matter shall be referred to the Architect whose decision thereon shall be final and binding upon the parties. Such extension or extensions of time as determined by the Owner or the Architect shall release and discharge the Owner and the Architect of and from any and all claims of whatever character by the Contractor on account of the aforesaid or any other causes of delay.
- g. 8.3.7 Notwithstanding any provision of this Contract, whether or not relating to the Contract Time, the Owner makes no representation or guarantee as to the date or time that the Project site or any portion thereof will be made available to the Contractor for the performance of the Work, or as to weather conditions at the Project site will be such as to permit the Work to be performed thereon without interruption or by any particular sequence or method or as to whether the performance of the Work can be completed by the time required under this Contract or by any other time.
- h. 8.3.8 Whenever in connection with this Contract it is required, expressly or otherwise, that the Owner shall perform any act relating to the Contract, including making available or furnishing any real property, materials, or other things, no guarantee is made by the Owner as to the time of such performance, and delay of the Owner in fulfilling such requirements shall not result in liability of any kind on the part of the Owner except only to the extent that an extension of time may be due as expressly provided for in this Article.

Article 9 - Payments and Completion

1. Add a new Subparagraph 9.2.2 as follows:

9.2.2 The Schedule of Values shall be prepared in a manner that shows each major portion of the Work as a separate line item. The Contractor shall identify those line items of Work that will be accomplished by Subcontractors.

2. Add a new Subparagraph 9.2.3 as follows:

9.2.3 Contractor shall obtain written concurrence in such schedule of values from the Surety furnishing any Performance Bond and Labor and Materials Payment Bond. Copy of written

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concurrence by the Surety shall be submitted by the time of written submission.

3. Add a new Subparagraph 9.2.4 as follows:

9.2.4 Said schedule shall include a value of two (2) percent closeout cost associated with each subcontractor and is to be clearly itemized on the schedule.

4. Modify Subparagraph 9.3.1 by adding the following:

Two percent closeout cost associated with each subcontractor and is the end thereof:

- a. 9.3.1 Progress payment requests shall be to be clearly itemized on the schedule, submitted on a notarized AIA Document G702, Application and Certificate for Payment, supported by AIA G703, Continuation Sheet. These requests shall detail the value of the various materials stored on the site and the value of the various types of labor performed during the period of time since the previous payment request. The Contractor shall attach to each payment request, a statement certifying that all payments due the Contractor from previously issued Certificates for Payment have been paid. Contractor shall furnish such additional supporting data substantiating the Contractor's right to payment as the Owner or Architect may require. All payments shall be made in accordance with Indiana's Prompt Payment Statute, I.C. 5-17-5 et seq. following submission to the Owner.

Payment will be recommended by Architect, and approved by the Owner, based on ninety percent (90%) of the estimated value of labor performed and materials incorporated in the Work, plus ninety percent (90%) of the value of non-perishable materials suitably stored at the site. Stored materials shall not be removed from the site without permission of the Owner.

b. Add the following Subparagraphs 9.3.1.3 through 9.3.1.6 as follows:

1. 9.3.1.3 - Until the Work is 50 percent complete, the Owner shall pay 90 percent of the amount due the Contractor on account of progress payments. At the time Work is 50 percent complete and thereafter, the Architect will authorize remaining partial payments to be paid in full.
2. 9.3.1.4 - Until his Subcontract is fifty percent (50%) complete, a Subcontractor shall be paid ninety percent (90%) of the earned sum by the Contractor. At the time his Subcontract is fifty percent (50%) complete, if the manner of completion of his Subcontract and its progress are and remain satisfactory to the Contractor and the Architect/Engineer, and in the absence of other good and sufficient reasons, he shall be paid in full on the remaining progress payments.
3. 9.3.1.5 - The full contract retainage may be reinstated if the manner of completion of the work and its progress do not remain satisfactory to the Architect/Engineer, or the Owner, or for other good and sufficient reasons.
4. 9.3.1.6 - The Owner, Contractor, and the Architect/Engineer shall cooperate to the end that retentions shall be paid promptly when all conditions of the contract have been met.

5. Add the following Subparagraphs 9.3.2.1 to 9.3.2 as follows:

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9.3.2.1 - Payment for Stored Material and Equipment will be made if the Contractor includes with each monthly request the following two paragraphs to certify that all material and equipment for which payment is requested is in fact paid for the Contractor and becomes the property of the Owner. The Architect reserves the right to observe building materials, stored off-site, for which the Contractors are requesting payment. If building materials are stored more than five miles from the project site or the Architect's office, the Prime Contractor requesting payment shall compensate the Architect both for time and expense in making this review.

- a. "The Contractor certifies that all stored materials included in this Application for Payment are free and clear of all liens, claims, security interests and encumbrances and that no work, materials, or equipment covered hereby is subject to any retained interest by any other person."
- b. "Title to all work materials and equipment covered by this Application for Payment which has not hereto before passed to the Owner is hereby conveyed and transferred to the Owner effective upon payment of this Application for Payment."

6. Add the following to Subparagraph 9.4.3:

"ESCROW ACCOUNT FOR RETAINAGE, applicable to contracts in amounts of \$100,000 or more, in accordance with Indiana Statutes."

7. Add new Subparagraph 9.5.4 as follows:

9.5.4 In the event Owner withholds any payment, partial or final, from the Contractor by virtue of Contractor's failure to make payments properly to subcontractors, laborers, and material suppliers for labor, materials, and/or equipment furnished to the Project, Owner may, but shall not be obligated or required to, make direct payment on behalf of Contractor of any part or all of such sums due and owing to said subcontractors, material suppliers and/or laborers for their labor, materials or equipment furnished to the Project, not to exceed the Contract Sum remaining due and owing to Contractor, and charging all such direct payments against the Contract Sum under the Contract. Before making any such direct payments for labor, materials or equipment, Owner first shall give Contractor three (3) days' written notice stating Owner's intention to make such payment and setting forth the names of the subcontractors, material suppliers and/or laborers which Owner intends to pay directly, the amounts to be paid them, and the reason therefor. If Contractor does not pay or otherwise satisfy such bills, statements and/or claims of the parties so identified within two (2) days after receipt of such notice or give Owner satisfactory assurances that the same will be paid or otherwise satisfied, Owner may proceed with such payment; provided, however, nothing contained in this paragraph shall create any personal liability on the part of the Owner to any subcontractor, material supplier or laborer, or any direct contractual relationship between Owner and them.

8. Add new Subparagraph 9.5.5 as follows:

9.5.5 If any claim or lien is made or filed with or against the Owner, the Project, real estate, or contract proceeds by any person claiming that Contractor or any subcontractor or other person for whom Contractor is liable has failed to make payment for labor, services, materials, equipment, taxes or other items or obligations furnished or incurred for or in connection with the Work, or if any time there shall be evidence of such non-payment or of any claim or lien which is chargeable to Contractor, or if Contractor or any subcontractor or other person for whom Contractor is liable causes damage to the Work or to any other Work on the Project, or if

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Contractor fails to perform or is otherwise in default under any of the terms or provisions of the Contract Documents, Owner shall have the right to retain from any payment then due or thereafter to become due an amount which it deems sufficient to (1) satisfy, discharge and/or defend against such claim or lien or any action which may be brought or judgment which may be recovered thereon, (2) make good any such non-payment, damage, failure or default, and (3) compensate the Owner and Architect for and indemnify them against any and all losses, liability, damages, costs, expenses including legal fees and disbursements which may be sustained or incurred by either or both of them in connection therewith. Owner shall have the right to apply and charge against Contractor so much of the amount retained as may be required for the foregoing purposes. If the amount retained is insufficient therefor, Contractor shall be liable for the difference and shall pay the same to the Owner.

9. 9.6 - "Progress Payments". Add the following to 9.6.1 and Subparagraphs 9.6.8 through 9.6.13 to 9.6:
 - a. 9.6.1 - The Schedule of Values so prepared by the Contractor, reviewed by the Architect/Engineer, and concurred by the Surety, shall constitute the basis of progress payments to the Contractor, and payments made pursuant to regards the Architect, the Contractor and the Surety on any bonds be deemed properly made at the request of the Contractor and the Surety.
 - b. 9.6.8 - Upon commencement of the Work, an escrow account shall be established in a financial institution chosen by the Contractor and approved by the Owner.
 - c. 9.6.9 - The escrow agreement shall provide that the financial institution will act as escrow agent, will pay interest on funds deposited in such account in accordance with the provisions of the escrow agreement and will disburse funds from the account upon the direction of the Owner as set forth below. Compensation to the escrow agent for establishing and maintaining the escrow account shall be paid from interest accrued in the escrow account.
 - d. 9.6.10 - As each progress payment is made, the retainage with respect to that payment shall be deposited by the Owner in the escrow account.
 - e. 9.6.11 - Interest earned on retainage will be maintained proportionally to the amount of retainage which is maintained, and any retainage which is released to the contractor will also be released with the appropriate amount of interest earned at the time that the retainage is released to the Contractor.
 - f. 9.6.12 - When the Contractor has fulfilled all of the requirements of the Contract providing for reduction of retained funds, the escrow agent shall release to the Contractor one-half of the accrued funds but none of the interest thereon. When the work has been fully completed in a satisfactory manner and the Architect has issued a final Certificate for Payment, the escrow agent shall pay to the Contractor the full amount of funds remaining in the account, including net balance of the interest paid to the account, but less any interest that may have accrued for the benefit of the Owner, which shall be paid for the Owner.
 - g. 9.6.13 - If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor, the escrow agent shall make payment to the Contractor as provided in Subparagraph 9.10.3

10. Add new Subparagraph 9.10.6 as follows:

9.10.6 - Final Payment, including all escrowed principal and escrowed income shall be due within sixty-one (61) days following the Date of Substantial Completion, as defined above. If at that time there are any remaining uncompleted minor items, an amount equal to two hundred

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percent (200%) of the value of each item as determined by the Architect/Engineer shall be withheld until all such items are complete. The cost of the review estimate and other efforts necessary to establish the value of the incomplete work will be deducted from the remaining funds owed to the Contractor.

11. Add Paragraph 9.11 and Subparagraph 9.11.1 as follows:
 - a. 9.11 - Owner cost incurred due to incomplete work.
 - b. 9.11.1 - The Contractor and the Contractor's surety, if any, shall be liable for and shall pay the Owner all sums incurred and attributable to the work not being completed within the number of days stated on the bid form including extensions of time properly granted and within 60 days after Substantial Completion.

Article 10 - Protection of Persons and Property

1. Modify Subparagraph 10.2.2 by adding the following sentence to the end thereof:

10.2.2 The Contract Sum includes the cost of such notices and compliance, and Owner may deduct from the Contractor's account any expense the Owner incurs because of the Contractor's failure to comply with such laws, ordinances, rules, regulations and lawful orders.

2. Add a new Subparagraph 10.2.4.1 as follows:

10.2.4.1 - When use or storage of explosives and other hazardous materials or equipment or unusual methods are necessary, the Contractor shall give the Owner reasonable advance notice.

3. Add a new Subparagraph 10.2.8 as follows:

10.2.8 The Contractor shall comply with all applicable safety recommendations of the Associated General Contractors of America, American National Standards Institute and National Fire Protection Association, the Occupational Safety and Health Act, and all special safety and security requirements of the Owner. If any inconsistency exists between the provisions of this Subparagraph 10.2.8 and Subparagraph 10.2.2, Subparagraph 10.2.2 shall take precedence.

4. Add a new Subparagraph 10.2.9 as follows:

10.2.9 All damage, injury or loss to any property referred to in Paragraph 10.2 caused, directly or indirectly, in whole or in part, by Contractor, any subcontractor or anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, shall be remedied by Contractor. Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as all the Work is completed and accepted by Owner.

5. Add a new Subparagraph 10.2.10 as follows:

10.2.10 Contractor shall indemnify, save harmless and defend Owner from any liability, including any and all claims, damages, losses, costs, attorneys' fees and other professional fees, resulting from any violation of all such applicable laws, ordinances, rules, regulations, lawful orders and safety requirements referred to in Paragraph 10.2.

Article 11 - Insurance

1. Delete Subparagraph 11.1.2 in its entirety and substitute the following:

11.1.2 The Contractor shall not commence the Work until he has obtained all insurance required under this section and has submitted a Certificate of Insurance form to the Owner. Certificates shall be furnished on AIA Document G705 or the Accord Form and submitted to the Architect, in duplicate, at least five (5) days prior to starting Work. The Certificate shall provide for sixty (6) days prior written notice to the Owner and Architect of policy cancellation or of material change. If requested, a certified copy of the policies shall be submitted to the Architect for his review. The Owner, the Owner's Representative and the Architect shall be named as additional insureds for those insurance coverages carried and maintained by the Contractor except as respects workers' compensation. The Contractor shall maintain the above insurance at all times until completion of the Work or later, as provided in the Contract Documents.

2. Add a new Subparagraph 11.1.2.1 as follows:

11.1.2.1 In the event the Contractor engages Subcontractors for all of a portion of the Work required by its Contract, the Contractor will require any and all Subcontractors to also assume all of the duties, obligations and requirements in this Article. The Contractor shall require such Subcontractors to provide Certificates of Insurance evidencing the insurance, and naming the Contractor, Architect, and Owner as additional insureds, except as respects worker's compensation insurance, and that the insurance carried and maintained by the Subcontractor meets all of the requirements of this Article. The Contractor shall not permit any Subcontractor to commence Work until a Certificate of such insurance has been submitted and on file with the Contractor.

3. Add a new Subparagraph 11.1.2.2 as follows:

11.1.2.2 The Contractor's Commercial General Liability Insurance shall include premises - operations (including explosion, collapse and underground coverage) elevators, independent contractors, products liability, completed operations, and blanket contractual liability on all written contracts, all including broad form property damage coverage.

4. Add a new Subparagraph 11.1.2.3 as follows:

11.1.2.3 The Contractor's Commercial, General and Automobile Liability Insurance, as required by Subparagraphs 11.1.1, 11.1.2, 11.1.2.1 and 11.1.2.2 shall be written for not less than limits of liability as follows, or as required by law, whichever is greater, and shall name the Owner and Project Manager as additional insureds:

- a. Worker's Compensation Statutory

	Employer's Liability	\$1,000,000 Each Accident
b.	Commercial General Liability	Bodily Injury & Property Damage
	Commercial Form Including: Premises-Operations	\$2,000,000 Each Occurrence
	Explosion & Collapse -Hazard	\$2,000,000 General Aggregate
	-Underground Hazard -Products/Completed Operational Hazard Contractual Insurance	\$2,000,000 Product/ Completed Operation Aggregate
	-Broad Form Property Damage	
	-Independent Contractors	
	-Personal Injury (with Contractual and Employee Exclusions Deleted)	\$2,000,000 Personal Injury
c.	Comprehensive Automobile Liability (Including Owned, Non-Owned, and Hired Vehicles)	
	Bodily Injury and Property Damage Combined Single Limit \$2,000,000	

5. Add a new Subparagraph 11.1.2.4 as follows:

11.1.2.4 For all worker's compensation and employer's liability insurance required hereby, Contractor shall require wavier of subrogation for itself and for all subcontractors, or others performing Work on the Project pursuant to the terms of Contractor's Contract with Owner.

6. Add a new Subparagraph 11.1.2.5 as follows:

11.1.2.5 Commercial General Liability Insurance may be arranged under a single policy for the full limits required or by a combination of underlying policies with the balance provided by an Excess or Umbrella Liability Policy in the amount of \$5,000,000.

7. Delete Subparagraph 11.4.1 and substitute the following:

11.4.1 - The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum.

- a. 11.4.1.1 - The Contractor shall deliver the required bonds to the Owner not later than three (3) days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.
- b. 11.4.1.2 - The Contractor 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.

8. Add a new Subparagraph 11.4.3 as follows:

11.4.3 - Each Contractor to whom awards are made, shall furnish a Performance Bond and Labor and Material Payment Bond with submission of his Contract to the Owner. The Contractor shall use a Surety for this Performance Bond and Labor and Material Payment Bond one of the acceptable companies listed in "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies": Circular 570, latest Revision, Department of the Treasury. The Contractor shall use a surety company that can underwrite the entire amount of the Performance Bond and Labor and Material Payment Bond. Underwriting limitations for the acceptable companies are also contained in Circular 570. Said Performance Bond and Labor and Material Payment Bond shall be in amount not less than the following percentage of the Contract Sum:

One hundred percent (100%)

Performance Bond and Labor Material Payment Bond shall be security for the following:

The faithful performance of all provisions of the Contract and satisfactory completion of the work included thereunder.

The payment of all persons performing labor and furnishing materials in connection with the Contract.

The covering of all guarantees included herein.

The addition to the paragraphs above, this Bond shall guarantee the Owner for a period of one (1) year after the date of acceptance of the work by the Owner that all workmanship and materials performed and furnished as part of this Contract are in accordance with the Drawings and Specifications and that the Contractor shall remove any defects due to faulty workmanship and/or materials that shall appear within the guarantee period.

Article 12 - Uncovering and Correction of Work

1. Add a new Subparagraph 12.2.6 as follows:

12.2.6 Contractor shall return to project up to 24 months from date of substantial completion to repair all masonry cracks inside or out, and establish new control joints as required.

Article 13 - Miscellaneous Provisions

1. Modify Subparagraph 13.2.1 by adding the following to the end thereof:

13.2.1 Neither this Contract nor any monies due or to become due hereunder shall be assignable without the prior written consent of the Owner, neither shall the whole or any part of this Contract be sublet without such prior written consent. Any such assignment or subletting without prior written consent by the Owner shall be void and of no effect and shall vest no right of action in the assignee or subcontractor as against the Owner or Architect. Owner's consent to any subletting shall not be deemed to create any contractual relationship between the Owner and any subcontractor to whom the work or any portion thereof is sublet and shall not vest any right or right of action in such subcontractor against Owner.

2. Add a new Subparagraph 13.4.3 as follows:

13.4.3 Every provision of the Contract is intended to be severable such that, if any term or provision thereof is illegal or invalid for any reason whatsoever, such provision shall be severed from the Contract and shall not affect the validity of the remainder of the Contract. A waiver of any breach or default under the Contract shall not constitute a waiver of any other breach or default of any provision hereunder.

3. Add a new Subparagraphs 13.5.7, 13.5.8, 13.5.9, 13.5.10 and 13.5.11 as follows:

- a. 13.5.7 Where materials are specified to conform to the standard specifications of the American Society for Testing and Materials, American Concrete Institute, American Institute of Steel Construction, other recognized technical organizations with the Federal Government, but testing is not required in connection therewith, the Contractor shall furnish certificates to the Architect and Owner's Representative as evidence that the proposed products meet requirements of standard specifications cited.
- b. 13.5.8 Notices required by this Paragraph shall be delivered in writing to the Architect no less than three (3) days prior to inspection, test or approval date. Notices shall specify the location and time that inspection, test or approval will be made.
- c. 13.5.9 If any portion of the Work to be inspected, tested or approved under the observation of the Architect or Owner is not ready for such inspections, tests or approvals at the time designed in the Contractor's notice to the Architect, the Contractor shall bear all costs for Architect's additional services made necessary by such delay.
- d. 13.5.10 Certificates of inspection or testing shall indicate if that portion of the Work inspected or tested meets the minimum requirements of the standard or regulation specified. Certificates shall include the name of Contractor, name of

- Project and location and date inspection or test was conducted.
- e. 13.5.11 Additional provisions pertaining to testing are included in Division 1 - General Requirements, and in Sections relating to specific work involved.

5. Add a new Subparagraph 13.8.1 as follows:

13.8.1 The Contractor shall comply with all federal, state, and municipal and local rules, ordinances, rules, regulations, orders, notices and requirements relating to non-discrimination in employment, fair employment practices, and equal employment opportunity, whether or not provided elsewhere in the Contract Documents without additional charge or expense to the Owner, and shall be responsible for and correct, at its own cost and expense, any violations thereof resulting from or in connection with the performance of the Work. Contractor shall at any time upon demand, furnish such proof as the Owner may require to demonstrate compliance with such requirements and correction of any violations. Contractor agrees to save harmless and indemnify the Owner, the Owner's Representative, and Architect from and against any and all loss, injury, claims, actions, damages, costs and expenses, including legal fees and disbursements, caused or occasioned directly or indirectly by the Contractor's failure to comply with any of said laws, ordinances, rules, regulations, orders, notices or requirements, or to correct violations.

6. Add a new Subparagraph 13.8.2 as follows:

13.8.2 Contractor shall maintain policies of employment as follows:

1. Pursuant to the requirements of Indiana Code S22-91-10 and S5.16-6-1, Contractor and his Subcontractors may not discriminate against any employee or applicant for employment to be employed in the performance of such contract, with respect to his hire, tenure, terms, conditions or privileges of employment of any matter directly or indirectly related to employment because of his race, religion, color, sex, handicap, national origin or ancestry. The Contractor and Subcontractor, if any, agrees to comply with all the provisions contained in the Equal Opportunity Clause quoted in Executive Orders No. 11246 and No. 11375. In addition, the Contractor shall cause this Equal Opportunity Clause to be included in the subcontracts or purchase orders hereunder unless exempted by rules, regulations and orders of the Secretary of Labor issued pursuant to Section 204 of the executive Orders No. 11246 and No. 11375 as amended. Breach of this covenant may be regarded as a material breach of contract.
2. Contractor and Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them on their behalf, state all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, handicap, national origin or ancestry.

7. Add a new Subparagraph 13.9.1 as follows:

13.9.1 The Contractor affirms under the penalties of perjury that it does knowingly employ an unauthorized alien. The Contractor shall enroll in and verify the work eligibility status of all its newly hire employees through the E-Verify program as defined in IC 22-5-1.7-3. The

Contractor shall not knowingly employ or contract with an unauthorized alien. The Contractor shall not retain and employee or contract with a person the Contractor subsequently learns is an unauthorized alien. The Contractor shall require its Subcontractors, who perform work under this Agreement, to certify to the Contractor that the Subcontractor has enrolled and is participating in the E-Verify program. The Contractor agrees to maintain this certification throughout the duration the term of an agreement with a Subcontractor. In addition to the Owner's right to terminate under other provision of this Agreement, the Owner may terminate for default if the Contractor fails to cure a breach of this provision.

8. Add a new Subparagraph 13.10.1 as follows:

13.10.1. As required by IC 5-22-16.5, the Contractor certifies that it is not engaged in investment activities in Iran or agency or instrumentality of the government of Iran, as defined and regulated by Senate Enrolled Act 231, effective July 1, 2012. Providing false certification may result in the consequences listed in IC 5-22-16.5-14, including termination of the Agreement and denial of future agreements, as well as an imposition of civil penalty.

Article 14 - Termination of the Contract

1. Add a new Subparagraph 14.2.5 as follows:

14.2.5 The Contract may be terminated by the Owner in whole or in part without cause and for its convenience on three (3) days written notice to the Contractor. In the event of such termination for convenience, the Contractor shall be compensated for that portion of the contract sum earned to the date of termination, but Owner shall not be liable for any additional or other consequential damages. Such entitlement of Contractor shall constitute Contractor's sole and exclusive remedy and recovery, and in no event shall the Contractor be entitled to recover anticipated profits and overhead on unperformed Work by reason of such termination for convenience.

2. Add a new Subparagraph 14.2.6 as follows:

14.2.6 Owner shall have the right to terminate the Contract at any time upon three (3) days' written notice to contractor in the event Owner is unable to obtain or maintain financing for the portion of the Work as yet unfinanced or uncompleted. Owner shall be obligated to pay Contractor that portion of the Contract Sum earned to the date of termination, but Owner shall not be liable for any additional or other consequential damages.

3. Add a new Subparagraph 14.2.7 as follows:

14.2.7 The occurrence of any labor dispute, work stoppage, strike (including sympathetic strike), slow down, picketing, or any other activity directly or indirectly attributable to Contractor's employees, either caused by them or resulting from their employment on the Project which interrupts, interferes with or delays the Work of Contractor or other separate contractors shall constitute a breach of Contract. In such event, the Owner shall have the right, in addition to any other rights and remedies provided by this Contract or the Contract Documents, or by law, following two (2) days' written notice to the Contractor, to terminate this Contract or any part thereof for all or any portion of the Work, and for purpose of completing the Work, to enter

upon the premises and take possession in the same manner, to the same extent, and upon the same terms and conditions as set forth in Subparagraph 14.2.3.

4. Add a new Subparagraph 14.2.8 as follows:

14.2.8 If termination of the Contract is effectuated by Owner for cause resulting from Contractor's failing to substantially perform in accordance with the terms of the Contract, and it is subsequently found or determined in legal proceedings that the Contractor was not in substantial breach of the Contract by failure to perform in accordance with its terms, or that such failure was caused through fault of the Owner, then such termination shall be deemed to be a termination for convenience pursuant to Subparagraph 14.2.1, and the Contractor's remedy and recovery as against the Owner shall, in such case, be limited to the payments provided by such Subparagraph 14.2.1

END OF DOCUMENT

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Contract description.
- B. Work sequence.
- C. Specification Conventions.

1.2 CONTRACT DESCRIPTION

- A. The project includes a new recycling center building. The Work includes earthwork, sewers, paving, concrete, masonry, structural steel, carpentry, insulation, sealant, doors, frames, hardware, windows, finishes, accessories, plumbing, HVAC and electrical.

1.3 SPECIFICATION CONVENTIONS

- A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Contingency allowances.
- B. Alternates.
- C. Schedule of values.
- D. Applications for payment.
- E. Change procedures.

1.2 CONTINGENCY ALLOWANCES

- A. Include in the Base Bid, a stipulated sum/price of \$50,000.00 for changes to the work as directed by the Architect/Engineer.
- B. Contractor overhead and profit on the contingency allowance shall be included in the Base Bid.
- C. Funds will be drawn from Contingency Allowance only by Change Allowance Bulletin issued by the Architect.
- D. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order.

1.3 ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work.
- C. Schedule of Alternates:
 - 1. Alternate No. 1: State the amount to be added to the Base Bid for providing the radiant floor heating system as shown on the drawings. Base Bid shall be no radiant floor heating system.
 - 2. Alternate No. 2: State the amount to be added to the Base Bid for providing the mezzanine as shown on the drawings including stair, railing system and mezzanine framing. Base Bid shall be no mezzanine.

1.4 SCHEDULE OF VALUES

- A. Submit printed schedule on AIA Form G703 - Continuation Sheet for G702.
- B. Submit Schedule of Values in duplicate within 15 days after date of Notice to Proceed.
- C. Format: Utilize Table of Contents of this Project Manual. Identify each line item with number and title of major specification Section. Separate material and labor costs. Identify site mobilization, bonds and insurance.
- D. Include in each line item, amount of Allowances specified in this section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by unit cost to achieve total for each item.
- E. Include within each line item, direct proportional amount of Contractor's overhead and profit.
- F. Revise schedule to list approved Change Orders, with each Application For Payment.

1.5 APPLICATIONS FOR PAYMENT

- A. Submit five copies of each application on AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet for G702.
- B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
- C. Submit updated construction schedule with each Application for Payment.
- D. Payment Period: Submit at intervals stipulated in the Agreement.
- E. Submit with transmittal letter.
- F. Submit waivers required by the Owner.
- G. Substantiating Data: When Architect/Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
 - 1. Current construction photographs.
 - 2. Partial release of liens from major subcontractors and vendors.
 - 3. Affidavits attesting to off-site stored products and insurance.
 - 4. Construction progress schedules, revised and current.

1.6 CHANGE PROCEDURES

- A. Submittals: Submit name of individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

- B. The Architect/Engineer will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on AIA Form G710.
- C. The Architect/Engineer may issue a Proposal Request including a detailed description of proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with stipulation of overtime work required and the period of time during which the requested price will be considered valid. Contractor will prepare and submit estimate within 7 days.
- D. Contractor may propose changes by submitting a request for change to Architect/Engineer, describing proposed change and its full effect on the Work. Include a statement describing reason for the change, and effect on Contract Sum/Price and Contract Time with full documentation and a statement describing effect on Work by separate or other Contractors. Document requested substitutions.
- E. Stipulated Sum/Price Change Order: Based on Proposal Request and Contractor's fixed price quotation or Contractor's request for Change Order as approved by Architect/Engineer.
- F. Construction Change Directive: Architect/Engineer may issue directive, on AIA Form G713 Construction Change Directive signed by Owner, instructing Contractor to proceed with change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in Contract Sum/Price or Contract Time. Promptly execute change.
- G. Time and Material Change Order: Submit itemized account and supporting data after completion of change, within time limits indicated in Conditions of the Contract. Architect/Engineer will determine change allowable in Contract Sum/Price and Contract Time as provided in Contract Documents.
- H. Maintain detailed records of work done on Time and Material basis. Provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- I. Document each quotation for change in cost or time with sufficient data to allow evaluation of quotation.
- J. Change Order Forms: AIA G701.
- K. Execution of Change Orders: Architect/Engineer will issue Change Orders for signatures of parties as provided in Conditions of the Contract.
- L. Correlation Of Contractor Submittals:
 - 1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.

2. Promptly revise progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
3. Promptly enter changes in Project Record Documents.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Coordination and project conditions.
- B. Preconstruction meeting.
- C. Progress meetings.
- D. Pre-installation meetings.
- E. Cutting and patching.
- F. Special procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of various sections of Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.
- C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown 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.
- D. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's occupancy.
- F. 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.

1.3 PRECONSTRUCTION MEETING

- A. Architect/Engineer will schedule meeting after Notice of Award.
- B. Attendance Required: Owner, Architect/Engineer, and Contractor and Subcontractors.
- C. Agenda:
 - 1. Execution of Owner-Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of schedule of values and progress schedule.
 - 5. Designation of personnel representing Owner, Architect/Engineer and Contractor.
 - 6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 - 7. Use of premises by Owner and Contractor.
 - 8. Owner's requirements.
 - 9. Construction facilities and controls.
 - 10. Temporary utilities.
 - 11. Security and housekeeping procedures.
 - 12. Schedules.
 - 13. Application for payment procedures.
 - 14. Procedures for testing.
 - 15. Procedures for maintaining record documents.
- D. The Architect/Engineer will record minutes and distribute copies to participants and those affected by decisions made.

1.4 PROGRESS MEETINGS

- A. The Architect will Schedule and administer meetings throughout progress of the Work at maximum bi-monthly intervals.
- B. Architect/Engineer will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Contractor's Project Manager, Job superintendent, and Architect/Engineer's representative.
- D. Agenda:
 - 1. Progress to date.
 - 2. Anticipated progress next 30 days.
 - 3. Identification of problems impeding planned progress.
 - 4. Review of submittals schedule and status of submittals.
 - 5. Maintenance of progress schedule.
 - 6. Corrective measures to regain projected schedules.
 - 7. Review of Requests For Information (RFI's).
 - 8. Review of Architect's Supplemental Instructions (ASI's).

9. Review of Proposal Requests (PR's).
 10. Review of Change Orders (CO's).
 11. Review of Pay Applications.
 12. Review of submittals schedule and status of submittals.
 13. Owner discussions, concerns and comments.
 14. Architect discussions, concerns and comments.
 15. Other business relating to Work.
- E. The Architect will record minutes and distribute copies to participants and those affected by decisions made.

1.5 PRE-INSTALLATION MEETINGS

- A. When required in individual specification sections, convene pre-installation meetings at Project site prior to commencing work of specific section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific section.
- C. Notify Architect/Engineer four days in advance of meeting date.
- D. Prepare agenda and preside at meeting:
 1. Review conditions of installation, preparation and installation procedures.
 2. Review coordination with related work.
- E. Record minutes and distribute copies within two days after meeting to participants, with copies to the Architect/Engineer, and the Owner, and those affected by decisions made.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

- A. Employ skilled and experienced installer to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
 1. Structural integrity of element.
 2. Integrity of weather-exposed or moisture-resistant elements.
 3. Efficiency, maintenance, or safety of element.
 4. Visual qualities of sight exposed elements.
 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill, to complete Work, and to:

1. Fit the several parts together, to integrate with other Work.
 2. Uncover Work to install or correct ill-timed Work.
 3. Remove and replace defective and non-conforming Work.
 4. Remove samples of installed Work for testing.
 5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.
- D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products in accordance with requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.
- I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07840, to full thickness of penetrated element.
- J. Refinish surfaces to match adjacent finishes. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
- K. Identify hazardous substances or conditions exposed during the Work to Architect/Engineer for decision or remedy.

3.2 SPECIAL PROCEDURES

- A. Materials: As specified in product sections; match existing with new products and salvaged products for patching and extending work.
- B. Employ skilled and experienced installer to perform alteration work.
- C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.
- D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.
- E. Remove debris and abandoned items from area and from concealed spaces.
- F. Prepare surface and remove surface finishes to permit installation of new work and finishes.

- G. Close openings in exterior surfaces to protect existing work from weather and extremes of temperature and humidity.
- H. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original condition.
- I. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with neat transition to adjacent finishes.
- J. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
- K. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect/Engineer for review.
- L. Where change of plane of $\frac{1}{4}$ inch (6 mm) or more occurs, submit recommendation for providing smooth transition; to Architect/Engineer for review.
- M. Trim existing doors to clear new floor finish. Refinish trim to original condition.
- N. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.
- O. Finish surfaces as specified in individual product sections.

END OF SECTION

SECTION 01 32 16

NETWORK ANALYSIS SCHEDULES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. References.
- B. Quality assurance.
- C. Format.
- D. Schedules.
- E. Submittals.
- F. Review and evaluation.
- G. Updating schedules.
- H. Distribution.

1.2 REFERENCES

- A. The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry, Washington, D.C., The Associated General Contractors of America (AGC).

1.3 QUALITY ASSURANCE

- A. Scheduler: Contractor's personnel specializing in CPM scheduling with five years minimum experience in scheduling construction work of complexity comparable to this Project, and having use of computer facilities capable of delivering detailed graphic printout within 48 hours of request.
- B. Contractor's Administrative Personnel: Five years minimum experience in using and monitoring CPM schedules on comparable projects.

1.4 FORMAT

- A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable specification section number.
- B. Scale and Spacing: To allow for notations and revisions.

1.5 SCHEDULES

- A. Prepare network analysis diagrams and supporting mathematical analyses using Critical Path Method, under concepts and methods outlined in AGC's "The Use of CPM in Construction - A Manual for General Contractors and the Construction Industry".
- B. Illustrate order and interdependence of activities and sequence of work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.
- C. Illustrate complete sequence of construction by activity, identifying work of separate stages, floors, etc. Indicate dates for submittals and return of submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.
- D. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
 - 1. Preceding and following event numbers.
 - 2. Activity description.
 - 3. Estimated duration of activity, in maximum 15 day intervals.
 - 4. Earliest start date.
 - 5. Earliest finish date.
 - 6. Actual start date.
 - 7. Actual finish date.
 - 8. Latest start date.
 - 9. Latest finish date.
 - 10. Total and free float; accrue float time to Owner and to Owner's benefit.
 - 11. Monetary value of activity, keyed to Schedule of Values.
 - 12. Percentage of activity completed.
 - 13. Responsibility.
- E. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, of accepting revised completion dates, and recomputation of scheduled dates and float.
- F. Required Sorts: List activities in sorts or groups:
 - 1. By preceding work item or event number from lowest to highest.
 - 2. By longest float, then in order of early start.
 - 3. By responsibility in order of earliest possible start date.
 - 4. In order of latest allowable start dates.
 - 5. In order of latest allowable finish dates.
 - 6. Contractor's periodic payment request sorted by Schedule of Values listings.
 - 7. Listing of basic input data generating report.
 - 8. Listing of activities on critical path.
- G. Prepare sub-schedules for each stage of Work.
- H. Coordinate contents with schedule of values.

1.6 SUBMITTALS

- A. Within 10 days after date established in Notice to Proceed, submit proposed preliminary network diagram defining planned operations for first 60 days of Work, with general outline for remainder of Work.
- B. Participate in review of preliminary and complete network diagrams jointly with Architect/Engineer.
- C. Within 20 days after joint review of proposed preliminary network diagram, submit draft of proposed complete network diagram for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete network analysis consisting of network diagrams and mathematical analysis.
- E. Submit updated network schedules for each Progress Meeting.

1.7 REVIEW AND EVALUATION

- A. Participate in joint review and evaluation of network diagrams and analysis with Architect/Engineer at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise network diagrams and analysis incorporating results of review, and resubmit within 14 days.

1.8 UPDATING SCHEDULES

- 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. Update diagrams to graphically depict current status of Work.
- C. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.
- D. Indicate changes required to maintain Date of Substantial Completion.
- E. Submit sorts required to support recommended changes.
- F. Prepare narrative report to define problem areas, anticipated delays, and impact on schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate contractors.

1.9 DISTRIBUTION

- A. Following joint review, distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect/Engineer, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Product data.
- C. Shop drawings.
- D. Samples.
- E. Test reports.
- F. Certificates.
- G. Manufacturer's instructions.
- H. Manufacturer's field reports.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Architect/Engineer accepted form.
- B. Sequentially number transmittal forms. Mark revised submittals with original number and sequential alphabetic suffix.
- C. Identify Project, Contractor, subcontractor and supplier; pertinent drawing and detail number, and specification section number, appropriate to submittal.
- D. 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 requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite Project, and deliver to LANCER ASSOCIATES at 145 North East Street, Indianapolis, IN 46204. Coordinate submission of related items.
- F. For each submittal for review, allow 15 days excluding delivery time to and from Contractor.
- G. Identify variations from Contract Documents and product or system limitations which may be detrimental to successful performance of completed Work.

- H. Allow space on submittals for Contractor and Architect/Engineer review stamps.
- I. When revised for resubmission, identify changes made since previous submission.
- J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- K. Submittals not requested will not be recognized or processed.
- L. Electronic File Drawings may be requested for submittals, the cost for each sheet is \$100.00 if requested in the Architect's current software edition. There will be an additional cost of \$25.00 per sheet for any other editions. In addition to this, a signed release of "Waiver of claims for use of electronic data" for each request for electronic files.

1.3 PRODUCT DATA

- A. Product Data: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
- C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- D. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents.

1.4 SHOP DRAWINGS

- A. Shop Drawings: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- C. After review, produce copies and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents.

1.5 SAMPLES

- A. Samples: Submit to Architect/Engineer for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
- B. Samples For Selection as Specified in Product Sections:

1. Submit to Architect/Engineer for aesthetic, color, or finish selection.
 2. Submit samples of finishes from full range of manufacturers' standard colors, or in custom colors selected, textures, and patterns for Architect/Engineer selection.
- C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- D. Include identification on each sample, with full Project information.
- E. Submit number of samples specified in individual specification sections; Architect/Engineer will retain one sample.
- F. Reviewed samples which may be used in the Work are indicated in individual specification sections.
- G. Samples will not be used for testing purposes unless specifically stated in specification section.
- H. After review, produce duplicates and distribute in accordance with SUBMITTAL PROCEDURES article and for record documents purposes.

1.6 TEST REPORTS

- A. Submit for Architect/Engineer's knowledge as contract administrator or for Owner.
- B. Submit test reports for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

1.7 CERTIFICATES

- A. When specified in individual specification sections, submit certification by manufacturer, installation/application subcontractor, or Contractor to Architect/Engineer, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect/Engineer.

1.8 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, to Architect/Engineer for delivery to Owner in quantities specified for Product Data.
- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

1.9 MANUFACTURER'S FIELD REPORTS

- A. Submit reports for Architect/Engineer's benefit as contract administrator or for Owner.
- B. Submit report in duplicate within 10 days of observation to Architect/Engineer for information.
- C. Submit for information for limited purpose of assessing conformance with information given and design concept expressed in Contract Documents.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

**WAIVER OF CLAIMS
FOR USE OF ELECTRONIC DATA**

CONTRACT/JOB NO.: _____

PROJECT DESCRIPTION: _____

DATA BEING RELEASED: _____

DATE: _____

LANCER ASSOCIATES, INC., makes the above information available to you without payment/with nominal payment on condition that you agree that Lancer Associates, Inc. has developed the information for its own use and for the use of its clients and, therefore, makes no representation, warranties or undertakings of any type concerning the accuracy or completeness of the information or its usefulness in relation to your consulting services. By receipt and use of this data transmitted herewith, you agree to and do indemnify and hold harmless Lancer Associates, Inc. against and from any and all claims, damage, liability, and/or costs, including reasonable attorney's fees, made or asserted by you or by any third party allegedly resulting from your use or transfer to any other party of the data being provided to you herewith by Lancer Associates, Inc., including but not limited to any claimed inaccuracies or incompleteness of the data and regardless of whether such claims, etc., involve the alleged negligence of Lancer Associates, Inc. in the preparation, recording, or transfer of the data.

Lancer Associates, Inc.

BY: _____

TITLE: _____

No data are to be used unless and until an authorized representative of the recipient shall have properly executed and returned **"WAIVER OF CLAIMS FOR USE OF ELECTRONIC DATA"** form.

ACKNOWLEDGED AND ACCEPTED THIS _____ DAY OF _____, 20____.

COMPANY: _____

BY: _____

TITLE: _____

The electronic data transmitted herewith is for the use of the intended recipient. If you have intercepted or received this transmittal in error, you are not authorized to use or distribute the information contained herein by any means or for any purpose, and Lancer Associates, Inc. requests that you communicate the unintended receipt to Lancer Associates, Inc. as soon as possible, and Lancer Associates, Inc. will make arrangements to recover the data transmitted herewith.

ELECTRONIC FILE FEES

\$100.00 per sheet or
\$2000.00 per set

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Quality control and control of installation.
- B. Tolerances
- C. References.
- D. Mock-up requirements.
- E. Testing and inspection services.
- F. Manufacturers' field services.
- G. Examination.
- H. Preparation.

1.2 QUALITY CONTROL AND 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. When manufacturers' instructions conflict with Contract Documents, request clarification from Architect/Engineer 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. Perform Work by persons qualified to produce required and specified quality.
- F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 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. When manufacturers' tolerances conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

1.4 REFERENCES

- A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to reference standard by date of issue current on date for receiving bids, except where specific date is established by code.
- C. Obtain copies of standards where required by product specification sections.
- D. When specified reference standards conflict with Contract Documents, request clarification from Architect/Engineer before proceeding.
- E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Architect/Engineer shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.5 MOCK-UP REQUIREMENTS

- A. Tests will be performed under provisions identified in this section and identified in respective product specification sections.
- B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mock-ups shall be comparison standard for remaining Work.
- D. Where mock-up has been accepted by Architect/Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so by Architect/Engineer.

1.6 TESTING AND INSPECTION SERVICES

- A. The Contractor shall employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing.
 - 1. Prior to start of Work, submit testing laboratory name, address, and telephone number, and names of full time Registered Professional Engineer and responsible officer.

2. Submit copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
- B. The independent firm will perform tests, inspections and other services specified in individual specification sections and as required by Architect/Engineer, Owner or Authority having jurisdiction.
1. Laboratory: Authorized to operate at Project location.
 2. Laboratory Staff: Maintain full time registered Professional Engineer on staff to review services.
 3. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards or accepted values of natural physical constants.
- C. Testing, inspections and source quality control may occur on or off project site. Perform off-site testing as required by Architect/Engineer or Owner.
- D. Reports will be submitted by independent firm to Architect/Engineer and Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.
- E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
1. Notify Architect/Engineer and independent firm 24 hours prior to expected time for operations requiring services.
 2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
- F. Testing and employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- G. Re-testing or re-inspection required because of non-conformance to specified requirements shall be performed by same independent firm on instructions by Architect/Engineer. Payment for re-testing or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- H. Agency Responsibilities:
1. Test samples of mixes submitted by Contractor.
 2. Provide qualified personnel at site. Cooperate with Architect/Engineer 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/Engineer and Contractor of observed irregularities or non-conformance of Work or products.
 6. Perform additional tests required by Architect/Engineer.
 7. Attend preconstruction meetings and progress meetings.

- I. Agency Reports: After each test, promptly submit two copies of report to Architect/Engineer and to Contractor. When requested by Architect/Engineer, provide interpretation of test results. Include the following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Name of inspector.
 - 4. Date and time of sampling or inspection.
 - 5. Identification of product and specifications section.
 - 6. Location in Project.
 - 7. Type of inspection or test.
 - 8. Date of test.
 - 9. Results of tests.
 - 10. Conformance with Contract Documents.

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

1.7 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect/Engineer 30 days in advance of required observations. Observer subject to approval of Architect/Engineer and Owner.
- C. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- D. Refer to Section 01 33 00 - SUBMITTAL PROCEDURES, MANUFACTURERS' FIELD REPORTS article.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify 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. Verify utility services are available, of correct characteristics, and in correct locations.

3.2 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 new material or substance in contact or bond.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary Utilities:
 - 1. Temporary electricity.
 - 2. Telephone service.
 - 3. Internet service.
 - 4. Temporary water service.
 - 5. Temporary sanitary facilities.

- B. Construction Facilities:
 - 1. Vehicular access.
 - 2. Parking.
 - 3. Progress cleaning and waste removal.
 - 4. Project identification.
 - 5. Traffic regulation.

- C. Temporary Controls:
 - 1. Barriers.
 - 2. Security.
 - 3. Water control.
 - 4. Dust control.

- D. Removal of utilities, facilities, and controls.

1.2 TEMPORARY ELECTRICITY

- A. Contractor shall pay cost of energy used. Establish power service to site.

- B. Provide power outlets, with branch wiring and distribution boxes located as required for construction operations. Provide flexible power cords as required for portable construction tools and equipment.

- C. Provide main service disconnect and over-current protection at convenient location.

- D. Permanent convenience receptacles may be utilized during construction.

- E. Provide distribution equipment, wiring, and outlets to provide single phase branch circuits for power and lighting.
 - 1. Provide 20 ampere duplex outlets, single phase circuits for power tools for every 500 sq ft of active work area.
 - 2. Provide 20 ampere, single phase branch circuits for lighting.

1.3 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
- B. Utilize existing ventilation equipment. Extend and supplement equipment with temporary fan units as required to maintain clean air for construction operations.

1.4 TELEPHONE SERVICE

- A. Provide, maintain, and pay for cell phone service to field personnel at time of project mobilization.

1.5 EMAIL SERVICE

- A. Provide, maintain and pay for email service and dedicated line to field office at time of project mobilization.

1.6 TEMPORARY SANITARY FACILITIES

- A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of project mobilization.

1.7 FIELD OFFICES AND SHEDS

- A. Office: Weather tight, with lighting, electrical outlets, heating, cooling and ventilating equipment, and equipped with sturdy furniture drawing rack, and drawing display table.
- B. Provide space for Project meetings, with table and chairs to accommodate 12 persons.
- C. Locate offices and sheds minimum distance of 30 feet from existing and new structures.
- D. Do not use permanent facilities for field offices or for storage.
- E. Construction: Portable or mobile buildings, or buildings constructed with floors raised above ground, securely fixed to foundations with steps and landings at entrance doors.
 - 1. Construction: Structurally sound, secure, weather tight enclosures for office and storage spaces. Maintain during progress of Work; remove when no longer needed.
 - 2. Temperature Transmission Resistance of Floors, Walls, and Ceilings: Compatible with occupancy and storage requirements.
 - 3. Exterior Materials: Weather resistant, finished in one color acceptable to Architect/Engineer.
 - 4. Interior Materials in Offices: Sheet type materials for walls and ceilings, pre-finished or painted; resilient floors and bases.
 - 5. Lighting for Offices: 50 ft C at desk top height, exterior lighting at entrance doors.
 - 6. Fire Extinguishers: Appropriate type fire extinguisher at each office and each storage area.

7. Interior Materials in Storage Sheds: As required to provide specified conditions for storage of products.
- F. Environmental Control:
 1. Heating, Cooling, and Ventilating for Offices: Automatic equipment to maintain 68 degrees F heating and 72 degrees F cooling.
 2. Storage Spaces: Heating and ventilation as needed to maintain products in accordance with Contract Documents; lighting for maintenance and inspection of products.
- G. Storage Areas And Sheds: Size to storage requirements for products of individual Sections, allowing for access and orderly provision for maintenance and for inspection of products.
- H. Preparation: Fill and grade sites for temporary structures sloped for drainage away from buildings.
- I. Installation:
 1. Install office spaces ready for occupancy 15 days after date fixed in Notice to Proceed.
 2. Parking: Two hard surfaced parking spaces for use by Owner and Architect/Engineer, connected to office by walk.
 3. Employee Residential Occupancy: Not allowed on Owner's property.
- J. Maintenance And Cleaning:
 1. Weekly janitorial services for offices; periodic cleaning and maintenance for office and storage areas.
 2. Maintain approach walks free of mud, water, and snow.
- K. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

1.8 VEHICULAR ACCESS

- A. Construct temporary all-weather access roads from public thoroughfares to serve construction area, of width and load bearing capacity to accommodate unimpeded traffic for construction purposes.
- B. Construct temporary bridges and culverts to span low areas and allow unimpeded drainage.
- C. Extend and relocate vehicular access as Work progress requires, provide detours as necessary for unimpeded traffic flow.
- D. Location approved by Owner.
- E. Provide unimpeded access for emergency vehicles. Maintain 20 feet wide driveways with turning space between and around combustible materials.

- F. Provide and maintain access to fire hydrants and control valves free of obstructions.
- G. Provide means of removing mud from vehicle wheels before entering streets.
- H. Do not use existing on-site roads for construction traffic.

1.9 PROGRESS CLEANING AND WASTE REMOVAL

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in 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 spaces.
- 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 rubbish from site weekly and dispose off-site.
- E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- E. Interior Enclosures:
 - 1. Provide temporary partitions 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.
 - 2. Construction: Framing and [reinforced polyethylene] [plywood] [gypsum board] sheet materials with closed joints and sealed edges at intersections with existing surfaces:
 - a. Insulated to R 19.
 - b. STC rating of 35 in accordance with ASTM E90.
 - c. Maximum flame spread rating of 75 in accordance with ASTM E84.
 - 3. Paint surfaces exposed to view from Owner occupied areas.

1.11 SECURITY

- A. Security Program:
 - 1. Protect Work existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
 - 2. Initiate program in coordination with Owner's existing security system at project mobilization.
 - 3. Maintain program throughout construction period until Owner occupancy.

- B. Entry Control:
 - 1. Restrict entrance of persons and vehicles into Project site and existing facilities.
 - 2. Allow entrance only to authorized persons with proper identification.
 - 3. Maintain log of workers and visitors, make available to Owner on request.
 - 4. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

- C. Personnel Identification:
 - 1. Provide identification badge to each person authorized to enter premises.
 - 2. Badge To Include: Personal photograph, name and assigned number and expiration date and employer.
 - 3. Maintain list of accredited persons, submit copy to Owner on request.
 - 4. Require return of badges at expiration of their employment on the Work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Products.
- B. Product delivery requirements.
- C. Product storage and handling requirements.
- D. Product options.
- E. Product substitution procedures.
- F. Equipment electrical characteristics and components.

1.2 PRODUCTS

- A. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.
- C. Furnish interchangeable components from same manufacturer for components being replaced.

1.3 PRODUCT DELIVERY REQUIREMENTS

- A. Transport and handle products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.4 PRODUCT STORAGE AND HANDLING REQUIREMENTS

- A. Store and protect products in accordance with manufacturers' instructions.
- B. Store with seals and labels intact and legible.

- C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.
- D. For exterior storage of fabricated products, place on sloped supports above ground.
- E. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products Specified by Reference Standards or by Description Only: Any product meeting those standards or description.
- B. Products Specified by Naming One or More Manufacturers: Products of one of manufacturers named and meeting specifications, no options or substitutions allowed.

1.6 PRODUCT SUBSTITUTION PROCEDURES

- A. Instructions to Bidders specify time restrictions for submitting requests for Substitutions during bidding period to requirements specified in this section.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor.
- C. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.
- D. A request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
 - 2. Will provide same warranty for Substitution as for specified product.
 - 3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension which may subsequently become apparent.
 - 5. Will reimburse Owner and Architect/Engineer for review or redesign services associated with re-approval by authorities having jurisdiction.

- E. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data submittals, without separate written request, or when acceptance will require revision to Contract Documents.
- F. Substitution Submittal Procedure:
 - 1. Submit electronic copy of request for Substitution for consideration. Limit each request to one proposed Substitution.
 - 2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on proposer.
 - 3. Architect/Engineer will notify Contractor in writing by addenda if accepted.

PART 2 PRODUCTS

2.1 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

- A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.
- B. Cord and Plug: Furnish minimum 6 foot (2 m) cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01 70 00

EXECUTION REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Closeout procedures.
- B. Final cleaning.
- C. Starting of systems.
- D. Demonstration and instructions.
- E. Protecting installed construction.
- F. Project record documents.
- G. Operation and maintenance data.
- H. Manual for materials and finishes.
- I. Manual for equipment and systems.
- J. Spare parts and maintenance products.
- K. Product warranties and product bonds.
- L. Maintenance service.

1.2 CLOSEOUT PROCEDURES

- A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Architect/Engineer's review.
- B. Provide submittals to Architect/Engineer required by authorities having jurisdiction.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final project assessment.

- B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.
- C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.4 STARTING OF SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems.
- B. Notify Architect/Engineer and Owner seven days prior to start-up of each item.
- C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify wiring and support components for equipment are complete and tested.
- F. Execute start-up under supervision of applicable manufacturer's representative and Contractors' personnel in accordance with manufacturers' instructions.
- G. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
- H. Submit a written report in accordance with Section 01 33 00 that equipment or system has been properly installed and is functioning correctly.

1.5 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. Demonstrate Project equipment by manufacturer's representative who is knowledgeable about the Project.

- C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time.
- F. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- G. Required instruction time for each item of equipment and system is specified in individual sections.

1.6 PROTECTING INSTALLED CONSTRUCTION

- A. Protect installed Work and provide special protection where specified in individual specification sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.
- E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.
- F. Prohibit traffic from landscaped areas.

1.7 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work. Make electronic updates at 25%, 50%, 75% and 100%.:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.

- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following. Keep electronic copy up to date and submit at 25%, 50%, 75% and 100%.:
 - 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: Keep electronic copy each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish first floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Contract drawings.
- G. Submit electronic As-built documents to Architect/Engineer at 25%, 50%, 75% and 100%.

1.8 OPERATION AND MAINTENANCE DATA

- A. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers. Also submit electronic copies on flash drive.
- B. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS", title of project, and subject matter of binder when multiple binders are required.
- C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- D. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages and electronic copies.
- E. Contents: Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
 - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.

- e. Maintenance instructions for equipment and systems.
- f. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
- 3. Part 3: Project documents and certificates, including the following:
 - a. Shop drawings and product data.
 - b. Air and water balance reports.
 - c. Certificates.
 - d. Originals of warranties and bonds.

1.9 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two printed copies and one electronic copy of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one hard copy and one electronic copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of hard copy and one electronic copy of revised final volumes in final form within 10 days after final inspection.
- E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.
- F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- H. Additional Requirements: As specified in individual product specification sections.
- I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.10 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit two hard copies and one electronic copy of preliminary draft or proposed formats and outlines of contents before start of Work. Architect/Engineer will review draft and return one copy with comments.

- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.
- C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Architect/Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two sets of revised final volumes in final form within 10 days after final inspection.
- E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
- F. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- G. Include color coded wiring diagrams as installed.
- H. 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 special operating instructions.
- I. 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.
- J. Include servicing and lubrication schedule, and list of lubricants required.
- K. Include manufacturer's printed operation and maintenance instructions.
- L. Include sequence of operation by controls manufacturer.
- M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- N. Include control diagrams by controls manufacturer as installed.
- O. Include Contractor's coordination drawings, with color coded piping diagrams as installed.
- P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- R. Include test and balancing reports.

- S. Additional Requirements: As specified in individual product specification sections.
- T. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.11 SPARE PARTS AND MAINTENANCE PRODUCTS

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

1.12 PRODUCT WARRANTIES AND PRODUCT BONDS

- A. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute submittals when required.
- E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.
- F. Submit prior to final Application for Payment.
- G. Time Of Submittals:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
 - 2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.13 MAINTENANCE SERVICE

- A. Furnish service and maintenance of components indicated in specification sections.
- B. Examine system components at frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

- C. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by manufacturer of original component.
- D. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
 - 1. Footings, Foundation Walls, and Piers.
 - 2. Slabs-on-grade.
- B. Related Sections:
 - 1. Section 312000 "Earth Moving" for drainage fill under slabs-on-grade.
 - 2. Section 321313 "Concrete Paving" for concrete pavement and walks.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect / Engineer.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.

4. Steel reinforcement and accessories.
5. Fiber reinforcement.
6. Curing compounds.
7. Bonding agents.
8. Adhesives.
9. Vapor barriers.
10. Semirigid joint filler.
11. Joint-filler strips.
12. Repair materials.

- B. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
1. Aggregates.
- C. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- D. Field quality-control reports.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. Testing Agency Qualifications: An independent agency, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specifications for Structural Concrete."
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- F. Concrete Testing Service: Owner will engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

- G. Mockups: For exposed slabs, cast concrete slab-on-ground panels to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.
 - 1. Build one panels approximately 10 feet by 10 feet (2.54 meters by 2.54 meters) in the location indicated or, if not indicated, as directed by Architect.
 - 2. Divide panel into four equal panels to demonstrate saw joint cutting.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 19 by 19 mm (3/4 by 3/4 inch) minimum, or as indicated on drawings.
- D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 25 mm (1 inch) to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes no larger than 25 mm (1 inch) in diameter in concrete surface.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 420 (Grade 60), deformed.
- B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM A 615/A 615M, Grade 420 (Grade 60), deformed bars, assembled with clips.

- C. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
- D. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 420 (Grade 60), plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
 - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2.4 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
 - 1. Portland Cement: ASTM C 150, Type I/II, gray.
- B. Normal-Weight Aggregates: ASTM C 33, coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- C. Water: ASTM C 94/C 94M and potable.

2.5 ADMIXTURES

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 4. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.
 - 5. Internal Curing: ASTM C494, Type S
 - a. E5 Internal Cure; Specification Products

2.6 FIBER REINFORCEMENT

- A. Synthetic Micro-Fiber: Fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 13 to 38 mm (1/2 to 1-1/2 inches) long.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fibrillated Micro-Fibers:
 - 1) Euclid Chemical Company (The), an RPM company; Fiberstrand F.
 - 2) FORTA Corporation; FORTA Ultra-Net.
 - 3) Grace Construction Products, W. R. Grace & Co.; Grace Fibers.
 - 4) Nycon, Inc.; ProConF.
 - 5) Propex Concrete Systems Corp.; Fibermesh 300.
 - 6) Sika Corporation; Sika Fiber PPF.

2.7 VAPOR BARRIERS

- A. Sheet Vapor Barrier: ASTM E 1745, Class A. Include manufacturer's recommended adhesive or pressure-sensitive tape.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Fortifiber Building Systems Group; Moistop Ultra 15.
 - b. Grace Construction Products, W. R. Grace & Co.; Florprufe 120.
 - c. Insulation Solutions, Inc.; Viper VaporCheck 16.
 - d. Meadows, W. R., Inc.; Perminator 15 mil.
 - e. Raven Industries Inc.; Vapor Block 15.
 - f. Reef Industries, Inc.; Griffolyn Type-105 15 mil Green.
 - g. Stego Industries, LLC; Stego Wrap 15 mil Class A.
- B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D 448, Size 57, with 100 percent passing a 37.5-mm (1-1/2-inch) sieve and 0 to 5 percent passing a 2.36-mm (No. 8) sieve.

2.8 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals - Building Systems; Confilm.
 - b. Conspec by Dayton Superior; Aquafilm.
 - c. Dayton Superior Corporation; Sure Film (J-74).
 - d. Edoco by Dayton Superior; BurkeFilm.
 - e. Euclid Chemical Company (The), an RPM company; Eucobar.
 - f. L&M Construction Chemicals, Inc.; E-CON.
 - g. Meadows, W. R., Inc.; EVAPRE.
 - h. Sika Corporation; SikaFilm.
 - i. Symons by Dayton Superior; Finishing Aid.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 305 g/sq. m (9 oz./sq. yd.) when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
 - 1. Products: Subject to compliance with requirements, provide one of the following:
 - a. BASF Construction Chemicals - Building Systems; Kure-N-Seal WB.
 - b. Conspec by Dayton Superior; Cure and Seal WB.
 - c. Dayton Superior Corporation; Safe Cure and Seal (J-18).
 - d. Edoco by Dayton Superior; Spartan Cote WB II.
 - e. Euclid Chemical Company (The), an RPM company; Aqua Cure VOX; Clearseal WB 150.
 - f. Meadows, W. R., Inc.; Vocomp-20.
 - g. Symons by Dayton Superior; Cure & Seal 18 Percent E.

2.9 RELATED MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 - 1. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 3.2 mm (1/8 inch) and that can be feathered at edges to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 3.2 to 6 mm (1/8 to 1/4 inch) or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 29 MPa (4100 psi) at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 6.4 mm (1/4 inch) and that can be filled in over a scarified surface to match adjacent floor elevations.
 - 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 3.2 to 6 mm (1/8 to 1/4 inch) or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 34.5 MPa (5000 psi) at 28 days when tested according to ASTM C 109/C 109M.

2.11 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 25 percent.
 2. Combined Fly Ash and Pozzolan: 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Refer to sheet S001 for specific mix designs and additional information.

2.13 FABRICATING REINFORCEMENT

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

2.14 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.
 1. When air temperature is between 30 and 32 deg C (85 and 90 deg F), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 32 deg C (90 deg F), reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
 - 1. Class A, 3.2 mm (1/8 inch) for smooth-formed finished surfaces.
 - 2. Class B, 6 mm (1/4 inch) for rough-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.
 - 1. Install keyways, recesses, and the like, for easy removal.
 - 2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork for sides of beams, walls, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 10 deg C (50 deg F) for 24 hours after placing concrete. Concrete has to be hard enough to not be

damaged by form-removal operations and curing and protection operations need to be maintained.

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR BARRIERS

- A. Sheet Vapor Barriers: Place, protect, and repair sheet vapor barrier according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 150 mm (6 inches) minimum or as required by manufacturer, and seal with manufacturer's recommended tape.
- B. Granular Course: Install granular fill, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 mm (0 inch) or minus 19 mm (3/4 inch).

3.5 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- 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. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.
 - 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. Form keyed joints as indicated. Embed keys at least 38 mm (1-1/2 inches) into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 5. Space vertical joints in walls as necessary based on the method of installation. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 3.2-mm- (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.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 13 mm (1/2 inch) or more than 25 mm (1 inch) below finished concrete surface where joint sealants, specified in Section 079200 "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.
 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of

weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 150 mm (6 inches) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- 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 darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 4.4 deg C (40 deg F) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 306.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- G. Hot-Weather Placement: Comply with ACI 305 and as follows:
1. Maintain concrete temperature below 32 deg C (90 deg F) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.8 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and

defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view.
- C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:
1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.9 FINISHING FLOORS AND SLABS

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighen until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155M (ASTM E 1155), for a randomly trafficked floor surface:
 - a. Slabs-on-grade: Specified overall values of flatness:
 - 1) Specified overall values of flatness, F F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15
- C. Trowel and Fine-Broom Finish: Apply a first trowel finish to where ceramic or quarry tile is to be installed by either thickset or thin-set method. While concrete is still plastic, slightly scarify surface with a fine broom perpendicular to main traffic route.
1. Coordinate required final finish with Architect before application.
 2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, Natatorium pool deck, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

2. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.

3.10 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 2. Construct concrete bases 100 mm (4 inches) high unless otherwise indicated; and extend base not less than 6 inches (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
 3. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch (450-mm) centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base, and anchor into structural concrete substrate.
 6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported equipment.

3.11 CONCRETE PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

3.12 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least two months. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.13 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect's approval, using epoxy adhesive and patching mortar.

- F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.14 FIELD QUALITY CONTROL

- A. Testing: Contractor will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.
- B. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
 2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
 4. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 6. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
 10. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- C. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24 hours of finishing.

END OF SECTION 033000

SECTION 03 39 00

CONCRETE SEALING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes sealing exposed floors.

1.2 REFERENCES

A. American Concrete Institute:

1. ACI 301 - Specifications for Structural Concrete.
2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
3. ACI 308.1 - Standard Specification for Curing Concrete.
4. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:

1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

- A. Division 01 Submittal procedures.
- B. Product Data: Submit data on curing compounds, mats, paper, film, compatibilities, and limitations.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 ACI 302.1 ACI 318.
- B. Perform work in accordance with applicable requirements of governing authorities have jurisdiction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements : Product storage and handling requirements.
- B. Deliver curing materials in manufacturer's packaging including application instructions.

PART 2 PRODUCTS

2.1 SEALERS FOR EXPOSED CONCRETE FLOORS

- A. Acceptable Products: Subject to compliance with requirements, provide one of the following:
 - 1. Clear, Waterborne, Membrane-Forming Sealing Compound:
 - a. Klear-Lote Cure-Sealer-Hardener, 30 percent solids; Burke by Edoco.
 - b. Polyseal WB; ChemMasters.
 - c. UV Safe Seal; Lambert Corporation.
 - d. Lumiseal WB Plus; L & M Construction Chemicals, Inc.
 - e. Vocomp-30; W. R. Meadows, Inc.
 - f. Metcure 30; Metalcrete Industries.
 - g. Or Equal.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify substrate surfaces are ready to be cured.

3.2 INSTALLATION OF SEALER

- A. Follow the manufacturer's recommendations.

3.3 PROTECTION OF FINISHED WORK

- A. Division 01 - Execution Requirements: Protecting finished Work.
- B. Do not permit traffic over unprotected floor surface.

END OF SECTION

SECTION 04 05 13

MASONRY MORTAR AND GROUT

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes mortar and grout for masonry.

1.2 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM C91 - Standard Specification for Masonry Cement.
 - 2. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
 - 3. ASTM C150 - Standard Specification for Portland Cement.
 - 4. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
 - 5. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
 - 6. ASTM C387 - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
 - 7. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
 - 8. ASTM C476 - Standard Specification for Grout for Masonry.
 - 9. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - 10. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
 - 11. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
 - 12. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
 - 13. ASTM C1314 - Standard Test Method for Constructing and Testing Masonry Prisms Used to Determine Compliance with Specified Compressive Strength of Masonry.
 - 14. ASTM C1329 - Standard Specification for Mortar Cement.
 - 15. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength.
- B. The Masonry Society:
 - 1. TMS MSJC - Building Code for Masonry Structures (ACI 530/ASCE 5/TMS 402), Specification for Masonry Structures (ACI 530.1/ASCE 6/TMS 602) and Commentaries.

1.3 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal requirements.
- B. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.

- D. Test Reports:
 - 1. Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 or mortar to requirements of ASTM and test and evaluation reports to ASTM C780 for aggregate ratio and water content, air content, consistency and compressive strength.
 - 2. Submit reports on grout indicating conformance of grout to property requirements of ASTM and test and evaluation reports to ASTM C1019.
- E. Manufacturer's Installation Instructions: Submit premix mortar manufacturer's installation instructions.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with TMS MSJC Code and TMS MSJC Specification.
- B. Maintain one copy of each document on site.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Hot and Cold Weather Requirements: TMS MSJC Specification.

PART 2 PRODUCTS

2.1 MORTAR AND MASONRY GROUT

- A. Manufacturers:
 - 1. Blue Circle Cement.
 - 2. Citadel Cement.
 - 3. CTS Cement Manufacturing Co.
 - 4. Lehigh Portland Cement.
 - 5. Medusa Cement Co.
 - 6. The Quikrete Companies.
 - 7. Solomon Colors.
 - 8. Southern Grouts and Mortars.

2.2 COMPONENTS

- A. Portland Cement: ASTM C150, Type I.
- B. Masonry Cement: ASTM C91, Type S, gray color.
- C. Mortar Cement: ASTM C1329, Types S, gray color.

- D. Premix Mortar: ASTM C387, Type S, using gray color cement.
- E. Mortar Aggregate: ASTM C144, standard masonry type.
- F. Hydrated Lime: ASTM C207, Type S.
- G. Grout Aggregate: ASTM C404, fine and coarse.
- H. Water: Clean and potable.
- I. Cold Weather Admixture: Accelguard 80 by Euclid or Trimix-NCA Sonneborn Div. Of ChemRex.
- J. Water Repellent Admixture: Dry-block by W.R. Grace or Rheopel by Master Builders.
- K. Calcium chloride is not permitted.

2.3 MIXES

- A. Mortar Mixes:
 - 1. Use ASTM C270, Type S, for reinforced masonry and where indicated.
- B. Mortar Mixing:
 - 1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
 - 2. Achieve uniformly damp sand immediately before mixing process.
 - 3. Re-temper only within two hours of mixing.
- C. Grout Mixes:
 - 1. Grout for Non-Structural Masonry: 3,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 Coarse or Fine grout.
 - 2. Grout for Structural Masonry: 3,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 Coarse or Fine grout.
 - 3. Application:
 - a. Coarse Grout: For grouting spaces with minimum 4 inches dimension in every direction.
 - b. Fine Grout: For grouting other spaces.
- D. Grout Mixing:
 - 1. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476.
 - 2. Add admixtures; mix uniformly.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Request inspection of spaces to be grouted.

3.2 INSTALLATION

- A. Install mortar and grout in accordance with TMS MSJC Specification.

3.3 FIELD QUALITY CONTROL

- A. Section 01 40 00 - Quality Requirements: Testing and Inspection Services.
- B. Testing of Mortar Mix: In accordance with ASTM C780 for aggregate ratio and water content, air content, consistency, and compressive strength.
- C. Testing of Grout Mix: In accordance with ASTM C1019 for compressive strength, and in accordance with ASTM C143/C143M for slump.

END OF SECTION

SECTION 04 21 00

UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes concrete masonry units; reinforcement, anchorage, and accessories.

1.2 REFERENCES

- A. American Society for Testing and Materials:
1. ASTM A153/A153M - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 2. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 3. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 4. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 5. ASTM A951 - Standard Specification for Masonry Joint Reinforcement.
 6. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale).
 7. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units.
 8. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.
 9. ASTM C140 - Standard Test Methods of Sampling and Testing Concrete Masonry Units.
 10. ASTM C212 - Standard Specification for Structural Clay Facing Tile.
 11. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
- B. The Masonry Society:
1. TMS MSJC - Building Code for Masonry Structures (ACI 530/ASCE 5/TMS 402), Specification for Masonry Structures (ACI 530.1/ASCE 6/TMS 602) and Commentaries.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide unit masonry that develops the following net-area compressive strength (f'_m) at 28 days. Determine compressive strength on masonry by testing masonry prisms according to ASTM C1314.
1. For Concrete Unit Masonry: $f'_m = 2000$ p.s.i.

1.4 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

- B. Product Data: Submit data for decorative masonry units and fabricated wire reinforcement, wall ties, anchors and other accessories.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- D. Test Reports: Submit test results indicating compressive strength, water absorption, saturation and suction.
- E. Shop drawings: Show fabrication and installation details for following:
 - 1. Reinforcing Steel: Provide detailed drawings that give the quantity, size, dimensions, spacing, locations, bends, lap lengths, and other information required for reinforcement fabrication and installation. Comply with ACI 315, "Detail and Detailing of Concrete Reinforcement."
Show elevation of each reinforced walls with information noted above.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with TMS MSJC Code and TMS MSJC Specification.
- B. Fire Performance Characteristics: Where fire-resistance ratings are indicated, provide materials and construction which are identical to those of assemblies who fire endurance has been determined by testing in compliance with ASTM E119 by a recognized testing and inspecting organization or by another means, as acceptable to authorities having jurisdiction.
- C. Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

1.6 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements.
- B. Cold Weather Requirements: IMIAC – Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- C. Perform the following construction procedures while masonry work is progressing. Temperature ranges indicated below apply to air temperatures existing at time of installation except for grout. For grout, temperature ranges apply to anticipated minimum night

temperatures. In heating mortar and grout materials, maintain mixing temperature selected within 10 degrees F.

1. 40 degrees F to 32 degrees F:
 - a. Mortar: Heat mixing water to produce mortar temperature between 40 degrees F and 120 degrees F.
 - b. Grout: Follow normal masonry procedures.

2. 32 degrees F to 25 degrees F:
 - a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F and 120 degrees F; maintain temperature of mortar on boards above freezing.
 - b. Grout: Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.

3. 25 degrees F to 20 degrees F:
 - a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F and 120 degrees F; maintain temperature of mortar on boards above freezing.
 - b. Grout: Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.
 - c. Heat both sides of walls under construction using salamanders or other heat sources.
 - d. Use windbreaks or enclosures when wind is in excess of 15 mph.

4. 20 degrees F and below:
 - a. Mortar: Heat mixing water and sand to produce mortar temperatures between 40 degrees F and 120 degrees F:
 - b. Grout: Heat grout materials to 90 degrees F to produce in-place grout temperature of 70 degrees F at end of work day.
 - c. Masonry Units: Heat masonry units so that they are above 20 degrees F at time of laying.
 - d. Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 degrees F for 24 hours after laying units.
 - e. Do not heat water for mortar and grout to above 160 degrees F.

- D. Protect completed masonry and masonry not being worked on in the following manner. Temperature ranges indicated apply to mean daily air temperatures except for grouted masonry. For grouted masonry temperature ranges apply to anticipated minimum night temperatures.
 1. 40 degrees F to 32 degrees F:
 - a. Protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

 2. 32 degrees F to 25 degrees F:
 - a. Completely cover masonry with weather-resistive membrane for at least 24 hours.

3. 25 degrees F to 20 degrees F:
 - a. Completely cover masonry with weather-resistive insulating blankets or similar protection for at least 24 hours, 48 hours for grouted masonry.
4. 20 degrees F and below:
 - a. Except as otherwise indicated, maintain masonry temperature above 32 degrees F for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps or other methods proven to be satisfactory. For grouted masonry maintain heated enclosure to 40 degrees F for 48 hours.

1.9 PROJECT CONDITIONS

- A. Protection of Masonry: 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.
 1. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
 2. Where one wythe of multwythe masonry walls is completed in advance of other wythe, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.
- B. Do not apply uniform floor or roof loads for a least 12 hours and concentrated loads for Least 3 days after building masonry walls or columns.

1.10 COORDINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Coordinate masonry work with installation of window and door anchors.

PART 2 PRODUCTS

2.1 COMPONENTS

- A. Hollow Load Bearing Concrete Masonry Units (CMU): ASTM C90, Type I - Moisture Controlled; normal weight.
- B. Concrete Masonry Unit Size and Shape: Nominal modular size (width) as indicated on the Drawings. Furnish special units for 90 degree corners, bond beams, lintels, bullnosed corners. Provide bullnose units for outside corner, unless otherwise indicated.

2.2 LINTELS

- A. Build-In-Place Masonry Lintels. Use specially formed bond beam units with reinforcing bars placed as indicated and filled with coarse grout. Temporarily support built-in-place lintels until cured.

- B. Steel Lintels: Sizes as indicated on the drawings, hot-dip galvanized.

2.3 ACCESSORIES

- A. Single Wythe Joint Reinforcement: Truss type; steel wire, hot dip galvanized to ASTM A641 Class 3 after fabrication; 3/16 inch side rods with 9 gage cross ties.
- B. Multiple Wythe Joint Reinforcement: Truss type; with moisture drip; steel wire, hot dip galvanized to ASTM A641 Class 3 after fabrication, 3/16 inch side rods, 9 gage cross ties.
- C. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
- D. Strap Anchors: bent steel shape, as detailed on drawings, hot dip galvanized to ASTM A153 B2 finish.
- E. Wall Ties (CMU Back-up): Formed steel wire, 9 gage thick, adjustable, eye and pintle type, hot dip galvanized to ASTM A153 B2 finish.
- F. Anchor Bolts: Headed, J-shaped or L-shaped.
- G. Mortar and Grout: As specified in Section 04 05 13.
- H. Flashings: 40 mil thick non asphaltic composite membrane “TeXtro Flash Hohman & Barnard or 3 oz/sq ft rolled sheet copper bonded to fiber reinforced asphalt treated Kraft paper; “Cop-R-Tex” manufactured by Wasco or equal of AFCO, Hohmann& Barnard, Sandell or York.
- I. Termination Bars: Hohmann & Barnard T2 Aluminum Termination Bar, 14 ga. Or equal.
- J. Sealant for Termination Bars: Hohmann & Barnard HB Sealant or equal
- K. Drip Plate/Edge: Hohman & Barnard DP-LB 26 gauge type 304 stainless steel or equal.
- L. Vermiculite Insulation: Meeting ASTM C516-19.
- M. Preformed Control Joints: Rubber, Neoprene or Polyvinyl chloride material. Furnish with corner and tee accessories, heat or cement fused joints.
- N. Joint Filler: Closed cell polyethylene ; oversized 50 percent to joint width; self expanding; maximum lengths.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: coordination and project conditions.

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

3.2 PREPARATION

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

3.3 INSTALLATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form bed and head joints of uniform thickness.
- C. Coursing of Concrete Masonry Units:
 1. Bond: Running. Unless Stacked is indicated.
 2. Coursing: One unit and one mortar joint to equal 8 inches.
 3. Mortar Joints: Concave typical; Flush where a direct applied finish occurs other than paint.
- D. Placing And Bonding:
 1. Lay solid masonry units in full bed of mortar, with full head joints.
 2. Lay hollow masonry units with face shell bedding on head and bed joints.
 3. Buttering corners of joints or excessive furrowing of mortar joints are not permitted.
 4. Remove excess mortar as work progresses.
 5. Interlock intersections and external corners.
 6. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment is required, remove mortar and replace.
 7. Perform job site cutting of masonry units with proper tools to assure straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
 8. Cut mortar joints flush where wall tile is scheduled.
 9. Isolate masonry from vertical structural framing members with movement joint.
 10. Isolate top of masonry from horizontal structural framing members and slabs or decks with compressible joint filler.
- E. Joint Reinforcement And Anchorage - Single Wythe Masonry:
 1. Install horizontal joint reinforcement 16 inches oc., unless otherwise indicated.
 2. Install horizontal joint reinforcement 8 inches oc., at parapet walls
 3. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 4. Place joint reinforcement continuous in first and second joint below top of walls.
 5. Lap joint reinforcement ends minimum 6 inches.

6. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- F. Joint Reinforcement And Anchorage - Masonry Veneer:
1. Install horizontal joint reinforcement 16 inches oc., unless otherwise indicated.
 2. Install horizontal joint reinforcement 8 inches oc., at parapet walls.
 3. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 4. Place joint reinforcement continuous in first and second joint below top of walls.
 5. Lap joint reinforcement ends minimum 6 inches.
 6. Embed wall ties in masonry backing to bond veneer at maximum 16 inches oc vertically and 16 inches oc horizontally. Place at maximum 3 inches oc each way around perimeter of openings, within 12 inches of openings.
 7. Secure anchors to stud framed backing and embed into masonry veneer at maximum 16 inches oc vertically and 16 inches oc horizontally. Place at maximum 3 inches oc each way around perimeter of openings, within 12 inches of openings.
 8. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- G. Joint Reinforcement And Anchorages - Cavity Wall Masonry:
1. Install horizontal joint reinforcement 16 inches oc., unless otherwise indicated.
 2. Install horizontal joint reinforcement 8 inches oc., at parapet walls
 3. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 4. Place joint reinforcement continuous in first and second joint below top of walls.
 5. Lap joint reinforcement ends minimum 6 inches.
 6. Embed anchors in concrete. Attach to structural steel members. Embed anchorages in every second block and sixth brick joint.
 7. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- H. Reinforcement And Anchorages - Multiple Wythe Unit Masonry:
1. Install horizontal joint reinforcement 16 inches oc., unless otherwise indicated.
 2. Install horizontal joint reinforcement 8 inches oc., at parapet walls.
 3. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
 4. Place joint reinforcement continuous in first and second joint below top of walls.
 5. Lap joint reinforcement ends minimum 6 inches.
 6. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.
 7. Embed anchors embedded in concrete or attached to structural steel members. Embed anchorages in every second block or sixth brick joint.
 8. Reinforce joint corners and intersections with strap anchors 16 inches oc.
- I. Masonry Flashings:
1. Extend flashings horizontally through outer wythe at foundation walls, above ledge or shelf angles and lintels, under parapet caps, at bottom of walls, and turn down on outside face to form drip.
 2. Turn flashing up minimum 8 inches and bed into mortar joint of masonry or seal to concrete or seal to sheathing over backing.
 3. Lap end joints minimum 6 inches and seal watertight.

4. Turn flashing, fold, and seal at corners, bends, and interruptions.

J. Lintels:

1. Provide masonry lintels where shown and where openings of more than 12 inches for brick-size units and 24 inches for block-size units are shown without structural steel or other supporting lintels.
2. Provide minimum bearing for 8 inches at each jamb, unless otherwise indicated.

K. Grouted Components:

1. Reinforce bond beam with 2 No. 5 bars, 2 inch from bottom web.
2. Reinforce pilaster with bars, as detailed on the drawings.
3. Lap splices bar diameters required by code.
4. Support and secure reinforcing bars from displacement. Maintain position within ½ inch dimensional location.
5. Place and consolidate grout fill without displacing reinforcing.
6. At bearing locations, fill masonry cores with grout for required bearing, both sides of opening; refer to the lintel schedule on the Drawings.

L. Reinforced Masonry:

1. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.
2. Place mortar in masonry unit bed joints back ¼ inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure 7 days before packing grout.
3. Place reinforcement bars as indicated on Drawings.
4. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters.
5. Splice reinforcement as indicated.
6. Support and secure reinforcement from displacement.
7. Place and consolidate grout fill without displacing reinforcing.
8. Place grout in accordance with TMS MSJC Specification.

M. Control And Expansion Joints:

1. General: Install control and expansion joints in unit masonry where indicated. Build-in related items as masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.
2. If locations of control joints are not indicated on the Drawings provide as follows. Not less than a control joint every 25' of wall. Other locations are at changes in wall height or thickness, at construction joints in foundations, roof or floors, at chases and recesses for piping, columns and fixtures, at one side of wall openings 6' or less and both sides of wall openings over 6'. If the shape and design of the structure causes excessive number of control joints, review locations with Architect.
3. Do not continue horizontal joint reinforcement through control and expansion joints.
4. Install preformed control joint device in continuous lengths. Seal butt and corner joints.
5. Size control joint in accordance with Section 07900 for sealant performance.

6. Form expansion joint by omitting mortar and cutting unit to form open space.

N. Built-In Work:

1. As work progresses, install built-in metal door and glazed frames, fabricated metal frames, window frames, anchor bolts, and other items to be built-in the work and furnished by other sections.
2. Install built-in items plumb and level.
3. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
4. Do not build in materials subject to deterioration.

O. Cutting And Fitting:

1. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other sections of work to provide correct size, shape, and location.
2. Obtain Architect/Engineer's approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.4 ERECTION TOLERANCES

- A. Section 01 40 00 - Quality Requirements: Tolerances.
- B. Maximum Variation From Alignment of Columns and Pilasters: 1/4 inch.
- C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.
- D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.
- E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.
- G. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.5 FIELD QUALITY CONTROL

- A. Section 01 40 00 – Quality Requirements: Testing and Inspection Services.
- B. Concrete Masonry Units: Test each type in accordance with ASTM C140.

3.6 CLEANING

- A. Section 01 70 00 - Execution Requirements: Final cleaning.
- B. Remove excess mortar and mortar smears as work progresses.

- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution.
- E. Use non-metallic tools in cleaning operations.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes shop fabricated metal items.
 - 1. Lintels.
 - 2. Structural supports for miscellaneous attachments.
 - 3. Bollards.
 - 4. Downspout boots.
 - 5. Other items as indicated on the Drawings.

1.2 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM A36 - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 - 3. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 4. ASTM A283/283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
 - 5. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - 6. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
 - 7. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
- B. American Welding Society:
 - 1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
 - 2. AWS D1.1 - Structural Welding Code - Steel.
- C. SSPC: The Society for Protective Coatings:
 - 1. SSPC - Steel Structures Painting Manual.
 - 2. SSPC SP 1 - Solvent Cleaning.
 - 3. SSPC Paint 15 - Steel Joist Shop Paint.
 - 4. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal requirements.

- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.
- C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Accept metal fabrications on site in labeled shipments. Inspect for damage.
- C. Protect metal fabrications from damage by exposure to weather.

1.5 FIELD MEASUREMENTS

- A. Verify field measurements are as indicated on shop drawings.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A53, Grade B, Schedule 40.
- E. Fasteners.
- F. Bolts, Nuts, and Washers: ASTM A325 galvanized to ASTM A153 for galvanized components.
- G. Welding Materials: AWS D1.1; type required for materials being welded.
- H. Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide.
- I. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic or Type II Organic, zinc rich.

2.2 LINTELS

- A. Lintels: Steel sections, size and configuration as indicated on Drawings, length to allow specified bearing on both sides of opening as indicated on the drawings.
 - 1. Exterior Locations: Galvanized.
 - 2. Interior Locations: Prime paint, one coat.

2.3 STRUCTURAL SUPPORTS

- A. Other Structural Supports: Steel sections, shape and size as indicated on Drawings required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat.

2.4 BOLLARDS

- A. Provide steel bollards as indicated on the drawings. Steel bollards shall be hot dipped galvanized.

2.5 DOWNSPOUT BOOTS

- A. Provide cast iron downspout boots as indicated on the drawings and manufactured by Neenah Enterprises.

2.6 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Continuously seal joined members by continuous welds.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.7 FACTORY APPLIED FINISHES - STEEL

- A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
- B. Do not prime surfaces in direct contact with concrete or where field welding is required.
- C. Prime paint items with one coat except where galvanizing is specified.

- D. Galvanized Items: Galvanized after fabrication to ASTM A123. Furnish minimum 2.0 oz/sq ft galvanized coating.

2.8 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

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Make provisions for erection stresses. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.
- C. Field weld components indicated on Drawings.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval of Architect/Engineer prior to site cutting or making adjustments not scheduled.
- F. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

3.4 ERECTION TOLERANCES

- A. Division 01 - Quality Requirements: Tolerances.
- B. Maximum Variation From Plumb: 1/4 inch per story or for every 12 ft in height whichever is greater, non-cumulative.
- C. Maximum Offset From Alignment: 1/4 inch.
- D. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 05 5210 - PIPE AND TUBE RAILINGS

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Scope: Work of this Section shall include all materials and installation necessary to provide pipe and tube railings as shown and detailed on the Drawings and specified herein.
- B. This Section includes the following:
 - 1. Steel pipe and tube handrails and railings.

1.02 SUBMITTALS

- A. Product Data: For the following:
 - 1. Manufacturer's product lines of mechanically connected handrails and railings.
 - 2. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Show fabrication and installation of handrails and railings. Include plans, elevations, sections, component details, and attachments to other Work.
- C. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for products with factory-applied color finishes.
- D. Samples for Initial Selection: Short sections of railing or flat, sheet metal samples showing available mechanical finishes.
- E. Samples for Verification: For each type of exposed finish required, prepared on components indicated below and of same thickness and metal indicated for the Work. If finishes involve normal color and texture variations, include sample sets showing the full range of variations expected.
 - 1. ±6 inch long sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
 - 2. Fittings and brackets.
 - 3. Assembled sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Sample need not be full height.

1.03 STORAGE

- A. Store handrails and railings in a dry, well-ventilated, weather tight place.

1.04 PROJECT CONDITIONS

- A. Field Measurements: Verify handrail and railing dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.05 COORDINATION

- A. Coordinate installation of anchorages for handrails and railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry.

1.06 SCHEDULING

- A. Schedule installation so handrails and railings are mounted only on completed walls. Do not support temporarily by any means that does not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.01 METALS

- A. General: Provide metal free from pitting, seam marks, roller marks, stains, discolorations, and other imperfections where exposed to view on finished units.
- B. Steel and Iron: Provide steel and iron in the form indicated, complying with the following requirements:
 - 1. Steel Pipe: ASTM A 53; finish, type, and weight class as follows:
 - a. Black finish, unless otherwise indicated.
 - b. Galvanized finish for exterior installations and where indicated.
 - c. Type F, or Type S, Grade A, standard weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 2. Steel Tubing: Cold-formed steel tubing, ASTM A 500, Grade A, unless another grade is required by structural loads.
 - 3. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
 - 4. Iron Castings: Malleable iron complying with ASTM A 47, Grade 32510 (ASTM A47M, Grade 22010).
- C. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.02 WELDING MATERIALS, FASTENERS, AND ANCHORS

- A. Welding Electrodes and Filler Metal: Provide type and alloy of filler metal and electrodes as recommended by producer of metal to be welded and as required for color match, strength, and compatibility in fabricated items.
- B. Fasteners for Anchoring Handrails and Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring handrails and railings to other types of construction indicated and capable of withstanding design loads.

1. For aluminum handrails and railings, use fasteners fabricated from Type 304 or Type 316 stainless steel.
- C. Fasteners for Interconnecting Handrail and Railing Components: Use fasteners fabricated from same basic metal as fastened metal, unless otherwise indicated. Do not use metals that are corrosive or incompatible with materials joined.
1. Provide concealed fasteners for interconnecting handrail and railing components and for attaching them to other work, unless otherwise indicated.
 2. Provide concealed fasteners for interconnecting handrail and railing components and for attaching them to other work unless exposed fasteners are unavoidable or are the standard fastening method for handrails and railings indicated.
 3. Provide Phillips flat-head machine screws for exposed fasteners, unless otherwise indicated.
- D. Cast-in-Place and Postinstalled Anchors: Anchors of type indicated below, fabricated from corrosion-resistant materials with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.
1. Cast-in-place anchors.
 2. Expansion anchors.

2.03 PAINT

- A. Shop Primers: Provide primers to comply with applicable requirements in Division 09 Section "Painting."

2.04 GROUT AND ANCHORING CEMENT

- A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.05 FABRICATION

- A. General: Fabricate handrails and railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.

- B. Assemble handrails and railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cylindrical cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of handrail and railing components.
- D. Welded Connections: Fabricate handrails and railings for connecting members by welding. Cope components at perpendicular and skew connections to provide close fit, or use fittings designed for this purpose. Weld connections continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove flux immediately.
 - 4. At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- E. Nonwelded Connections: Fabricate handrails and railings by connecting members with concealed mechanical fasteners and fittings, unless otherwise indicated. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
- F. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect handrail and railing members to other work, unless otherwise indicated.
- G. Provide inserts and other anchorage devices for connecting handrails and railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by handrails and railings. Coordinate anchorage devices with supporting structure.
- H. For railing posts set in concrete, provide preset sleeves of steel not less than 6 inch long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, and steel plate forming bottom closure.
- I. Shear and punch metals cleanly and accurately. Remove burrs from exposed cut edges.
- J. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- K. Cut, reinforce, drill, and tap components, as indicated, to receive finish hardware,

screws, and similar items.

- L. Provide weep holes or another means to drain entrapped water in hollow sections of handrail and railing members that are exposed to exterior or to moisture from condensation or other sources.
- M. Fabricate joints that will be exposed to weather in a watertight manner.
- N. Close exposed ends of handrail and railing members with prefabricated end fittings.
- O. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of railing and wall is 1/4 inch or less.
- P. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.06 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Provide any exposed fasteners with finish matching appearance, including color and texture, of handrails and railings.

2.07 STEEL FINISHES

- A. Galvanized Handrails and Railings: Hot-dip galvanize exterior steel and iron handrails and railings to comply with ASTM A 123. Hot-dip galvanize hardware for exterior steel and iron handrails and railings to comply with ASTM A 153/A 153M.
- B. Galvanizing: Hot-dip galvanize items as indicated to comply with applicable standard listed below:
 - 1. ASTM A 123, for galvanizing steel and iron products.
 - 2. ASTM A 153/A 153M, for galvanizing steel and iron hardware.
- C. Fill vent and drain holes that will be exposed in finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- D. For galvanized handrails and railings, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
- E. Preparation for Shop Priming: After galvanizing, thoroughly clean handrails and

railings of grease, dirt, oil, flux, and other foreign matter, and treat with metallic-phosphate process.

- F. Apply shop primer to prepared surfaces of handrail and railing components, unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
 - 1. Stripe paint edges, corners, crevices, bolts, and welds.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.02 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required to install handrails and railings. Set handrails and railings accurately in location, alignment, and elevation; measured from established lines and levels and free from rack.
 - 1. Do not weld, cut, or abrade surfaces of handrail and railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3. Align rails so variations from level for horizontal members and from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals with a heavy coat of bituminous paint.
- D. Adjust handrails and railings before anchoring to ensure matching alignment at abutting joints. Space posts at interval indicated, but not less than that required by structural loads.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing handrails and railings and for properly transferring loads to in-place construction.

3.03 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently

connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of handrails and railings.

- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.04 ANCHORING POSTS

- A. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts have been inserted into sleeves, fill annular space between post and sleeve with the following anchoring material, mixed and placed to comply with anchoring material manufacturer's written instructions:
- B. Cover anchorage joint with flange of same metal as post, attached to post as follows:
 - 1. By set screws.
- C. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - 1. For aluminum pipe railings, attach posts as indicated using fittings designed and engineered for this purpose.
- D. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.05 ANCHORING RAILING ENDS

- A. Anchor railing ends into concrete and masonry with round flanges connected to railing ends and anchored into wall construction with postinstalled anchors and bolts.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces.
 - 1. Connect flanges to railing ends using nonwelded connections.

3.06 ATTACHING HANDRAILS TO WALLS

- A. Attach handrails to wall with wall brackets. Provide bracket with 1-1/2 inch clearance from inside face of handrail and finished wall surface.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

- C. Secure wall brackets to building construction as follows:
1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 2. For hollow masonry anchorage, use toggle bolts.
 3. For wood stud partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with carpentry work to locate backing members.
 4. For steel-framed gypsum board assemblies, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
 5. For steel-framed gypsum board assemblies, fasten brackets directly to steel framing or concealed reinforcements using self-tapping screws of size and type required to support structural loads.

3.07 CLEANING

- A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material.
- C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 Section "Painting."
- D. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780.

3.08 PROTECTION

- A. Protect finishes of handrails and railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at the time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit or provide new units.

END OF SECTION 05 5210

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Wood blocking and nailers.

1.2 ACTION SUBMITTALS

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

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSB Board of Review.

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

1. Wood-preservative-treated wood.
2. Fire-retardant-treated wood.
3. Power-driven fasteners.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency

certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Provide dressed lumber, S4S, unless otherwise indicated.

C. Maximum Moisture Content of Lumber: 19 percent

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

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

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

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

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

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

1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, sleepers, blocking, [furring,] [stripping,] and similar concealed members in contact with masonry or concrete.
3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
5. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 FIRE-RETARDANT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.

1. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
- E. Application: Treat items indicated on Drawings, and the following:
 1. Framing for raised platforms.

2.4 DIMENSION LUMBER FRAMING

- A. Framing Other Than Non-Load-Bearing Interior Partitions: No. 2 grade.
 1. Application: Framing other than interior partitions.
 2. Species:
 - a. Southern pine; SPIB.

2.5 MISCELLANEOUS LUMBER

- A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 1. Blocking.
 2. Nailers.
- B. For items of dimension lumber size, provide No. 2 grade lumber of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and the following species and grades:
 1. Mixed southern pine; No. 2 grade; SPIB.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Power-Driven Fasteners: NES NER-272.
- C. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

2.7 MISCELLANEOUS MATERIALS

- A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.
- B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.
- C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Install fire-retardant treated plywood backing panels with classification marking of testing agency exposed to view.
- E. Shear Wall Panels: Install shear wall panels to comply with manufacturer's written instructions.
- F. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- G. Do not splice structural members between supports unless otherwise indicated.
- H. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
- I. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.

3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.

3.2 PROTECTION

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

END OF SECTION 061000

SECTION 06 16 00

SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wall sheathing.
2. Subflooring.
3. Underlayment.
4. Sheathing joint and penetration treatment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements.

1.3 INFORMATIONAL SUBMITTALS

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

1. Preservative-treated plywood.
2. Fire-retardant-treated plywood.
3. Foam-plastic sheathing.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS

A. Certified Wood: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship":

1. Plywood.
2. Oriented strand board.

B. Plywood: Either DOC PS 1 or DOC PS 2 unless otherwise indicated.

- C. Oriented Strand Board: DOC PS 2.

2.2 PRESERVATIVE-TREATED PLYWOOD

- A. Preservative Treatment by Pressure Process: AWWPA U1; Use Category UC2 for interior construction, Use Category UC3b for exterior construction.
- B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.
- C. Application: Treat items indicated on Drawings

2.3 FIRE-RETARDANT-TREATED PLYWOOD

- A. General: Where fire-retardant-treated materials are indicated, use materials complying with requirements in this article that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
 - 1. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 - 2. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 - 3. Design Value Adjustment Factors: Treated lumber plywood shall be tested according to ASTM D 5516 and design value adjustment factors shall be calculated according to ASTM D 6305. Span ratings after treatment shall be not less than span ratings specified.
- C. Kiln-dry material after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated plywood with appropriate classification marking of qualified testing agency.
- E. Application: Treat plywood indicated on Drawings.

2.4 WALL SHEATHING

- A. Plywood Wall Sheathing: Exposure 1, Structural I sheathing.
- B. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural I sheathing.

- C. Paper-Surfaced Gypsum Wall Sheathing: ASTM C 1396/C 1396M, gypsum sheathing; with water-resistant-treated core and with water-repellent paper bonded to core's face, back, and long edges.

- 1. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick.

- D. Glass-Mat Gypsum Wall Sheathing: ASTM C 1177/1177M.

- 1. Type and Thickness: Type X, 5/8 inch (15.9 mm) thick.

2.5 SUBFLOORING AND UNDERLAYMENT

- A. Plywood Subflooring: Exposure 1, Structural I single-floor panels or sheathing.

- B. Oriented-Strand-Board Subflooring: Exposure 1 Structural I sheathing.

2.6 FASTENERS

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

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

2.7 SHEATHING JOINT-AND-PENETRATION TREATMENT MATERIALS

- A. Sealant for Paper-Surfaced Gypsum Sheathing: Elastomeric, medium-modulus, neutral-curing silicone joint sealant compatible with joint substrates formed by gypsum sheathing and other materials, recommended by sheathing manufacturer for application indicated and complying with requirements for elastomeric sealants specified in Section 079200 "Joint Sealants."

2.8 MISCELLANEOUS MATERIALS

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

- 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
 - 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's "International Residential Code for One- and Two-Family Dwellings."
- D. Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Subflooring:
 - a. Glue and nail to wood framing.
 - b. Space panels 1/8 inch (3 mm) apart at edges and ends.
 - 2. Wall and Roof Sheathing:
 - a. Nail to wood framing.
 - b. Space panels 1/8 inch (3 mm) apart at edges and ends.

3.3 GYPSUM SHEATHING INSTALLATION

- A. Comply with GA-253 and with manufacturer's written instructions.
 - 1. Fasten gypsum sheathing to wood framing with nails or screws.

2. Install boards with a 3/8-inch (9.5-mm) gap where non-load-bearing construction abuts structural elements.
 3. Install boards with a 1/4-inch (6.4-mm) gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- B. Seal sheathing joints according to sheathing manufacturer's written instructions.
1. Apply elastomeric sealant to joints and fasteners and trowel flat. Apply sufficient amount of sealant to completely cover joints and fasteners after troweling. Seal other penetrations and openings.
 2. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing joints and apply and trowel silicone emulsion sealant to embed entire face of tape in sealant. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

END OF SECTION 061600

SECTION 06 62 00

SOLID SURFACE FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes solid surface fabrications as scheduled at end of section.

1.2 SUBMITTALS

- A. Division 01 - Submittal procedures.
- B. Shop Drawings: Indicate dimensions, materials, colors, finishes, fabrication details, field jointing, adjacent construction, methods of support, integration of plumbing and anchorages.
- C. Samples: Submit two samples of each pattern, 8 x 10 inch in size.

1.3 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit list of approved cleaning materials and procedures required; list of substances harmful to component materials. Include instructions for stain removal, surface and gloss restoration.

1.4 FIELD MEASUREMENTS

- A. Verify field measurements prior to fabrication.
- B. Verify field measurements are as indicated on shop drawings.

PART 2 PRODUCTS

2.1 SOLID SURFACE

- A. Acceptable Manufacturers and Products:
 - 1. Dupont; Corian.
 - 2. Formica; Surell.
 - 3. Wilson Art; Gibraltar.
- B. Colors and Patterns: As selected by the Architect from a full range of patterns.
- C. Thickness: ½” minimum.

2.2 FABRICATION

- A. Solid surface vanities and counter tops shall be fabricated with integral coved backsplashes.
- B. Seams shall be practically invisible.
- C. Vanities indicated shall have integral bowls.
- D. Shop assemble items for delivery to site in sizes easily handled and to ensure passage through building openings.

2.3 SHOP FINISHING

- A. As recommended by the Manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Provide anchoring devices for installation.
- B. Provide templates and rough-in measurements.

3.2 INSTALLATION

- A. Align work plumb and level.
- B. Rigidly anchor to substrate to prevent misalignment.
- C. Seal to adjacent construction in accordance with Section 07900.

3.3 ERECTION TOLERANCES

- A. Division 01 - Quality Requirements: Tolerances.
- B. Maximum Variation From Indicated Dimension: 1/8 inch (3 mm).
- C. Maximum Offset From Indicated Position: 1/8 inch (3 mm).

3.4 CLEANING

- A. Division 01 - Execution Requirements: Final cleaning.
- B. Clean and polish fabrication surfaces.

3.5 SCHEDULES

- A. Window sills.

END OF SECTION

SECTION 07 21 13

BOARD INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes rigid board insulation at wall construction, perimeter foundation wall and under concrete floor slabs and other locations indicated on the Drawings.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - 2. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics.
 - 3. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 4. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
- B. National Fire Protection Association:
 - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- C. Underwriters Laboratories Inc.:
 - 1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on product characteristics, performance criteria, limitations, and adhesives.
- C. Manufacturer's Installation Instructions: Submit special environmental conditions required for installation and installation techniques.
- D. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.

- B. Do not install adhesives when temperature or weather conditions are detrimental to successful installation.

1.5 COORDINATION

- A. Administrative Requirements: Coordination and project conditions.

PART 2 PRODUCTS

2.1 BOARD INSULATION

- A. Manufacturers:
 1. DiversiFoam Products - Extruded-Polystyrene Insulation.
 2. Dupont - Extruded-Polystyrene Insulation.
 3. Kingspan Insulation - Extruded-Polystyrene Insulation.
 4. UC Industries/Owens Corning - Extruded-Polystyrene Insulation.

2.2 COMPONENTS

- A. Perimeter and Under Slab Insulation: Extruded Polystyrene Insulation: ASTM C578 Type VI; cellular type, conforming to the following:
 1. Board Density: 1.8 lb/cu ft.
 2. Board Thickness: As indicated on the Drawings.
 3. Thermal Resistance: R of 5.0.
 4. Water Absorption: In accordance with ASTM D2842 0.3 percent by volume maximum.
 5. Compressive Strength: Minimum 40 psi.
 6. Board Edges: Square edges.
 7. Flame/Smoke Properties: 25/350 in accordance with ASTM E84, labeled by agency acceptable to authorities having jurisdictions.
- B. Wall Insulation: Extruded Polystyrene Insulation: ASTM C578 Type IV; cellular type, conforming to the following:
 1. Board Density: 1.60 lb/cu ft.
 2. Board Thickness: As indicated on the Drawings.
 3. Thermal Resistance: R of 5.0.
 4. Water Absorption: In accordance with ASTM D2842 0.3 percent by volume maximum.
 5. Compressive Strength: Minimum 25 psi.
 6. Board Edges: Square edges.
 7. Flame/Smoke Properties: 25/350 in accordance with ASTM E84, labeled by agency acceptable to authorities having jurisdictions.

2.3 ACCESSORIES

- A. Adhesive Type 1: Type recommended by insulation manufacturer for application.
- B. Tape: Polyethylene self-adhering type, mesh reinforced, 2 inch wide.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Verify substrate, adjacent materials, and insulation boards are dry and ready to receive insulation and adhesive.
- C. Verify substrate surface is flat, free of honeycomb, fins, irregularities, materials or substances affecting adhesive bond.

3.2 INSTALLATION - FOUNDATION PERIMETER

- A. Adhere a 24 inch wide strip of polyethylene sheet over construction control joints with double beads of Type 1 adhesive each side of joint.
 - 1. Tape seal joints.
 - 2. Extend sheet full height of joint.
- B. Install boards on foundation perimeter, horizontally.
 - 1. Place boards in method to maximize contact bedding.
 - 2. Stagger end joints.
 - 3. Butt edges and ends tight to adjacent board and to protrusions.
- C. Extend boards over control and expansion joints, unbonded to foundation 12 inches on one side of joint.
- D. Cut and fit insulation tight to protrusions or interruptions to insulation plane.

3.3 INSTALLATION - WALLS

- A. Secure impale fasteners to substrate at a frequency of 6 per insulation board, 1 per 10 sq. ft.
- B. Adhere a 3 inch wide strip of polyethylene sheet over control or expansion joint with double beads of adhesive each side of the joint between sheets. Extend full height of joint.
- C. Apply adhesive in three continuous beads per board length. Daub adhesive tight to protrusions to ensure continuity of vapor retarder and air seal.
- D. Attach wall insulation as recommended by the manufacturer.

3.4 INSTALLATION - UNDER CONCRETE SLABS

- A. Place insulation under slabs on grade after base for slab has been compacted.
- B. Cut and fit insulation tight to protrusions or interruptions to insulation plane.

- C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.5 INSTALLATION – EXTERIOR WALLS

- A. Apply adhesive as recommended by manufacturer.
- B. Place boards in method to maximize contact bedding, stagger end joints and butt edges and ends tight to adjacent board and to protrusions.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Division 01 - Execution Requirements: Protecting installed construction.
- B. Do not permit damage to insulation prior to covering.

END OF SECTION

SECTION 07 21 16

BATT INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes batt insulation and vapor retarder.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- B. National Fire Protection Association:
 - 1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- C. Underwriters Laboratories Inc.:
 - 1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on product characteristics, performance criteria, limitations.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

PART 2 PRODUCTS

2.1 BATT INSULATION

- A. Manufacturers:
 - 1. CertainTeed Insulation.
 - 2. Johns Manville.
 - 3. Knauf Fiber Glass.
 - 4. Owens Corning Fiberglas.

2.2 COMPONENTS

- A. Batt Insulation: ASTM C665; preformed glass fiber batt ; friction fit, conforming to the following:
 - 1. Thermal Resistance/Thickness: As indicated on the Drawings.
 - 2. Facing: Un-faced.
 - 3. Flame/Smoke Properties: 25/50 in accordance with ASTM E 84.
- B. Sheet Vapor Retarder: MemBrain as manufactured by Certainteed or Architect approved equal.
- C. Tape: Polyethylene self-adhering type, 2 inch minimum wide.
- D. Insulation Fasteners: Steel impale spindle and clip on flat metal base, self adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.
- E. Wire Mesh: Galvanized steel, hexagonal wire mesh as required.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Verify substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

- A. Install insulation and vapor retarder in accordance with insulation manufacturer's instructions.
- B. Install in exterior spaces indicated on the drawings without gaps or voids. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.
- E. Install sheet vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.
- F. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.
- G. Metal Framing: Place vapor retarder on warm side of insulation; lap and seal sheet retarder joints over member face.

- H. Extend vapor retarder tight to full perimeter of adjacent window and door frames and other items interrupting plane of membrane. Tape seal in place.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes firestopping and through-penetration protection system materials and accessories; firestopping tops of fire rated walls.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 3. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- B. Underwriters Laboratories Inc.:
 - 1. UL 263 - Fire Tests of Building Construction and Materials.
 - 2. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
 - 3. UL 1479 - Fire Tests of Through-Penetration Firestops.
 - 4. UL - Fire Resistance Directory.
- C. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.

1.3 DEFINITIONS

- A. Firestopping (Through-Penetration Protection System): Sealing or stuffing material or assembly placed in spaces between and penetrations through building materials to arrest movement of fire, smoke, heat, and hot gases through fire rated construction.

1.4 SYSTEM DESCRIPTION

- A. Firestopping Materials: ASTM E814 to achieve fire ratings as noted on Drawings for adjacent construction. Provide rated systems complying with the following requirements.
 - 1. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
 - 2. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by UL in "Fire Resistance Directory".
- B. Surface Burning: ASTM E84 with maximum flame spread / smoke developed rating of 25/450.

- C. Firestop interruptions to fire rated assemblies, materials, and components.

1.5 PERFORMANCE REQUIREMENTS

- A. Conform to applicable code for fire resistance ratings and surface burning characteristics.

1.6 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on product characteristics, performance and limitation criteria.
- C. Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- D. Manufacturer's Installation Instructions: Submit preparation and installation instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed applicable code requirements.
- F. Engineering Judgements: For conditions not covered by UL or WH listed designs, submit judgements by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Applicator: Company specializing in performing Work of this section with minimum three years documented experience , and approved by manufacturer.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.
- B. Do not apply materials when temperature of substrate material and ambient air is below 60 degrees F (15 degrees C).
- C. Maintain this minimum temperature before, during, and for minimum 3 days after installation of materials.
- D. Provide ventilation in areas to receive solvent cured materials.

PART 2 PRODUCTS

2.1 FIRESTOPPING

- A. Manufacturers:
 - 1. A/D Fire Protection Systems, Inc.
 - 2. Hilti Corp.
 - 3. 3M fire Protection Products.
 - 4. Nelson Firestop Products.
 - 5. Instant Firestop Mfg. Inc.
 - 6. Isolatek International.
 - 7. RectorSeal Corporation.
 - 8. Specified Technologies Inc.
 - 9. Tremco.
 - 10. United States Gypsum Co.

- B. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
 - 1. Silicone Firestopping Elastomeric Firestopping: Single or Multiple component silicone elastomeric compound and compatible silicone sealant.
 - 2. Foam Firestopping Compounds: Single or Multiple component foam compound.
 - 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
 - 4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
 - 5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
 - 6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
 - 7. Firestop Pillows: Formed mineral fiber pillows.

2.2 ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.

- B. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and other devices required to position and retain materials in place.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: Coordination and project conditions.

- B. Verify openings are ready to receive firestopping.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter affecting bond of firestopping material.
- B. Remove incompatible materials affecting bond.
- C. Install backing materials to arrest liquid material leakage.

3.3 APPLICATION

- A. Install material at fire rated construction perimeters and openings containing penetrating sleeves, piping, ductwork, conduit and other items, requiring firestopping.
- B. Apply primer where recommended by manufacturer for type of firestopping material and substrate involved, and as required for compliance with required fire ratings.
- C. Apply firestopping material in sufficient thickness to achieve required fire and smoke rating.
- D. Compress fibered material to maximum 40 percent of its uncompressed size.
- E. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- F. Place intumescent coating in sufficient coats to achieve rating required.

3.4 FIELD QUALITY CONTROL

- A. Inspect installed firestopping for compliance with specifications and submitted schedule.

3.5 CLEANING

- A. Division 01 - Execution Requirements: Final cleaning.
- B. Clean adjacent surfaces of firestopping materials.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Division 01 - Execution Requirements: Protecting installed construction.
- B. Protect adjacent surfaces from damage by material installation.

END OF SECTION

SECTION 07 92 00

JOINT SEALERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes sealants and joint backing, and accessories.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C834 - Standard Specification for Latex Sealants.
 - 2. ASTM C920 - Standard Specification for Elastomeric Joint Sealants.
 - 3. ASTM C1193 - Standard Guide for Use of Joint Sealants.

1.3 SUBMITTALS

- A. Division 1 - Submittal Procedures: Submittal procedures.
- B. Products Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.
- C. Samples: Submit two samples illustrating sealant colors for selection.
- D. Manufacturer's Installation Instructions: Submit special procedures, surface preparation, and perimeter conditions requiring special attention.
- E. Warranty: Include coverage for installed sealants and accessories failing to achieve watertight seal, exhibit loss of adhesion or cohesion, and sealants which do not cure.

1.4 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Applicator: Company specializing in performing Work of this section with minimum five years documented experience , and approved by manufacturer.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Division 1 - Products Requirements.
- B. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.6 COORDINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work with sections referencing this section.

PART 2 PRODUCTS

2.1 JOINT SEALERS

- A. Products Description:
 - 1. High Performance General Purpose Exterior (Nontraffic) Sealant Silicone.
 - a. Color: Colors as selected by the Architect.
 - b. Acceptable Manufacturers/Products:
 - 1) Dow Corning; 790.
 - 2) GE Silicones; Silpruf
 - 3) GE Silicones: UltraPruf SCS2300.
 - 4) Pecora; 864.
 - 5) Pecora; 890.
 - 6) BASF; Omniseal.
 - 7) Tremco; Spectrem 1.
 - 8) SIKA
 - 2. High Performance General Purpose Exterior (Nontraffic) Sealant Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; multi-component.
 - a. Color: Colors as selected by the Architect.
 - b. Acceptable Manufacturers/Products:
 - 1) Pecora; Dynatrol II.
 - 2) Sika; Sikaflex – 2c NS EZ
 - 3) Tremco; Dymeric 511.
 - 4) Bostik; Chem-Calk 2641.
 - 5) BASF; NP 2.
 - 3. High Performance General Purpose Exterior (Nontraffic) Sealant Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single-component.
 - a. Color: Colors as selected by the Architect.
 - b. Acceptable Manufacturers/Products:
 - 1) Sika; Sikflex – 1a.
 - 2) BASF; NP 1.
 - 3) Bostik; Chem-Calk 900.
 - 4) Mameco; Vulkem 921.
 - 5) Pecora; Dynatrol I.
 - 6) Tremco; DyMonic.
 - 4. General Purpose Traffic Bearing Sealant Polyurethane; ASTM C920, Grade P, Class 25, Use T; multi-component.
 - a. Color: Colors as selected by the Architect.
 - b. Acceptable Manufacturers/Products:
 - 1) Bostik; Chem-Calk 550.
 - 2) W.R. Meadows; Pourthane.
 - 3) Pecora; NR-200 Urexpan.

- 4) Pecora; NR-300 Urexpan, Type M.
 - 5) Sika; Sikaflex – 2c SL.
 - 6) BASF; SL 2.
 - 7) Tremco; THC-900.
 - 8) Tremco; THC-901.
5. General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, single component, paintable.
- a. Color: Colors as selected by the Architect.
 - b. Acceptable Manufacturers/Products:
 - 1) Bostik; Chem-Calk 600.
 - 2) Pecora; AC-20.
 - 3) BASF; Sonolac.
 - 4) Tremco; Tremflex 834.
6. Plumbing Fixture Sealant: Silicone; ASTM C920, Uses M and A; single component, mildew resistant.
- a. Color: White.
 - b. Acceptable Manufacturers/Products:
 - 1) Dow Corning; 786 Mildew Resistant.
 - 2) GE Silicones; Sanitary 1700.
 - 3) Pecora; 898 Silicone Sanitary Sealant.
 - 4) Tremco; Tremsil 600 white.
 - 5) SIKA

2.2 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM C 330; oversized 30 to 50 percent larger than joint width.
 1. Type: C: Closed-cell material with surface skin.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Administrative Requirements: Coordination and project conditions.
- B. Verify substrate surfaces and joint openings are ready to receive work.
- C. Verify joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter impairing adhesion of sealant.
- B. Clean and prime joints.
- C. Perform preparation in accordance with ASTM C1193.
- D. Protect elements surrounding Work of this section from damage or disfiguration.

3.3 INSTALLATION

- A. Perform installation in accordance with ASTM C1193.
- B. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.
- C. Install bond breaker where joint backing is not used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- F. Tool joints concave.
- G. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.

3.4 CLEANING

- A. Division 01 - Execution Requirements: Final cleaning.
- B. Clean adjacent soiled surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Division 01 - Execution Requirements: Protecting installed construction.
- B. Protect sealants until cured.

3.6 SCHEDULE

- A. Exterior Sealants:
 - 1. Door and window frame perimeters: silicone.
 - 2. All joints and openings with dissimilar materials: silicone.
 - 3. Expansion Joints in a horizontal plane: polyurethane.
 - 4. Sheet metal joints, flashing, reglets: silicone.
 - 5. Metal curtain wall joints: silicone.

6. Plaza sealants: self-leveling polyurethane.

B. Interior Painted Caulks:

1. Door and window frame perimeters: acrylic latex.

C. Interior Non-Painted Caulks:

1. Door and window frame perimeters: acrylic latex.

2. All joints and openings with dissimilar materials: acrylic latex.

3. Vertical expansion joints and masonry control joints: silicone.

4. Horizontal expansion joints: polyurethane.

5. Sheet metal joints: polyurethane.

6. Plumbing fixture perimeters: mildew resistant silicone.

7. Exposed concrete control joints: self-leveling polyurethane.

8. Counter tops: silicone.

END OF SECTION

SECTION 08 11 13

STEEL DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes non-rated, fire rated and thermally insulated steel doors.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A591/A591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
 - 2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. ASTM C1363 - Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
 - 4. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 5. ASTM E413 - Standard Classification for Rating Sound Insulation.
- B. National Fire Protection Association:
 - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
 - 2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
 - 3. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- C. Underwriters Laboratories Inc.:
 - 1. UL 10B - Fire Tests of Door Assemblies.
 - 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
 - 3. UL 723 - Tests for Surface Burning Characteristics of Building Materials.
- D. Uniform Building Code:
 - 1. UBC Standard 7-2 - Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, louvers, and finishes.
- C. Product Data: Submit door configurations, location of cut-outs for hardware reinforcement.
- D. Manufacturer's Installation Instructions: Submit special installation instructions.
- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of HMMA 890 - Hollow Metal Manual, including HMMA 802, HMMA 810, HMMA 830, HMMA 840, and HMMA 850.
- B. Fire Rated Door and Panel Construction: Conform to one of the following:
 - 1. NFPA 252; with neutral pressure level at 40 inches (1015 mm) maximum above sill at 5 minutes into test.
 - 2. UL 10C.
 - 3. 20-Minute Fire Rated Corridor [and Smoke Barrier] Doors: Fire tested without hose stream test.
- C. Fire Rated Stair Doors: Rate of rise of 450 degrees F (250 degrees C) across door thickness.
- D. Installed Fire Rated Door [and Panel] Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.
- E. Smoke and Draft Control Doors: Tested in accordance with UL 1784.
 - 1. Air Leakage: Maximum 3.0 cfm/sf (0.0154 cu m/s/sq m) of door opening with 0.10 inch water gage (24.9 Pa) pressure differential.
- F. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
 - 1. Indicate temperature rise rating for stair doors.
 - 2. Attach smoke label to smoke and draft control doors.
- G. Surface Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.
- H. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on site to permit ventilation.

1.7 COORDINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work with door opening construction, door frame and door hardware installation.

- C. Sequence installation to accommodate required door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STEEL DOORS

- A. Manufacturers:
 - 1. Ceco Door Products.
 - 2. Curries.
 - 3. Steelcraft.
 - 4. Habersham Metal Products.
 - 5. Republic Builders Products.
 - 6. Metal Products, Inc. (MPI).
- B. Product Description:
 - 1. Design:
 - a. Exterior Doors (Thermally Isolated): SDI-100 Grade II Model 1. Minimum 16 gage galvanized steel sheet faces.
 - b. Interior Doors (Non-rated): SDI-100 Grade II model 1. Minimum 18 gage sheet steel faces.
 - c. Interior Doors (Fire Rated): SDI-100 Grade II model 1. Minimum 18 gage sheet steel faces.
 - 2. Type:
 - a. Full flush with continuously welded edge seams.
 - 3. Thickness: 1-3/4 inch (45 mm).

2.2 COMPONENTS

- A. Face: Steel, galvanized sheet in accordance with ASTM A653/A653M electrolytic zinc-coated in accordance with ASTM A591/A591M, manufactured and fabricated in accordance with HMMA 802 and 810.
 - 1. Exterior Doors: 0.053 inch or 16 gage (1.3 mm).
 - 2. Interior Doors: 0.042 inch or 18 gage (1 mm).
- B. Core: Vertical steel stiffeners with foam at exterior doors.
- C. Thermal Insulated Door: Total insulation R-Value of 2.4, measured in accordance with ASTM C1363.

2.3 ACCESSORIES

- A. Removable Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.
- B. Primer: Zinc chromate type.

2.4 FABRICATION

- A. Astragals for Double Doors: Steel, Z shaped, specifically for double doors.
- B. Fabricate doors with hardware reinforcement welded in place.
- C. Attach fire rated label to each fire rated door unit.
- D. Configure exterior doors to receive recessed weatherstripping.

2.5 SHOP FINISHING

- A. Exterior Units: ASTM A653/A653M G90.
- B. Interior Units: ASTM A653/A653M G60.
- C. Primer: Air dried.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install doors in accordance with HMMA 840.
- B. Coordinate installation of glass and glazing.
- C. Install door louvers, plumb and level.
- D. Coordinate installation of doors with installation of frames and hardware, and glass.

3.3 ERECTION TOLERANCES

- A. Division 01 - Quality Requirements: Tolerances.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.4 ADJUSTING

- A. Division 01 - Execution Requirements: Testing, adjusting, and balancing.
- B. Adjust door for smooth and balanced door movement.

END OF SECTION

SECTION 08 12 13

STEEL FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes non-rated and fire rated steel frames.
 - 1. Provide frames for interior glazed lights.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM A591/A591M - Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Mass Applications.
 - 2. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- B. Hollow Metal Manufacturers Association:
 - 1. HMMA 802 - Manufacturing of Hollow Metal Doors and Frames.
 - 2. HMMA 820 - Hollow Metal Frames.
 - 3. HMMA 830 - Hardware Preparation and Locations for Hollow Metal Doors and Frames.
 - 4. HMMA 840 - Installation and Storage of Hollow Metal Doors and Frames.
 - 5. HMMA 850 - Fire Rated Hollow Metal Doors & Frames.
 - 6. HMMA 890 - Technical Summary of Hollow Metal by HMMA.
- C. National Fire Protection Association:
 - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
 - 2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- D. Underwriters Laboratories Inc.:
 - 1. UL 10B - Fire Tests of Door Assemblies.
 - 2. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
- E. Uniform Building Code:
 - 1. UBC Standard 7-2 - Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacings, location of cut-outs for hardware, and finish.
- C. Product Data: Submit frame configuration and finishes.
- D. Manufacturer's Installation Instructions: Submit special installation instructions.

- E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Conform to requirements of HMMA 890 - Hollow Metal Manual, including HMMA 802, HMMA 820, HMMA 830, HMMA 840, and HMMA 850.
- B. Fire Rated Frame Construction: Conform to one of the following:
 - 1. NFPA 252; with neutral pressure level at 40 inches (1015 mm) maximum above sill at 5 minutes into test.
 - 2. UL 10C.
 - 3. 20-Minute Fire Rated Corridor and Smoke Barrier Frames: Fire tested without hose stream test.
- C. Fire Rated Frame Construction: Conform to UBC Standard 7-2.
- D. Installed Fire Rated Frame Assembly: Conform to NFPA 80 for fire rated class same as fire door.
- E. Smoke and Draft Control Door Frames: Tested in accordance with UL 1784.
 - 1. Air Leakage: Maximum 3.0 cfm/sf (0.0154 cu m/s/sq m) of door opening with 0.10 inch water gage (24.9 Pa) pressure differential.
- F. Attach label from agency approved by authority having jurisdiction to identify each fire rated door frame.
 - 1. Attach smoke label to smoke and draft control door frames.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Accept frames on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on-site to permit ventilation.

1.7 COORDINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work with frame opening construction, door and hardware installation.
- C. Sequence installation to accommodate required door hardware electric wire connections.

PART 2 PRODUCTS

2.1 STEEL FRAMES

- A. Manufacturers:
 - 1. Ceco Door Products.
 - 2. Curries.
 - 3. Steelcraft.
 - 4. Habersham Metal Products.
 - 5. Republic Builders Products.
 - 6. Metal Products Inc. (MPI).
- B. Product Description: Shop fabricated steel frames, fire rated and non-rated types.

2.2 COMPONENTS

- A. Steel: Galvanized sheet in accordance with ASTM A653/A653M; G90.
 - 1. Interior Frames: 16 gage/0.053 inch thick material, base metal thickness.

2.3 ACCESSORIES

- A. Silencers: Resilient rubber fitted into drilled hole.
- B. Removable Stops: Rolled steel channel shape, mitered corners; prepared for countersink style tamper proof screws.
- C. Epoxy Coating.
- D. Primer: Zinc chromate type.

2.4 FABRICATION

- A. Fabricate frames as welded unit.
- B. Mullions for Double Doors: Fixed type, of same profiles as jambs.
- C. Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.
- D. Fabricate frames with hardware reinforcement plates welded in place. Furnish mortar guard boxes.
- E. Attach fire rated label to each fire rated frame.
- F. Reinforce frames wider than 48 inches (1 200 mm) with roll formed steel channels fitted tightly into frame head, flush with top.
- G. Prepare frames for silencers. Furnish three single silencers for single doors [and mullions of double doors] on strike side. Furnish two single silencers on frame head at double doors without mullions.
- H. Fabricate frames to suit masonry wall coursing with 4 or 2 inch head member.

2.5 SHOP FINISHING

- A. Interior Units: ASTM A653/A653M G90.
- B. Primer: Air dried.
- C. Prior to shipment, inside surfaces of all masonry frames shall be coated with epoxy, minimum 5 mils DFT.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install frames in accordance with HMMA 840.
- B. Coordinate with masonry, gypsum board and concrete wall construction for anchor placement.
- C. Coordinate installation of glass and glazing specified in Section 08800.
- D. Coordinate installation of frames with installation of hardware specified in Section 08710 and doors.
- E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

- A. Division 01 - Quality Requirements: Tolerances.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

END OF SECTION

SECTION 08 14 16

FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes flush wood doors; fire rated and non-rated.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A135.4 - Basic Hardboard.
- B. ASTM International:
 - 1. ASTM E413 - Standard Classification for Rating Sound Insulation.
- C. Architectural Woodwork Institute:
 - 1. AWI - Quality Standards Illustrated.
- D. Forest Stewardship Council:
 - 1. FSC Guidelines - Forest Stewardship Council Guidelines.
- E. Hardwood Plywood and Veneer Association:
 - 1. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood.
- F. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.
- G. National Electrical Manufacturers Association:
 - 1. NEMA LD 3 - High Pressure Decorative Laminates.
- H. National Fire Protection Association:
 - 1. NFPA 80 - Standard for Fire Doors, Fire Windows.
 - 2. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.
- I. South Coast Air Quality Management District:
 - 1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.
- J. Underwriters Laboratories Inc.:
 - 1. UL - Building Materials Directory.
 - 2. UL 10B - Fire Tests of Door Assemblies.
 - 3. UL 10C - Positive Pressure Fire Tests of Door Assemblies.
 - 4. UL 1784 - Air Leakage Tests of Door Assemblies.
- K. Uniform Building Code:
 - 1. UBC Standard 7-2 - Fire Tests of Door Assemblies.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing.
- C. Product Data: Submit information on door core materials and construction, and on veneer species, type and characteristics.
- D. Samples:
 - 1. Submit two samples of door construction, 12 x 12 inch in size cut from top or bottom corner of door.
 - 2. Submit two samples of door veneer, 8 x 10 inch in size illustrating wood grain, stain color, and sheen.
- E. Manufacturer's Installation Instructions: Submit special installation instructions.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with AWI Quality Standard Section 1300, Premium grade.
- B. Finish doors in accordance with AWI Quality Standard Section 1500.
- C. Fire Rated Door and Panel Construction: Conform to one of the following:
 - 1. NFPA 252; with neutral pressure level at 40 inches (1015 mm) maximum above sill at 5 minutes into test.
 - 2. UL 10C.
 - 3. 20-Minute Fire Rated Corridor and Smoke Barrier Doors: Fire tested without hose stream test.
- D. Installed Fire Rated Door and Panel Assembly: Conform to NFPA 80 for fire rated class as indicated on Drawings.
- E. Smoke and Draft Control Doors: Tested in accordance with UL 1784.
 - 1. Air Leakage: Maximum 3.0 cfm/sf (0.0154 cu m/s/sq m) of door opening with 0.10 inch water gage (24.9 Pa) pressure differential.
- F. Attach label from agency approved by authority having jurisdiction to identify each fire rated door.
 - 1. Indicate temperature rise rating for stair doors.
 - 2. Attach smoke label to smoke and draft control doors.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years [documented] experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.

- B. Accept doors on site in manufacturer's packaging. Inspect for damage.

1.7 COORDINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Coordinate Work with door opening construction, door frame and door hardware installation.

1.8 WARRANTY

- A. Division 01 - Execution Requirements: Product warranties and product bonds.
- B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.
- C. Furnish manufacturer's "Life of Installation" warranty for interior doors.

PART 2 PRODUCTS

2.1 FLUSH WOOD DOORS

- A. Manufacturers:
 - 1. Masonite
 - 2. Eggers Industries.
 - 3. Oshkosh Door Company.
- B. Product Description: Solid core flush wood doors; wood veneer facing material; fire rated and non-rated types; flush design; factory pre-fit; shop finished wood doors.
 - 1. Flush Interior Doors: 1-3/4 inches thick; solid core, five or seven ply construction, fire rated as indicated on Drawings.
 - 2. Transom Panels: To match door, face veneer to end match, fire rated, as indicated on Drawings.

2.2 COMPONENTS

- A. Solid Core, Non-Rated: AWI Section 1300, Type PC - Particleboard.
- B. Solid Core, Fire Rated: AWI Section 1300, Type FD 1-1/2; Category A for positive pressure fire test.
- C. Interior Veneer Facing: AWI Premium quality wood, sliced to match existing with balanced match, book end matched grain, end matched transoms, for transparent finish. Pair match multiple door leaves in single opening.
 - 1. Wood: Plain sliced red oak.

2.3 ACCESSORIES

- A. Glazing Stops: Wood with metal clips for rated doors channel shape, mitered corners; prepared for countersink style tamper proof screws.

2.4 FABRICATION

- A. Fabricate doors in accordance with AWI Quality Standards requirements.
- B. Astragals for Fire Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge, specifically for double doors.
- C. Furnish lock blocks at lock edge and top of door for closer for hardware reinforcement.
- D. Vertical Exposed Edge of Stiles: Of same species as veneer facing.
- E. Fit door edge trim to edge of stiles after applying veneer facing.
- F. Bond edge banding to cores.
- G. At exterior doors, furnish aluminum flashing at top and bottom rail and sill of glazed openings for full thickness and width of door.
- H. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Furnish solid blocking for through bolted hardware.
- I. Factory fit doors for frame opening dimensions identified on shop drawings.
- J. Cut and configure exterior door edge to receive recessed weather stripping devices.
- K. Provide edge clearances in accordance with AWI 1300.

2.5 SHOP FINISHING

- A. Finish work in accordance with AWI - Section 1500 Factory Finishing; Premium Quality; Stained Transparent Type:
 - 1. Conversion Varnish.
 - 2. Catalyzed Polyurethane.
 - 3. UV Cured Epoxy, Polyester, Urethane.
- B. Factory finish doors in stain color as selected by the Architect.
- C. Seal door top edge with sealer to match door facing.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify 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.

3.2 INSTALLATION

- A. Install doors in accordance with AWI Quality Standards requirements.
- B. Trim non-rated door width by cutting equally on both jamb edges.
- C. Trim door height by cutting bottom edges to maximum of 3/4 inch (19 mm).
 - 1. Trim fire door height at bottom edge only, in accordance with fire rating requirements.
- D. Machine cut doors for hardware installation.
- E. Coordinate installation of doors with installation of frames and hardware.
- F. Install door louvers plumb and level.
- G. Coordinate installation of glass and glazing specified in Section 08800.

3.3 INSTALLATION TOLERANCES

- A. Division 01 - Quality Requirements: Tolerances.
- B. Conform to AWI requirements for fit and clearance tolerances.
- C. Maximum Diagonal Distortion (Warp): 1/8 inch (3 mm) measured with straight edge or taut string, corner to corner, over imaginary 36 x 84 inches (915 X 2 130 mm) surface area.
- D. Maximum Vertical Distortion (Bow): 1/8 inch (3 mm) measured with straight edge or taut string, top to bottom, over imaginary 36 x 84 inches (915 X 2 130 mm) surface area.
- E. Maximum Width Distortion (Cup): 1/8 inch (3 mm) measured with straight edge or taut string, edge to edge, over imaginary 36 x 84 inches (915 X 2 130 mm) surface area.

3.4 ADJUSTING

- A. Division 01 - Execution Requirements: Testing, adjusting, and balancing.
- B. Adjust door for smooth and balanced door movement.
- C. Adjust closer for full closure.

END OF SECTION

SECTION 08 3613 - SECTIONAL OVERHEAD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Insulated Sectional Overhead Doors.
- B. Electric Motorized Operating Hardware, tracks, and support.

1.2 REFERENCES

- A. [ANSI/DASMA 102](#) - American National Standard Specifications for Sectional Overhead Type Doors.

1.3 DESIGN / PERFORMANCE REQUIREMENTS

- A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
- B. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.4 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.
- D. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- E. Operation and Maintenance Data.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Protect materials from exposure to moisture until ready for installation.
- C. Store materials in a dry, ventilated weathertight location.

1.7 PROJECT CONDITIONS

- A. Pre-Installation Conference: Convene a pre-installation conference just prior to commencement of field operations, to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.

B.

1.8 WARRANTY

- A. Warranty: Manufacturer's limited door and operators System warranty for 10 year against delamination of polyurethane foam from steel face and all other components for 3 years or 20,000 cycles, whichever comes first.

B.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Overhead Door Corp.,
- B. Cookson
- C. Cornell

2.2 INSULATED SECTIONAL OVERHEAD DOORS

- A. Insulated Steel Sectional Overhead Doors: 591 Series Thermacore Insulated Steel Doors by Overhead Door Corporation. Units shall have the following characteristics:

1. Door Assembly: Metal/foam/metal sandwich panel construction, with PVC thermal break and weather-tight ship-lap design meeting joints.
 - a. Panel Thickness: 2 inches (51 mm).
 - b. Exterior Surface: Ribbed, textured.
 - c. Exterior Steel: .015 inch (.38 mm), hot-dipped galvanized.
 - 1) Glazing in Steel Panels: 1/2 inch (12.5 mm) Clear Lexan Insulated glazing.
 - d. End Stiles: 16 gauge with thermal break.
 - e. Spring Counterbalance: Sized to weight of the door, with a helically wound, oil tempered torsion spring mounted on a steel shaft; cable drum of diecast aluminum with high strength galvanized aircraft cable. Sized with a minimum 7 to 1 safety factor.
 - 1) Standard cycle spring: 10,000 cycles.
 - f. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 - g. Thermal Values: R-value of 17.50; U-value of 0.057.
 - h. Air Infiltration: 0.08 cfm at 15 mph; 0.08 cfm at 25 mph.
2. Finish and Color:
 - a. Two coat baked-on polyester:
 - 1) Interior color, white.
 - 2) Exterior color, as selected by the Architect.
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: Galvanized steel hinges and fixtures. Ball bearing rollers with hardened steel races.
5. Lock:
 - a. Keyed lock.
6. Weatherstripping:
 - a. EPDM bulb-type strip at bottom section.
 - b. Flexible Jamb seals.
 - c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
 - a. Size:
 - 1) 3 inch (76 mm).
 - b. Type:
 - 1) High lift.
8. Electric Motorized Operation: Provide 3 horse power RHX Heavy duty commercial operators with remote openers and push button openers for each door.
 - 1)

PART 3 EXECUTION

SECTIONAL OVERHEAD DOORS

3.1 EXAMINATION

- A. Do not begin installation until openings have been properly prepared.
- B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- C. Verify electric power is available and of correct characteristics.
- D. If preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.
- B.
- C. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.
- D. Anchor assembly to wall construction and building framing without distortion or stress.
- E. Securely brace door tracks suspended from structure. Secure tracks to structural members only.
- F. Fit and align door assembly including hardware.

3.4 CLEANING AND ADJUSTING

- A. Adjust door assembly to smooth operation and in full contact with weatherstripping.
- B. Clean doors, frames and glass.
- C. Remove temporary labels and visible markings.

3.5 PROTECTION

- A. Do not permit construction traffic through overhead door openings after adjustment and cleaning.
- B. Protect installed products until completion of project.

- C. Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

END OF SECTION 08 3613

SECTION 08 41 13

ALUMINUM-FRAMED ENTRANCES, STOREFRONTS AND WINDOWS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes aluminum-framed storefronts including doors and frames.
- B. Section includes operable awning and sliding windows.

1.2 REFERENCES

- A. Aluminum Association:
 - 1. AA ADM 1 - Aluminum Design Manual.
- B. American Architectural Manufacturers Association:
 - 1. AAMA 501 - Methods of Test for Exterior Walls.
 - 2. AAMA 502 - Voluntary Specification for Field Testing of Windows and Sliding Glass Doors.
 - 3. AAMA 503 - Voluntary Specification for Field Testing of Metal Storefronts. Curtain Wall and Sloped Glazing Systems.
 - 4. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
 - 5. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
 - 6. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - 7. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
 - 8. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
 - 9. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site.
 - 10. AAMA MCWM-1 - Metal Curtain Wall Manual.
 - 11. AAMA SFM-1 - Aluminum Store Front and Entrance Manual.
- C. American Society of Civil Engineers:
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- D. ASTM International:
 - 1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
 - 2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 4. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

5. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric).
 6. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 7. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
 8. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 9. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 10. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
 11. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
 12. ASTM E547 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 13. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Difference.
 14. ASTM E1886 - Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
 15. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
- E. Green Seal:
1. GC-03 - Anti-Corrosive Paints.
- F. National Fenestration Rating Council Incorporated:
1. NFRC 100 - Procedures for Determining Fenestration Product U-Factors.
- G. National Fire Protection Association:
1. NFPA 255 - Standard Method of Test of Surface Burning Characteristics of Building Materials.
- H. SSPC: The Society for Protective Coatings:
1. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
 2. SSPC Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.
- I. Underwriters Laboratories Inc.:
1. UL 723 - Tests for Surface Burning Characteristics of Building Materials.

1.3 PERFORMANCE REQUIREMENTS

- A. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, including building corners.
1. As calculated in accordance with applicable code, as tested in accordance with ASTM E330.
- B. Deflection: Limit mullion deflection to 1/175 for spans under 13'-6" (4.115 m) and 1/240 plus 1/4 inch (6.35 mm) for spans over 13'-6" (4.115 m) of span; with full recovery of glazing materials.

- C. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and peripheral construction, dynamic loading and release of loads, deflection of structural support framing.
- D. Air Infiltration: Limit air leakage through assembly to 0.06 cfm/min/sq ft (0.0003 cu m/s/sq m) of wall area, measured at reference differential pressure across assembly of 1.57 psf (75 Pa) as measured in accordance with AAMA 501.
- E. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
- F. Water Leakage: None, when measured in accordance with AAMA 501 with test pressure difference of 20 percent of design pressure, with minimum differential of 2.86 lbf/sq ft (136.85 N/sq m) and maximum of 12.00 lbf/sq ft (574.2 N/sq m).
- G. Thermal Transmittance of Assembly (Excluding Entrances): Maximum U Value of 0.69 Btu/sq ft per hour per deg F when measured in accordance with AAMA 1503.
- H. Expansion / Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over 12 hour period without causing detrimental effect to system components and anchorage.
- I. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

1.4 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.
- C. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, [door hardware,] and internal drainage details.
- D. Samples: Submit two samples 12 x 12 inches (300 x 300 mm) in size illustrating finished aluminum surface, glass units, glazing materials.
- E. Design Data: Indicate framing member structural and physical characteristics, calculations, dimensional limitations.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with AAMA SFM-1 and AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Surface Burning Characteristics:
 - 1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84, NFPA 255 and UL 723.
- C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.6 QUALIFICATIONS

- A. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum three years documented experience and with service facilities within 100 miles of Project.
- B. Design structural support framing components under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.7 PRE-INSTALLATION MEETINGS

- A. Division 01 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.8 DELIVERY, STORAGE, AND PROTECTION

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Protect finished aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.9 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.
- B. Do not install sealants nor glazing materials when ambient temperature is less than 40 degrees F (5 degrees C) during and 48 hours after installation.

PART 2 PRODUCTS

2.1 ALUMINUM-FRAMED STOREFRONTS AND FIXED WINDOWS

- A. Manufacturers:
 - 1. Kawneer Co., Inc.
 - 2. Traco.
 - 3. Vistawall Architectural Products.
 - 4. YKK AP America.
 - 5. Cross Aluminum
 - 6. Special-Lite
 - 7. Tubelite
- B. Product Description:
 - 1. Aluminum Frame: Thermally broken; flush glazing stops; drainage holes; internal weep drainage system. Frames for interior glazing need not to be thermally broken.
 - 2. Mullions: Profile of extruded aluminum with internal reinforcement of aluminum or shaped steel structural section.
 - 3. Doors: Aluminum framed glass doors; 1-3/4 inches thick, square glazing stops.
 - 4. Awning Windows: Kawneer Glassvent windows.
 - 5. Sliding Windows: Kawneer 8400 TL.

2.2 COMPONENTS

- A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

- B. Sheet Aluminum: ASTM B209, 5005 alloy, H15 or H34 temper.
- C. Sheet Steel: ASTM A653/A653M; galvanized to minimum G90.
- D. Steel Sections: ASTM A36/A36M; shaped to suit mullion sections, galvanized.
- E. Glass: Specified in Section 08 80 00.
- F. Glazing Materials: Storefront manufacturer's standard types to suit application and to achieve weather, moisture, and air infiltration requirements.
- G. Fasteners: Stainless steel.

2.3 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- C. Prepare components to receive anchor devices. Fabricate anchors.
- D. Arrange fasteners and attachments to conceal from view.
- E. Prepare components with internal reinforcement for door hardware.
- F. Reinforce framing members for imposed loads.

2.4 SHOP FINISHING

- A. Clear Anodized Aluminum Surfaces: AAMA 611, non-specular as fabricated mechanical finish, medium matte chemical finish, and Architectural Class I 0.7 mils (0.018 mm) anodized coating.
- B. Concealed Steel Items: Galvanized to ASTM A123/A123M; minimum 1.2 oz/sq ft coating thickness; galvanize after fabrication.
- C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar metals.
- D. Touch-Up Primer for Galvanized Steel Surfaces: SSPC Paint 20 zinc rich.
- E. Extent of Finish:
 1. Apply factory coating to surfaces exposed at completed assemblies.
 2. Apply finish to surfaces cut during fabrication so no natural aluminum is visible in completed assemblies, including joint edges.
 3. Apply touch-up materials recommended by coating manufacturer for field application to cut ends and minor damage to factory applied finish.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.

- B. Verify dimensions, tolerances, and method of attachment with other Work.
- C. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

3.2 INSTALLATION

- A. Install wall system in accordance with AAMA MCWM-1 - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent Work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor retarder materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install integral flashings and integral joint sealers.
- J. Coordinate installation of glass with Section 08 80 00; separate glass from metal surfaces.
- K. Coordinate installation of perimeter sealants with Section 07 92 00.

3.3 ERECTION TOLERANCES

- A. Division 01 - Quality Requirements Tolerances.
- B. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft , whichever is less.
- C. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 ADJUSTING

- A. Division 01 - Execution Requirement: Testing, adjusting and balancing.

3.5 CLEANING

- A. Division 01 - Execution Requirements: Final cleaning.
- B. Remove protective material from pre-finished aluminum surfaces.
- C. Wash down surfaces with solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- D. Remove excess sealant by method acceptable to sealant manufacturer.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Division 01 - Execution Requirements: Protecting installed construction.
- B. Protect finished Work from damage.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Mechanical and electrified door hardware
2. Electronic access control system components

1.02 REFERENCES

A. UL LLC

1. UL 10B - Fire Test of Door Assemblies
2. UL 10C - Positive Pressure Test of Fire Door Assemblies
3. UL 1784 - Air Leakage Tests of Door Assemblies
4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute

1. Sequence and Format for the Hardware Schedule
2. Recommended Locations for Builders Hardware
3. Keying Systems and Nomenclature
4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute

1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.03 ALLOWANCE

- A. Permanent cores, keys, and keying: \$2,500.

1.04 SUBMITTALS

A. General:

1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
 - a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
 - b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:

1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
 - a. Wiring Diagrams: For power, signal, and control wiring and including:
 - 1) Details of interface of electrified door hardware and building safety and security systems.
 - 2) Schematic diagram of systems that interface with electrified door hardware.
 - 3) Point-to-point wiring.
 - 4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
 - a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule:
 - a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
 - b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
 - c. Indicate complete designations of each item required for each opening, include:
 - 1) Door Index: door number, heading number, and Architect's hardware set number.
 - 2) Quantity, type, style, function, size, and finish of each hardware item.
 - 3) Name and manufacturer of each item.
 - 4) Fastenings and other pertinent information.
 - 5) Location of each hardware set cross-referenced to indications on Drawings.
 - 6) Explanation of all abbreviations, symbols, and codes contained in schedule.
 - 7) Mounting locations for hardware.
 - 8) Door and frame sizes and materials.
 - 9) Degree of door swing and handing.
 - 10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.
5. Key Schedule:

- a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
- b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
- c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
- d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
- e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
- f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
 - a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
 - b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
 - a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
 - b. Catalog pages for each product.
 - c. Final approved hardware schedule edited to reflect conditions as installed.
 - d. Final keying schedule
 - e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
 - f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
 - a. Fire door assemblies, in compliance with NFPA 80.
 - b. Required egress door assemblies, in compliance with NFPA 101.

1.05 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
 - a. For door hardware: DHI certified AHC or DHC.
 - b. Can provide installation and technical data to Architect and other related subcontractors.
 - c. Can inspect and verify components are in working order upon completion of installation.
 - d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:

1. Fire-Rated Door Openings:
 - a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
 - b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
2. Smoke and Draft Control Door Assemblies:
 - a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
 - b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
3. Electrified Door Hardware
 - a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
4. Accessibility Requirements:
 - a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings

1. Keying Conference
 - a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:

- 1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2) Preliminary key system schematic diagram.
 - 3) Requirements for key control system.
 - 4) Requirements for access control.
 - 5) Address for delivery of keys.
2. Pre-installation Conference
 - a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Inspect and discuss preparatory work performed by other trades.
 - c. Inspect and discuss electrical roughing-in for electrified door hardware.
 - d. Review sequence of operation for each type of electrified door hardware.
 - e. Review required testing, inspecting, and certifying procedures.
 - f. Review questions or concerns related to proper installation and adjustment of door hardware.
 3. Electrified Hardware Coordination Conference:
 - a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.
- B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.
- C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.
- D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.
- E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.
- F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.07 COORDINATION

- A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
- B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

- C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
- D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.08 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.
 - 1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
 - 2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
 - a. Mechanical Warranty
 - 1) Cylindrical Locks: 10 Years
 - 2) Mortise Locks: 3 Years
 - 3) Closers: 25 Years
 - b. Electrical Warranty
 - 1) Locks: 1 Year

1.09 MAINTENANCE

- A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
- B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
 - 1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.
- B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.
- C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

- D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.02 MATERIALS

A. Fabrication

1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer's recognized installation standards for application intended.
2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with "Metal Doors and Frames", "Flush Wood Doors", "Stile and Rail Wood Doors" to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

- B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.

1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.
2. For closers and panic devices: Verify with Architect and/or Owner if thru-bolts are required at specific door materials.

2.03 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Ives 5BB series
2. Acceptable Manufacturers and Products:
 - a. Hager BB series
 - b. McKinney TB series
 - c. Stanley FBB series

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. Hinge Height:
 - a. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide: 4-1/2 inches (114 mm) high
 - b. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide: 5 inches (127 mm) high
 - c. 2 inches or thicker doors: 5 inches (127 mm) high, regardless of door width
4. Hinge Width: 4-1/2 inches (114 mm) wide typical. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
5. Hinge quantity: Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
6. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:

- a. Steel Hinges: Steel pins
 - b. Non-Ferrous Hinges: Stainless steel pins
 - c. Out-Swinging Exterior Doors: Non-removable pins
 - d. Out-Swinging Interior Lockable Doors: Non-removable pins
 - e. Interior Non-lockable Doors: Non-rising pins
7. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.04 CONTINUOUS HINGES

A. Manufacturers:

- 1. Scheduled Manufacturer:
 - a. Ives
- 2. Acceptable Manufacturers:
 - a. Select
 - b. Pemko

B. Requirements:

- 1. Provide aluminum geared continuous hinges conforming to ANSI/BHMA A156.26, Grade 1.
- 2. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T6 aluminum.
- 3. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation.
- 4. Provide hinges capable of supporting door weights up to 450 pounds, and successfully tested for 1,500,000 cycles.
- 5. On fire-rated doors, provide aluminum geared continuous hinges classified for use on rated doors by testing agency acceptable to authority having jurisdiction.
- 6. Provide aluminum geared continuous hinges with electrified option scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
- 7. Provide hinges 1 inch (25 mm) shorter in length than nominal height of door, unless otherwise noted or door details require shorter length and with symmetrical hole pattern.
- 8. Adjust hinge model/width as required for door thickness or construction.

2.05 ELECTRIC POWER TRANSFER

A. Manufacturers:

- 1. Scheduled Manufacturer and Product:
 - a. Von Duprin EPT-10
- 2. Acceptable Manufacturers and Products:
 - a. Securitron CEPT-10

B. Requirements:

1. Provide power transfer with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware.
2. Locate electric power transfer per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.

2.06 CYLINDRICAL LOCKS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Falcon T series
2. Acceptable Manufacturers and Products:
 - a. Sargent 10-Line
 - b. Best 9K series

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.
 - a. Lever Design: Falcon Avalon (AVA).

2.07 MORTISE LOCKS AND DEADBOLTS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Falcon MA series
2. Acceptable Manufacturers and Products:
 - a. Sargent 8200 series
 - b. Best 45H series

B. Requirements:

1. Provide mortise locks conforming to ANSI/BHMA A156.13 Series 1000, Grade 1, and UL Listed for 3-hour fire doors.
2. Provide locks manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance.
3. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
4. Provide locks with standard 2-3/4 inches (70 mm) backset with full 3/4 inch (19 mm) throw stainless steel mechanical anti-friction latchbolt. Provide deadbolt with full 1-inch (25 mm) throw, constructed of stainless steel.

5. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim. Provide electrified options as scheduled in the hardware sets. Where scheduled, provide switches and sensors integrated into the locks and latches.
6. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses and external lever spring cages. Provide thru-bolted levers with 2-piece spindles.
 - a. Lever Design: Falcon Avalon Lever, Gala Rose (AG).

2.08 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Schlage/Von Duprin PS900 Series
2. Acceptable Manufacturers and Products:
 - a. Securitron BPS series

B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.
4. Provide power supplies with the following features:
 - a. 12/24 VDC Output, field selectable.
 - b. Class 2 Rated power limited output.
 - c. Universal 120-240 VAC input.
 - d. Low voltage DC, regulated and filtered.
 - e. Polarized connector for distribution boards.
 - f. Fused primary input.
 - g. AC input and DC output monitoring circuit w/LED indicators.
 - h. Cover mounted AC Input indication.
 - i. Tested and certified to meet UL294.
 - j. NEMA 1 enclosure.
 - k. Hinged cover w/lock down screws.
 - l. High voltage protective cover.

2.09 KEY CONTROL SYSTEM

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Telkee
2. Acceptable Manufacturers:
 - a. HPC
 - b. Lund

B. Requirements:

1. Provide key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of number of locks required for Project.
 - a. Provide complete cross index system set up by hardware supplier, and place keys on markers and hooks in cabinet as determined by final key schedule.
 - b. Provide hinged-panel type cabinet for wall mounting.

2.10 CYLINDER HOUSINGS

A. Manufacturers:

1. Scheduled Manufacturer and Product:
 - a. Falcon
2. Acceptable Manufacturers and Products:
 - a. Best
 - b. Sargent
 - c. Schlage

B. Requirements:

1. Provide cylinder housings from same manufacturer of locksets, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cylinder housings in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Cylinder/Core Type: Small Format Interchangeable Core (SFIC)
3. Replaceable Construction Cores.
 - a. Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
 - 1) 3 construction control keys
 - 2) 12 construction change (day) keys.
4. Verify with Owner where permanent cores are to be shipped to.

2.11 PERMANENT CORES, KEYING, KEYS

A. Manufacturers:

1. Scheduled Manufacturer: Best (BY ALLOWANCE, SEE 1.3)

B. Acceptable Manufacturers:

1. No Substitute

C. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.

D. Permanent Core Requirements:

1. Provide permanent cores compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.
2. Provide cores in the below-listed configuration(s), distributed throughout the Project as indicated.
 - a. Match Owner's existing system.
 - b. Cylinder/Core Type: Small Format Interchangeable Core (SFIC).
 - c. Nickel silver bottom pins.

E. Keying Requirements:

1. Provide a factory registered keying system, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
2. Provide keying system capable of multiplex masterkeying.
3. Permanent cores keyed by the manufacturer according to the following key system.
 - a. Keying system as directed by the Owner.
 - b. Match Owner's existing system.
 - c. (Great)Grand Master Key System: Cylinders/cores operated by change (day) keys and subsequent masters (including grand/great grand) keys.
4. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements shall be cause for replacement of cylinders/cores involved at no additional cost to Owner.
5. Provide keys with the following features:
 - a. Material: Nickel silver; minimum thickness of .107-inch (2.3mm).
6. Identification:
 - a. Mark permanent cylinders/cores and keys with applicable blind code per DHI publication "Keying Systems and Nomenclature" for identification. Blind code marks shall not include actual key cuts.
 - b. Identification stamping provisions must be approved by the Architect and Owner.
 - c. Stamp keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE".
 - d. Failure to comply with stamping requirements shall be cause for replacement of keys involved at no additional cost to Owner.
7. Quantity: Furnish in the following quantities.
 - a. Change (Day) Keys: 3 per cylinder/core.
 - b. Permanent Control Keys: 3 (if required).
 - c. Master Keys: 6 per master.
 - d. Unused balance of key blanks shall be furnished to Owner with the cut keys.
8. Verify with owner where permanent cores and keys are to be shipped to.

2.12 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
 - a. Falcon SC71A series
2. Acceptable Manufacturers and Products:
 - a. Sargent 351 series
 - b. Dorma 8900 Series

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.13 DOOR TRIM

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Trimco
 - b. Rockwood

B. Requirements:

1. Provide push plates, push bars, pull plates, pulls, and hands-free reversible door pulls with diameter and length as scheduled.

2.14 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Trimco
 - b. Rockwood

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.

2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.15 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:

1. Scheduled Manufacturers:
 - a. Glynn-Johnson
2. Acceptable Manufacturers:
 - a. Rixson

B. Requirements:

1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
2. Provide friction type at doors without closer and positive type at doors with closer.

2.16 DOOR STOPS AND HOLDERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Trimco
 - b. Rockwood

B. Provide door stops at each door leaf:

1. Provide wall stops wherever possible. Provide concave type where lockset has a push button or thumbturn.
2. Where a wall stop cannot be used, provide universal floor stops.
3. Where wall or floor stop cannot be used, provide overhead stop.
4. Provide roller bumper where doors open into each other and overhead stop cannot be used.

2.17 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Zero International
2. Acceptable Manufacturers:
 - a. National Guard
 - b. Reese
 - c. Pemko

B. Requirements:

1. Provide thresholds, weather-stripping, and gasketing systems as specified and per architectural details. Match finish of other items.
2. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
3. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
4. Size thresholds 1/2 inch (13 mm) high by 5 inches (127 mm) wide by door width unless otherwise specified in the hardware sets or detailed in the drawings.

2.18 SILENCERS

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Ives
2. Acceptable Manufacturers:
 - a. Rockwood
 - b. Trimco

B. Requirements:

1. Provide "push-in" type silencers for hollow metal or wood frames.
2. Provide one silencer per 30 inches (762 mm) of height on each single frame, and two for each pair frame.
3. Omit where gasketing is specified.

2.19 DOOR POSITION SWITCHES

A. Manufacturers:

1. Scheduled Manufacturer:
 - a. Schlage
2. Acceptable Manufacturers:
 - a. George Risk Industries, Inc.

B. Requirements:

1. Provide recessed or surface mounted type door position switches as specified.
2. Coordinate door and frame preparations with door and frame suppliers. If switches are being used with magnetic locking device, provide minimum of 4 inches (102 mm) between switch and magnetic locking device.

2.20 FINISHES

- A. Provide finish for each item as indicated in the sets.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
 - 1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
 - 2. Custom Steel Doors and Frames: HMMA 831.
 - 3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
 - 4. Installation Guide for Doors and Hardware: DHI TDH-007-20
- B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.
- C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.
- D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.
- F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
- G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.
- H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.
- I. Lock Cylinders:
 - 1. Install construction cores to secure building and areas during construction period.
 - 2. Replace construction cores with permanent cores as indicated in keying section.
- J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
 - 1. Conduit, junction boxes and wire pulls.

2. Connections to and from power supplies to electrified hardware.
 3. Connections to fire/smoke alarm system and smoke evacuation system.
 4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
 5. Connections to panel interface modules, controllers, and gateways.
 6. Testing and labeling wires with Architect's opening number.
- K. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- L. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.
- M. Closer/holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.
- N. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.
- O. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."
- P. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.
- Q. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.
- R. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.
- S. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.03 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.
1. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.04 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items per manufacturer's instructions to restore proper function and finish.

- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.05 DOOR HARDWARE SCHEDULE

- A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.
- B. Discrepancies, conflicting hardware, and missing items are to 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.
- C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.
- D. Hardware Sets:

110001 OPT0370303 Version 1

HARDWARE GROUP NO. 01

For use on Door #(s):

A114

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	PUSH PLATE	8200 4" X 16"	630	IVE
1	EA	PULL PLATE	8303 10" 4" X 16"	630	IVE
1	EA	SURFACE CLOSER	SC71A REG	689	FAL
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407 (CVX OR CCV AS REQ'D)	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 02

For use on Door #(s):

A110 A111 A113

Provide each OPENING with the following:

QTY	EA	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	PRIVACY LOCK	MA311 OCCUPIED/VACANT AGM	626	FAL
1	EA	SURFACE CLOSER	SC71A REG	689	FAL
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	MOP PLATE	8400 4" X 1" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407 (CVX OR CCV AS REQ'D)	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 03

For use on Door #(s):

A105.2

Provide each OPENING with the following:

QTY	EA	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	ENTRY / OFFICE LOCK	T511BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS) (VIA ALLOWANCE - SEE SPECS)	626	BES
1	EA	OH STOP	410S	652	GLY
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 04

For use on Door #(s):

A101 A104 A108 A109 A118

Provide each OPENING with the following:

QTY	EA	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	ENTRY / OFFICE LOCK	T511BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS) (VIA ALLOWANCE - SEE SPECS)	626	BES
1	EA	WALL STOP	WS406/407 (CVX OR CCV AS REQ'D)	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 05

For use on Door #(s):

A117.3 A117.4

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	224XY	628	IVE
1	EA	ENTRY / OFFICE LOCK	T511BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS)	626	BES
1	EA	SURFACE CLOSER (W/ SPRING STOP)	SC71A SS	689	FAL
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	RAIN DRIP	142AA	AA	ZER
1	SET	WEATHERSTRIPPING	429AA-S	AA	ZER
1	EA	DOOR SWEEP, BRUSH W/ DRIP	8198AA	AA	ZER
1	EA	THRESHOLD, 1/2"	655A	A	ZER
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE

HARDWARE GROUP NO. 06

For use on Door #(s):

A102

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	CLASSROOM LOCK	T561BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS) (VIA ALLOWANCE - SEE SPECS)	626	BES
1	EA	OH STOP	410S	652	GLY
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 07

For use on Door #(s):

A106 A112 A116

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	CLASSROOM LOCK	T561BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS) (VIA ALLOWANCE - SEE SPECS)	626	BES
1	EA	WALL STOP	WS406/407 (CVX OR CCV AS REQ'D)	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 08

For use on Door #(s):

A107.2

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	CLASSROOM LOCK	T561BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS)	626	BES
1	EA	SURFACE CLOSER	SC71A HDPA	689	FAL
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
1	EA	WALL STOP	WS406/407 (CVX OR CCV AS REQ'D)	630	IVE
1	EA	GASKETING	488SBK PSA	BK	ZER
1	EA	DOOR SWEEP, NEOPRENE	39A	A	ZER
1	EA	THRESHOLD, 1/4"	545A	A	ZER

HARDWARE GROUP NO. 09

For use on Door #(s):
A100.2

Provide each OPENING with the following:

QTY	EA	DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	ELEC STOREROOM LOCK	T881BDC AVA 12/24 VDC	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS)	626	BES
1	EA	SURFACE CLOSER (W/ SPRING STOP)	SC71A SS	689	FAL
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE
1	EA	CREDENTIAL READER	BY ACCESS CONTROL INTEGRATOR		B/O
1	EA	DESK MOUNT BUTTON	660-PB	628	SCE
1	EA	POWER SUPPLY	PS902 900-4RL 120/240 VAC	LGR	SCE

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING VALID CREDENTIAL TO READER, OR PUSH BUTTON AT RECEPTION DESK, WILL UNLOCK OUTSIDE LEVER, ALLOWING ACCESS. DOOR REMAINS LOCKED WITH LOSS OF POWER. FREE EGRESS AT ALL TIMES.

HARDWARE GROUP NO. 10

For use on Door #(s):

A100.1 A105.1 A107.1

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	CONT. HINGE	112XY EPT (OR 027XY EPT AS REQ'D FOR DR THK)	628	IVE
1	EA	POWER TRANSFER	EPT10	689	VON
1	EA	EU STOREROOM LOCK	T881H6 AVA 12/24 VDC	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS)	626	BES
1	EA	SURFACE CLOSER (W/ SPRING STOP)	SC71A SS	689	FAL
1	EA	MOUNTING PLATE	SC70-18PA	689	FAL
1	EA	CUSH SHOE SUPPORT	SC70-30	689	FAL
1	EA	BLADE STOP SPACER	SC70A-61	689	FAL
1	EA	RAIN DRIP	142AA	AA	ZER
1	EA	WEATHERSTRIPPING	BY DOOR/FRAME MANUFACTURER		B/O
1	EA	DOOR SWEEP, BRUSH W/ DRIP	8198AA	AA	ZER
1	EA	THRESHOLD, 1/2"	655A	A	ZER
1	EA	CREDENTIAL READER	BY ACCESS CONTROL INTEGRATOR		B/O
1	EA	DOOR CONTACT	679 SERIES	BLK	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC	LGR	SCE

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING VALID CREDENTIAL TO READER WILL UNLOCK OUTSIDE LEVER, ALLOWING ACCESS. DOOR REMAINS LOCKED WITH LOSS OF POWER. FREE EGRESS AT ALL TIMES.

HARDWARE GROUP NO. 11

For use on Door #(s):

A115

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 SIZE, QTY, NRP AS REQ'D (SEE SPECS)	652	IVE
1	EA	STOREROOM LOCK	T581BDC AVA	626	FAL
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS)	626	BES
1	EA	SURFACE CLOSER (W/ DEAD STOP)	SC71A DS	689	FAL
1	EA	KICK PLATE	8400 10" X 1 1/2" LDW B-CS	630	IVE
3	EA	SILENCER	SR64	GRY	IVE

HARDWARE GROUP NO. 12

For use on Door #(s):

A117.1 A117.2 A117.6 A117.8 A117.9 A117.10
A117.11

Provide each OPENING with the following:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
1	EA	PERMANENT CORE	BEST (BY ALLOWANCE - SEE SPECS)	626	BES
1	EA	MORTISE CYL HOUSING (SFIC)	C987 X C606CCA	626	FAL

END OF SECTION

Johnson County Recycling Center

<u>DOOR#</u>	<u>HWSET#</u>
A100.1	10
A100.2	09
A101	04
A102	06
A104	04
A105.1	10
A105.2	03
A106	07
A107.1	10
A107.2	08
A108	04
A109	04
A110	02
A111	02
A112	07
A113	02
A114	01
A115	11
A116	07
A117.1	12
A117.2	12
A117.3	05
A117.4	05
A117.6	12
A117.8	12
A117.9	12
A117.10	12
A117.11	12
A118	04

SECTION 08800

GLAZING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes glass and glazing.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI Z97.1 - Safety Glazing Materials Used in Buildings Safety.
- B. American Society of Civil Engineers:
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International:
 - 1. ASTM C1036 - Standard Specification for Flat Glass.
 - 2. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures : Submittal procedures.
- B. Shop Drawings:
 - 1. Indicate sizes, layout, thicknesses, and loading conditions for glass.

1.4 SUSTAINABLE DESIGN SUBMITTALS

- A. Sustainable Design Requirements: Requirements for sustainable design submittals.
- B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
 - 1. Materials Resources Certificates:
 - a. Certify recycled material content for recycled content products.
 - b. Certify source for local and regional materials and distance from Project site.
 - 2. Indoor Air Quality Certificates:
 - a. Certify volatile organic compound content for each interior adhesive and sealant and related primer.
- C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
 - 1. Provide cost data for the following products:
 - a. Products with recycled material content.
 - b. Local and regional products.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

PART 2 PRODUCTS

2.1 FLOAT GLASS MATERIALS

- A. Tempered Glass: ASTM C1048, Type 1 transparent flat, Quality Q3, Kind FT fully tempered, Condition A uncoated, float glass with horizontal tempering.
 - 1. Furnish tempered glass where heat strengthened glass cannot meet specified performance requirements.

2.2 FLOAT GLASS PRODUCTS

- A. Float Glass Manufacturers:
 - 1. ACH Glass Operations.
 - 2. AFG Industries, Inc.
 - 3. Guardian Industries Corp.
 - 4. PPG Industries
 - 5. Pilkington North America, Inc.
 - 6. Or Approved Equal.
- B. Clear Glass: Tempered float glass as specified; Class 1 clear.
 - 1. Minimum Thickness: 1/4.

2.3 INSULATING GLASS PRODUCTS

- A. Insulating Glass Manufacturers:
 - 1. PPG Vitro Architectural Glass
 - 2. AFG Industries, Inc.
 - 3. Arch Aluminum and Glass
 - 4. Guardian Industries Corp.
 - 5. Viracon
 - 6. Or Approved Equal.
- B. Insulating Glass: ASTM E2190 certified by Insulating Glass Certification Council; with edge seal; purge interpane space with dry hermetic air.
 - 1. Total Unit Thickness: 1 inch.
 - 2. Insulating Glass Unit Edge Seal Construction: Manufacturer's standard.
 - 3. Outer Pane: 1/4 inch thick tempered.
 - 4. Air Space: 1/2 inch.
 - 5. Inner Pane: 1/4 inch thick tempered with Low E coating.

2.4 GLAZING SEALANTS

- A. Elastomeric Glazing Sealants: Materials compatible with adjacent materials including glass, laminated glass core, insulating glass seals, and glazing channels.
 - 1. Silicone Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component; chemical curing; capable of water immersion without loss of properties; non-bleeding, non-staining, cured Shore A hardness of 15 to 25.
 - a. Color: As selected.
 - b. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
 - 2. Polyurethane Glazing Sealant: ASTM C920, Type S, Grade NS, Class and Use suitable for glazing application indicated; single component, chemical curing, non-staining, non-bleeding, Shore A Hardness Range 20 to 35.
 - a. Color: As selected.
 - b. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.

- B. Dense Gaskets: Resilient extruded shape to suit glazing channel retaining slot; black.
 - 1. Neoprene: ASTM C864.
 - 2. EPDM: ASTM C864.
 - 3. Silicone: ASTM C1115.

- C. Soft Gaskets: ASTM C509; resilient extruded shape to suit glazing channel retaining slot; black.
 - 1. Neoprene.
 - 2. EPDM.
 - 3. Silicone.

- D. Pre-Formed Glazing Tape: Size to suit application.
 - 1. Preformed butyl compound 10 to 15 Shore A durometer hardness; coiled on release paper; black color.
 - a. Butyl Corner Sealant: ASTM C920 single component non-skinning butyl compatible with glazing tape; color to match tape.
 - b. Interior Sealants and Sealant Primers: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.
 - 2. Glazing Tape: Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume of 2 percent, designed for compression of 25 percent to effect an air barrier and vapor retarder seal.
 - a. Interior Adhesives: Maximum volatile organic compound content in accordance with SCAQMD Rule 1168.

2.5 GLAZING ACCESSORIES

- A. Setting Blocks: Elastomeric material recommended by glass manufacturer, 80 to 90 Shore A durometer hardness, length of 0.1 inch for each square foot (25 mm for each square meter) of glazing or minimum 4 inch (100 mm) x width of glazing rabbet space minus 1/16 inch (1.5 mm) x height to suit glazing method and pane weight and area.

- B. Spacer Shims: Elastomeric material recommended by glass manufacturer, 50 to 60 Shore A durometer hardness, minimum 3 inch (75 mm) long x one half the height of glazing stop x thickness to suit application , self adhesive on one face.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify openings for glazing are correctly sized and within acceptable tolerance.
- B. Verify surfaces of glazing channels or recesses are clean, free of obstructions impeding moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION

- A. Perform installation in accordance with GANA Glazing Manual.
 - 1. Glazing Sealants: Comply with ASTM C1193.
 - 2. Fire Rated Openings: Comply with NFPA 80.
- B. Exterior Dry Method (Gasket Glazing):
 - 1. Cut glazing gasket to length; install on glazing pane. Seal corners by butting tape and sealing junctions with compatible butyl sealant.
 - 2. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
 - 3. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
 - 4. Install removable stops without displacing glazing spline. Exert pressure for full continuous contact.
- C. Exterior Wet/Dry Method (Preformed Tape and Sealant) Installation:
 - 1. Cut glazing tape to length and set against permanent stops, 3/16 inch (5 mm) below sight line. Seal corners by butting tape and dabbing with compatible butyl sealant.
 - 2. Apply heel bead of butyl sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapor seal.
 - 3. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
 - 4. Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of pane or glass unit.

5. Install removable stops, with spacer strips inserted between glazing and applied stops, 1/4 inch (6 mm) below sight line
 6. Fill gap between glazing and stop with elastomeric glazing sealant to depth equal to bite of frame on glazing, but not more than 3/8 inch (9 mm) below sight line.
 7. Apply cap bead of elastomeric glazing sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- D. Exterior Wet Method (Sealant and Sealant) Installation:
1. Place setting blocks at 1/4 points and install glazing pane or unit.
 2. Install removable stops with glazing centered in space by inserting spacer shims both sides at 24 inches (600 mm) intervals, 1/4 inch (6 mm) below sight line.
 3. Fill gaps between glazing and stops with elastomeric glazing sealant to depth of bite on glazing, but not more than 3/8 inch (9 mm) below sight line to ensure full contact with glazing and continue the air and vapor seal.
 4. Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.
- E. Exterior and Interior Butt Glazed Method (Sealant Only) Installation:
1. Temporarily brace glass in position for duration of glazing process. Mask edges of glass at adjoining glass edges and between glass edges and framing members.
 2. Temporarily secure small diameter non-adhering foamed rod on back side of joint.
 3. Apply sealant to open side of joint in continuous operation; thoroughly fill joint without displacing foam rod. Tool sealant surface smooth to concave profile.
 4. Permit sealant to cure then remove foam backer rod. Apply sealant to opposite side, tool smooth to concave profile.
 5. Remove masking tape.
- F. Interior Wet/Dry Method (Tape and Sealant) Installation:
1. Cut glazing tape to length and install against permanent stops, projecting 1/16 inch (1.6 mm) above sight line.
 2. Place setting blocks at 1/4 points with edge block no more than 6 inches (150 mm) from corners.
 3. Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of pane or unit.
 4. Install removable stops, spacer shims inserted between glazing and applied stops at 24 inch (600 mm) intervals, 1/4 inch (6 mm) below sight line.
 5. Fill gaps between pane and applied stop with elastomeric glazing sealant to depth equal to bite on glazing, to uniform and level line.
 6. Trim protruding tape edge.
- G. Interior Wet Method (Compound and Compound) Installation:
1. Install glazing resting on setting blocks. Install applied stop and center pane by use of spacer shims at 24 inch (600 mm) centers, kept 1/4 inch (6 mm) below sight line.
 2. Locate and secure glazing pane using spring wire clips or glazers' clips.
 3. Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.4 CLEANING

- A. Remove glazing materials from finish surfaces.

- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

END OF SECTION

SECTION 09 21 16

GYP SUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes metal stud wall framing; metal channel ceiling framing, special trim pieces; gypsum board and joint treatment.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C475 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.
 - 2. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members.
 - 3. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 4. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
 - 5. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.
 - 6. ASTM C1002 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases.
 - 7. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing.
 - 8. ASTM C1396 - Standard Specification for Gypsum Board.
 - 9. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 10. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
- B. Gypsum Association:
 - 1. GA 214 - Recommended Levels of Gypsum Board Finish.
 - 2. GA 216 - Application and Finishing of Gypsum Board.
 - 3. GA 600 - Fire Resistance Design Manual Sound Control.
- C. Underwriters Laboratories Inc.:
 - 1. UL - Fire Resistance Directory.
- D. Intertek Testing Services (Warnock Hersey Listed):
 - 1. WH - Certification Listings.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing, acoustic seals, and trim.

- C. Product Data: Submit data on metal framing, gypsum board, joint tape; and trim.
- D. Evaluation Reports: Submit evaluation reports certified under an independent third-party inspection program administered by an agency accredited by IAS to ICC-ES AC98 IAS accreditation criteria for inspection agencies.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM C840, ASTM C1280, GA-214, GA-216 and GA-600.
- B. Code-Compliance Certification of Studs and Tracks: Provide documentation that framing members are certified in accordance with the product-certification program of the Steel Framing Industry Association (SFIA) or a similar organization that provides a verifiable code compliance program.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect cold-formed metal framing from corrosion, deformation, and other damage during delivery, storage, and handling as required by AISI S202 "Code of Standard Practice."

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- C. Design framing systems in accordance with ASTM C645.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Steel Framing Manufacturers:
 - 1. ClarkDietrich.
 - 2. MarinoWare.
 - 3. MBA Building Supplies.
- B. Gypsum Board and Related Product Manufacturers:
 - 1. CertainTeed Gypsum
 - 2. G-P Gypsum Corp.
 - 3. Lafarge.
 - 4. National Gypsum Co.
 - 5. United States Gypsum Co.

2.2 COMPONENTS

- A. Framing Materials, General: Comply with ASTM C645, AISI S220 and ASTM C645, Section 10, AISI S220 for conditions indicated.

1. Protective Coating: Comply with ASTM C645; ASTM A653/A653M, G40 (Z120) or coating with equivalent corrosion resistance of ASTM A653/A653M, G40 (Z120). Galvanized products are not acceptable.
 - a. Coating: ClarkDietrich; DiamondPlus® Coating, or comparable.
 - 1) Coating roll-formed from steel complying with mechanical and chemical requirements of ASTM A1003 with a zinc-based coating.
 - b. Coatings shall demonstrate equivalent corrosion resistance with an evaluation report acceptable to authorities having jurisdiction.

- B. Studs and Tracks:
 1. Typical Locations: ASTM C645; galvanized sheet steel, 20 gauge (0.0296 inch) minimum thick, C shape.
 2. Locations receiving abuse resistant gypsum panels, high impact resistant panels or exterior sheathing shall be 20 gauge (0.0296 inch) minimum thickness.

- C. Equivalent Gauge Studs and Tracks:
 1. ClarkDietrich; ProSTUD 20 (20EQ) and ProTRAK 20 (20EQ) with Smart Edge technology or comparable product.
 2. Minimum Base-Steel Thickness: 0.0181 inch (0.4597 mm).
 3. Equivalent Gauge Thickness ("EQ") Steel Studs and Runners: Members that can show certified third-party testing with gypsum board in accordance with ICC-ES AC86 (Reapproved August 2015) need not comply with minimum thickness limitation or minimum section properties set forth in ASTM C645. Submission of an evaluation report is acceptable to show compliance with this requirement.

- D. Furring, Framing, and Accessories: ASTM C645.
 1. ClarkDietrich; Hat-Shaped, Rigid Furring Channels, or comparable product.
 - a. Minimum Base-Steel Thickness: 0.0179 inch (0.45 mm).
 2. Fasteners: ASTM C1002.
 3. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

- E. Gypsum Board Materials:
 1. Standard Gypsum Board: ASTM C1396; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.
 2. Fire Rated Gypsum Board Type X: ASTM C1396; fire resistive type, UL or WH rated; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.
 3. Moisture Resistant Gypsum Board: ASTM C630; 5/8 inch thick, maximum available length in place; ends square cut, tapered edges.

2.3 ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced, thickness to match stud depth.
- B. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board; manufactured by Pecora, USG or ChemRex.
- C. Comer Beads: Metal.
- D. Edge Trim: Type U exposed reveal bead.

- E. Special Trim Pieces, Expansion Joints and Reveals: As manufactured by Fry Reglet to suit installation as indicated on the drawings.
- F. Joint Materials:
 - 1. Typical: ASTM C475; reinforcing tape, joint compound, adhesive, and water.
 - 2. For abuse resistant gypsum panels, high impact resistant panels or exterior sheathing use sheetrock joint tape and sheetrock setting type (Durabond 45 or 90) or lightweight setting-type (Easy Sand 45 or 90) joint compound as manufactured by United States Gypsum Co. Follow manufacturer's recommendations for each application.
 - 3. For mold resistant gypsum board use joint materials as recommended by the Manufacturer.
- G. Fasteners: ASTM C1002, Type S12 for steel studs.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Metal Stud Installation:
 - 1. Install studs in accordance with ASTM C754 and the Manufacturer's instructions.
 - 2. Metal Stud Spacing: 16 inches on center.
 - 3. Refer to Drawings for indication of partitions extending stud framing through ceiling to structure above. Maintain clearance under structural building members to avoid deflection transfer to studs. Provide extended leg ceiling runners.
 - 4. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.
 - 5. Blocking: Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, wood frame opening, toilet accessories, hardware, and all other items indicated on the drawings to attach to the wall.
- B. Wall Furring Installation:
 - 1. Erect wall furring for direct attachment to concrete masonry and concrete walls.
 - 2. Erect furring channels vertically; space maximum 16 inches oc, not more than 4 inches from floor, ceiling lines and abutting walls.
 - 3. Install thermal insulation between Z-furring channels directly attached to concrete masonry and concrete walls.
- C. Furring For Fire Ratings: Install furring as required for fire resistance ratings indicated.
- D. Ceiling Framing Installation:
 - 1. Install in accordance with ASTM C754.
 - 2. Coordinate location of hangers with other work.
 - 3. Install ceiling framing independent of walls, columns, and above ceiling work.

4. Reinforce openings in ceiling suspension system which interrupt main carrying channels or furring channels, with lateral channel bracing. Extend bracing minimum 24 inches past each end of openings.
5. Laterally brace entire suspension system.

E. Acoustic Accessories Installation:

1. Install resilient channels at maximum 24 inches on center. Locate joints over framing members.
2. Place acoustic insulation in partitions tight within spaces, around cut openings, behind and around electrical and mechanical items within or behind partitions, and tight to items passing through partitions.
3. Install acoustic sealant within partitions.

F. Gypsum Board Installation:

1. Install gypsum board in accordance with GA-216 and GA-600.
2. Erect single layer standard gypsum board vertical, with ends and edges occurring over firm bearing.
3. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.
4. Erect exterior gypsum sheathing in accordance with ASTM C1280, horizontally, with edges butted and ends occurring over firm bearing.
5. Use screws when fastening gypsum board to metal furring or framing.
6. Double Layer Applications: Use gypsum backing board for first layer, placed perpendicular to framing or furring members. Use fire rated gypsum backing board for fire rated partitions and ceilings.
7. Double Layer Applications: Secure second layer with fasteners.
8. Place second layer perpendicular to first layer. Offset joints of second layer from joints of first layer.
9. Use moisture resistant gypsum board in all restrooms, kitchens or similar wet areas. Treat cut edges and holes in moisture resistant gypsum board with sealant.
10. Place control joints consistent with lines of building spaces. Distance between control joints shall not to exceed 30 ft.
11. Place comer beads at external comers. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
12. Install cementitious backing board over metal studs.
13. Apply gypsum board to curved walls in accordance with GA-216.

G. Joint Treatment:

1. Finish in accordance with GA-214 Level 4 or Level 5 for walls exposed to critical lighting.
2. Fill and finish joints and comers of cementitious backing board.

3.3 ERECTION TOLERANCES

A. Division 01 - Quality Requirements: Tolerances.

B. Maximum Variation of Finished Gypsum Board Surface from Flat Surface: 1/8 inch in 10 feet.

3.4 SCHEDULES

A. Finishes in accordance with GA-214 Level:

1. Level 1: Above finished ceilings concealed from view unless a higher level of finish is required for fire-resistance-rated assemblies.
2. Level 4: Walls exposed to view.
3. Level 4: Ceilings exposed to view.
4. Level 5: All walls exposed to critical lighting.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Tile.
 - 2. Tile backer board.
 - 3. Tile edging.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI A108.1 - Installation of Ceramic Tile, A collection.
 - 2. ANSI A108.10 - Specifications for Installation of Grout in Tilework.
 - 3. ANSI A108.1A - Specifications for Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar.
 - 4. ANSI A108.1B - Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar.
 - 5. 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 Setting Bed with Dry-Set or Latex Portland Cement Mortar.
 - 6. ANSI A108.5 - Specifications for Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
 - 7. ANSI A108.6 - Specifications for Ceramic Tile Installed with Chemical-Resistant, Water-Cleanable Tile-Setting and -Grouting Epoxy.
 - 8. ANSI A118.4 - Latex-Portland Cement Mortar.
 - 9. ANSI A118.6 - Ceramic Tile Grouts.
 - 10. ANSI A137.1 - Ceramic Tile.
- B. Tile Council of America:
 - 1. TCA - Handbook for Ceramic Tile Installation.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, accessories, and setting details.
- C. Product Data: Submit instructions for using grouts.

- D. Samples: Submit mounted tile and grout on two plywood panels, 12 x 12 inch in size illustrating pattern, color variations, and grout joint size variations.
- E. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with TCA Handbook and ANSI A108 Series/A118 Series.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum five years documented experience.

1.7 MOCKUP

- A. Division 01 - Quality Requirements: Requirements for mockup.
- B. Construct tile and base mock-up, 6 feet long by 8 feet wide, with finish grout, and specified accessories.
- C. Locate where directed.
- D. Incorporate accepted mockup as part of Work.

1.8 PRE-INSTALLATION MEETINGS

- A. Division 01 - Administrative Requirements: Pre-installation meeting.
- B. Convene minimum one week prior to commencing work of this section.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Protect adhesives and grouts from freezing or overheating.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.
- B. Do not install adhesives and grouts in unventilated environment.
- C. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.11 EXTRA MATERIALS

- A. Division 01 - Execution Requirements: Spare parts and maintenance products.
- B. Supply 100 sq ft of each size, color, and surface finish of tile specified.

PART 2 PRODUCTS

2.1 TILE

- A. Manufacturers:
 - 1. Tile
 - a. Refer to the Room/Material Finish Schedule.

2.2 MORTAR AND GROUT MATERIALS

- A. Manufacturers:
 - 1. Ardex
 - 2. Bonsal, W.R., Company.
 - 3. Bostik
 - 4. C-Cure.
 - 5. Custom Building Products.
 - 6. LATICRETE International Inc.
 - 7. MAPEI Corporation.
 - 8. Summitville Tiles, Inc.
 - 9. TEC Specialty Products, Inc.
- B. Mortar Materials:
 - 1. Mortar Bed Materials: Portland cement, sand, latex additive and water.
 - 2. Mortar Bond Coat Materials:
 - a. Latex-Portland Cement type: ANSI A118.4.
- C. Grout Materials:
 - 1. Standard Grout: Latex-Portland cement type as specified in ANSI A118.6.
 - a. Standard Grout Locations: All corridor floors and walls.
 - 2. Colors: As selected by the Architect.

2.3 ACCESSORIES

- A. Cement Backer Board: Provide USG Durock Brand Cement Board.
- B. Tile Edging: Angle or L-shape, height to match tile and setting bed thickness, metallic designed specifically for applications. Provide Schiene-AE by Schluter Systems L.P. (800-472-4588) or Great Lakes Tile Products (248-656-8100).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify surfaces are ready to receive work.

3.2 PREPARATION

- A. Protect surrounding work from damage.
- B. Vacuum clean surfaces and damp clean.
- C. Seal substrate surface cracks with filler. Apply crack suppression membrane over all cracks in substrate.
- D. Level existing substrate surfaces to acceptable flatness tolerances.

3.3 INSTALLATION

- A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.10, and TCA Handbook recommendations.
- B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.
- C. Place edge strips at exposed tile edges.
- D. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly using all trim pieces available. Align floor, base and wall joints.
- E. Place tile with joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.
- F. Grout Joint Width for all porcelain tile: 1/8 inch.
- G. Grout Joint Width for all quarry tile: match existing.
- H. Form internal angles coved and external angles bullnosed.
- I. Install ceramic accessories rigidly in prepared openings.

- J. Sound tile after setting. Replace hollow sounding units.
- K. Keep control joints free of adhesive or grout. Apply sealant to joints.
- L. Allow tile to set for a minimum of 48 hours prior to grouting.
- M. Grout tile joints. Use standard grout at ceramic mosaic tile and use epoxy grout at quarry tile.
- N. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.
- O. Installation:
 - 1. Install in accordance with TCA Handbook.

3.4 CLEANING

- A. Clean tile and grout surfaces.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

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

3.6 SCHEDULES

- A. See Room Finish Schedule.

END OF SECTION

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes suspended metal grid ceiling system, perimeter trim, acoustic panels.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - 2. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
 - 3. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
 - 4. ASTM E580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.
 - 5. ASTM E1264 - Standard Classification for Acoustical Ceiling Products.
- B. Ceilings and Interior Systems Construction Association:
 - 1. CISCA - Acoustical Ceilings: Use and Practice.
- C. Underwriters Laboratories Inc.:
 - 1. UL - Fire Resistance Directory.

1.3 PERFORMANCE REQUIREMENTS

- A. Suspension System: Rigidly secure acoustic ceiling system including integral mechanical and electrical components with maximum deflection of 1: 240.

1.4 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, interrelation of mechanical and electrical items related to system and wall layouts. Indicate method of suspension where interference exists.
- C. Product Data: Submit data on metal grid system components, acoustic units and accessories.
- D. Samples: Submit two full size samples illustrating material and finish of acoustic units.

- E. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner, perimeter molding and hold down clips.
- F. Manufacturer's Installation Instructions: Submit special procedures, perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

- A. Conform to CISCA requirements.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.
- C. Provide seismic design of suspended ceiling under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.
- B. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustic unit installation.

1.8 SEQUENCING

- A. Sequence Work to ensure acoustic 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. Install acoustic units after interior wet work is dry.

1.9 EXTRA MATERIALS

- A. Division 01 - Execution Requirements: Spare parts and maintenance products.
- B. Furnish 10 percent of total acoustic unit area of extra panels to Owner.

PART 2 PRODUCTS

2.1 ACOUSTICAL PANELS

- A. Type APC-A
 - 1. Acceptable Manufacturer/Product:

- a. Armstrong; Fine Fissured with HumiGuard Plus and BioBlock.
 - b. Certaineed; Fine Fissured with BioShield HHF-157.
 - c. USG; Radar ClimaPlus mold/mildew retardant.
2. Size: 24 x 24 inches.
 3. Thickness: 5/8 inches.
 4. Light Reflectance: Not less than 0.80.
 5. NRC: Not less than 0.50.
 6. CAC: Not less than 30.
 7. Edge: Square.
 8. Surface Color: White.
 9. Locations: Typical.

B. Type APC-B

1. Acceptable Manufacturer/Product:
 - a. Armstrong; Clean Room VL
 - b. CertainTeed; VinylShield A
2. Size: 24 x 24 inches.
3. Locations: Restrooms and other locations indicated on drawings.

2.2 GRID

A. Acceptable Manufacturers:

1. Armstrong.
2. USG.
3. Chicago Metallic.
4. Certaineed.

B. Non-fire Rated Grid: ASTM C635, intermediate duty; exposed T as indicated; components die cut and interlocking.

C. Fire Rated Grid: ASTM C635, intermediate duty, listed by UL, exposed T; components die cut and interlocking.

1. Grid Materials: Commercial quality cold rolled steel with galvanized coating.
2. Exposed Grid Surface Width: 15/16 inch unless 9/16 is indicated.
3. Grid Finish: White.
4. Accessories: Stabilizer bars, clips, splices, perimeter moldings, hold down clips, and accessories required for suspended grid system.
5. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

2.3 ACCESSORIES

- A. Acoustic Batt Insulation: ASTM C665, friction fit type, unfaced; size cut to fit acoustic system.
- B. Gypsum Board: Fire rated type; 5/8 inch thick, ends and edges square, paper faced.
- C. Acoustic Sealant For Perimeter Moldings: Acoustical sealant by USG or Pecora.

- D. Touch-up Paint: Type and color to match acoustic and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify layout of hangers will not interfere with other work.

3.2 EXISTING WORK

- A. Extend existing acoustical ceiling installations using materials and methods as specified.
- B. Clean and repair existing acoustical ceilings which remain or are to be reinstalled.

3.3 INSTALLATION

- A. Lay-In Grid Suspension System:
 - 1. Install suspension system in accordance with ASTM C636 and as supplemented in this section.
 - 2. Install system in accordance with ASTM E580.
 - 3. Install system capable of supporting imposed loads to deflection of 1/240 maximum.
 - 4. Locate system on room axis according to reflected plan.
 - 5. Install after major above ceiling work is complete. Coordinate location of hangers with other work.
 - 6. Install hanger clips during steel deck erection. Install additional hangers and inserts as required.
 - 7. 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.
 - 8. Where ducts or other equipment prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
 - 9. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.
 - 10. Do not eccentrically load system, or produce rotation of runners.
 - 11. Perimeter Molding:
 - a. Install edge molding at intersection of ceiling and vertical surfaces into bed of acoustic sealant.
 - b. Use longest practical lengths.
 - c. Miter corners.
 - d. Install at junctions with other interruptions.
 - 12. Form expansion joints. Form to accommodate plus or minus 1 inch movement. Maintain visual closure.

13. Install light fixture boxes constructed of gypsum board above light fixtures in accordance with UL assembly requirements and light fixture ventilation requirements.

B. Acoustic Units:

1. Fit acoustic units in place, free from damaged edges or other defects detrimental to appearance and function.
2. Lay directional patterned units one way with pattern parallel to longest room axis. Fit border trim neatly against abutting surfaces.
3. Install units after above ceiling work is complete.
4. Install acoustic units level, in uniform plane, and free from twist, warp, and dents.
5. Cutting Acoustic Units:
 - a. Cut to fit irregular grid and perimeter edge trim.
 - b. Cut reveal edges to field cut units.
 - c. Double cut and field paint exposed edges of tegular units.
6. Where bullnose concrete block corners or round obstructions occur, install preformed closures to match perimeter molding.
7. Lay acoustic insulation for distance of 48 inches on both sides of acoustic partitions.
8. Install hold-down clips to retain panels tight to grid system within 20 ft of exterior door.

3.4 ERECTION TOLERANCES

- A. Division 01 - Quality Requirements: Tolerances.
- B. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.
- C. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 09 6500 - RESILIENT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Resilient base.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
 - 3. ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
 - 4. ASTM F1066 - Standard Specification for Vinyl Composition Floor Tile.
 - 5. ASTM F1861 - Standard Specification for Resilient Wall Base.
- B. Federal Specification Unit:
 - 1. FS RR-T-650 - Treads, Metallic and Nonmetallic, Skid Resistant.
- C. National Fire Protection Association:
 - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

1.3 PERFORMANCE REQUIREMENTS

- A. Conform to applicable code for fire performance ratings.

1.4 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Samples:
 - 1. Submit manufacturer's complete set of color samples for initial selection.
 - 2. Submit two samples, 4 x 4 inch in size illustrating color and pattern for each resilient flooring product specified.
- D. Test Results: Submit moisture test results before starting installation.

1.5 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Division 01 - Product Requirements: Product storage and handling requirements.
- B. Protect roll materials from damage by storing on end.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.
- B. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (32 degrees C).
- C. Store materials for not less than 48 hours prior to installation in area of installation at temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).

1.9 EXTRA MATERIALS

- A. Division 01 - Execution Requirements: Spare parts and maintenance products.
- B. Furnish 30 lineal feet of base of each type and color specified.

PART 2 - PRODUCTS

2.1 RESILIENT BASE

- A. Manufacturers:
 - 1. Azrock by Tarkett.
 - 2. Freudenberg Building Systems, Inc., Nora Rubber Flooring Div.
 - 3. Johnsonite, Div. of Duramax, Inc.
 - 4. Marley Floors-Flexco.
 - 5. Roppe Corp..

RESILIENT FLOORING

6. VPI Floor Products Div.
- B. Base: ASTM F1861 Rubber; top set covered:
 1. Height: 4 inch.
 2. Thickness: 0.125 inch thick.
 3. Length: Roll.
 4. Accessories: Premolded end stops.

2.2 ACCESSORIES

- A. Primers and Adhesives: High Moisture types recommended by flooring manufacturer.
- B. Moldings and Edge Strips: Same material as flooring manufactured by Roppe or Johnsonite.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Division 01 - Project Management and Coordination: Verification of existing conditions before starting Work.
- B. Test concrete floors for moisture content, negative alkalinity, carbonization, and dusting. Provide results to the Architect.
- C. Clear surfaces free of substances capable of impairing adhesion of moisture barrier. Shot blast if required.

3.2 PREPARATION

- A. Clean substrate.
- B. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances cannot be removed. Apply primer to surfaces as recommended by the flooring manufacturer.
- C. Fit joints tightly and make vertical.
- D. Miter internal corners. At external corners, 'V' cut back of base strip to 2/3 of its thickness and fold. At exposed ends, use premolded units.
- E. Install base on solid backing. Bond tightly to wall and floor surfaces.
- F. Scribe and fit to door frames and other interruptions.

3.3 CLEANING

- A. Division 01 - Execution Requirements: Final cleaning.

- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean, seal, and maintain resilient flooring products.

3.4 SCHEDULE

- A. See Room Finish Schedule.

END OF SECTION 09 6500

SECTION 09 68 50

CARPET TILE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes preparation of slabs.
- B. Section includes carpet tile, planks and accessories.

1.2 REFERENCES

- A. ASTM International:
 - 1. ASTM D2859 - Standard Test Method for Flammability of Finished Textile Floor Covering Materials.
 - 2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 3. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- B. Carpet and Rug Institute:
 - 1. CRI 104 - Standard for Installation of Commercial Carpet.
- C. National Fire Protection Association:
 - 1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

1.3 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Indicate layout of joints, direction of carpet pile and location of edge moldings.
- C. Product Data: Submit data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- D. Samples:
 - 1. Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- E. Manufacturer's Installation Instructions: Submit special procedures and perimeter conditions requiring special attention.

1.4 CLOSEOUT SUBMITTALS

- A. Division 01 - Execution Requirements: Closeout procedures.
- B. Operation and Maintenance Data: Submit maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Installer: Company specializing in performing Work of this section with minimum three years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Division 01 - Product Requirements.
- B. Store materials in area of installation for 48 hours prior to installation.

1.7 EXTRA MATERIALS

- A. Division 01 - Execution Requirements: Spare parts and maintenance products.
- B. Supply one carton of carpet tiles of each color and pattern selected.

PART 2 PRODUCTS

2.1 CARPET TILE

- A. Manufacturers:
 - 1. Refer to Room/Material Finish Schedule.

2.2 ACCESSORIES

- A. Sub-Floor Filler: Latex Type recommended by flooring material manufacturer.
- B. Moisture Barrier: Mapei Planiseal VS Fast or equal as recommended by the flooring and adhesive manufacturers.
- C. Moldings and Edge Strips: Rubber or vinyl, color as selected. Manufactured by Johnsonite.
- D. Contact Adhesive: Recommended by carpet manufacturer, releasable type.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Division 01 - Administrative Requirements: Coordination and project conditions.
- B. Verify floor surfaces are smooth and flat within tolerances specified in Concrete Section and are ready to receive work.

3.2 PREPARATION

- A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with sub-floor filler.
- B. Where existing floor finishes occur, the installer shall consider major slab preparation will be required after removal of existing floor finish. The installer shall include in his bid, major floor preparation. Additional costs will not be considered.
- C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.
- D. Clean substrate.
- E. Test concrete floor slabs for moisture content. Provide results to the Architect.
- F. Install Mapei Planiseal VS Fast moisture barrier or equal product as recommended by the flooring and adhesive manufacturer per the manufacturer's directions.

3.3 INSTALLATION

- A. Install carpet tile in accordance with the manufacturer's instructions.
- B. Do not mix carpet from different cartons unless from same dye lot.
- C. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- D. Install carpet tile in square pattern, with pile direction alternating to next unit, set parallel to building lines and aligned as indicated on shop drawings.
- E. Locate change of color or pattern between rooms under door centerline.
- F. Fully adhere carpet tile to substrate.
- G. Adhere carpet tile with self-stick adhesive backing by removing protective membrane and pressing tile back onto clean and dry substrate.
- H. Trim carpet tile neatly at walls and around interruptions.
- I. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

- A. Division 01 - Execution Requirements: Final cleaning.
- B. Remove excess adhesive from floor, base, and wall surfaces without damage.
- C. Clean and vacuum carpet surfaces.

3.5 SCHEDULE

- A. See Room Finish Schedule.

END OF SECTION

SECTION 09 7720 - DECORATIVE FIBERGLASS REINFORCED WALL PANELS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Prefinished polyester glass reinforced plastic sheets.
 - 1. PVC trim.

1.2 REFERENCES

- A. American Society for Testing and Materials: Standard Specifications (ASTM)
 - 1. ASTM D 256 - Izod Impact Strengths (ft #/in)
 - 2. ASTM D 570 - Water Absorption (%)
 - 3. ASTM D 638 - Tensile Strengths (psi) & Tensile Modulus (psi)
 - 4. ASTM D 790 - Flexural Strengths (psi) & Flexural Modulus (psi)
 - 5. ASTM D 2583- Barcol Hardness
 - 6. ASTM D 5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels.
 - 7. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

- A. Product Data: Submit sufficient manufacturer's data to indicate compliance with these specifications, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- B. Shop Drawings: Submit elevations of each wall showing location of paneling and trim members with respect to all discontinuities in the wall elevation.
- C. Selection Samples: Submit manufacturer's standard color pattern selection samples representing manufacturer's full range of available colors and patterns.
- D. Samples for Verification: Submit appropriate section of panel for each finish selected indicating the color, texture, and pattern required.
 - 1. Submit complete with specified applied finish.
 - 2. For selected patterns show complete pattern repeat.
 - 3. Exposed Molding and Trim: Provide samples of each type, finish, and color.
- E. Manufacturers Material Safety Data Sheets (MSDS) for adhesives, sealants and other pertinent materials prior to their delivery to the site (available as downloads for most Marlite's products at <http://www.marlite.com/tech-details.aspx> or by contacting Marlite at info@marlite.com).

1.4 QUALITY ASSURANCE

- A. Conform to building code requirements for interior finish for smoke and flame spread requirements as tested in accordance with:
 - 1. ASTM E 84 (Method of test for surface burning characteristics of building Materials)
 - a. Wall Required Rating – Class A.
- B. Sanitary Standards: System components and finishes to comply with:
 - 1. United States Department of Agriculture (USDA) requirements for food preparation facilities, incidental contact.
 - 2. Food and Drug Administration (FDA) 1999 Food Code 6-101.11.
 - 3. Canadian Food Inspection Agency (CFIA) requirements.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials factory packaged on strong pallets.
- B. Store panels and trim lying flat, under cover and protected from the elements. Allow panels to acclimate to room temperature (range of 60 to 75°F) for 48 hours prior to installation.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Building are to be fully enclosed prior to installation with sufficient heat (70°) and ventilation consistent with good working conditions for finish work.
- B. During installation and for not less than 48 hours before, maintain an ambient temperature and relative humidity within limits required by type of adhesive used and recommendation of adhesive manufacturer.
 - 1. Provide ventilation to disperse fumes during application of adhesive as recommended by the adhesive manufacturer.

1.7 WARRANTY

- A. Furnish one year guarantee against defects in material and workmanship.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Marlite; 1 Marlite Drive, Dover, OH 44622. 800-377-1221 FAX (330) 343-4668 Email: info@marlite.com www.marlite.com.
- B. Product:
 - 1. Standard FRP

- C. Fiberglass reinforced thermosetting polyester resin panel sheets complying with ASTM D 5319.
 - 1. Coating: Multi-layer print, primer and finish coats or applied over-layer.
 - 2. Dimensions:
 - a. Thickness – 0.090" nominal
 - b. Width - 4'-0" nominal
 - 3. Tolerance:
 - a. Length and Width: +/-1/8"
 - b. Square - Not to exceed 1/8" for 8 foot panels or 5/32" for 10 foot panels
- D. Properties: Resistant to rot, corrosion, staining, denting, peeling, and splintering.
 - 1. Flexural Strength - 1.0×10^4 psi per ASTM D 790.
 - 2. Flexural Modulus - 3.1×10^5 psi per ASTM D 790.
 - 3. Tensile Strength - 7.0×10^3 psi per ASTM D 638.
 - 4. Tensile Modulus - 1.6×10^5 psi per ASTM D 638.
 - 5. Water Absorption - 0.72% per ASTM D 570.
 - 6. Barcol Hardness (scratch resistance) of 35 55 as per ASTM D 2583.
 - 7. Izod Impact Strength of 72 ft. lbs./in ASTM D 256
- E. Back Surface: Smooth. Imperfections which do not affect functional properties are not cause for rejection.
- F. Front Finish:
 - 1. Color: As selected by the Architect.
 - 2. Surface Marlite Standard FRP.
 - 3. Fire Rating Marlite FRP Class A (I).

2.2 MOLDINGS

- A. PVC Trim: Thin-wall semi-rigid extruded PVC.

2.3 ACCESSORIES

- A. Adhesive: Either of the following construction adhesives complying with ASTM C 557.
 - 1. Titebond Advanced Polymer Panel Adhesive – VOC compliant, non-flammable, environmentally safe adhesive.
- B. Sealant:
 - 1. Marlite Brand - Color Match Sealant.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Examine backup surfaces to determine that corners are plumb and straight, surfaces are smooth, uniform, clean and free from foreign matter, nails countersunk, joints and cracks filled flush and smooth with the adjoining surface.

1. Verify that stud spacing does not exceed 24" on-center.
- B. Repair defects prior to installation.
 1. Level wall surfaces to panel manufacturer's requirements. Remove protrusions and fill indentations.

3.2 INSTALLATION

- A. Comply with manufacturer's recommended procedures and installation sequence.
- B. Cut sheets to meet supports allowing 1/8" clearance for every 8 feet of panel.
 1. Cut and drill with carbide tipped saw blades or drill bits or cut with shears.
 2. Pre-drill fastener holes 1/8" oversize with high-speed drill bit.
 - a. Space at 8" maximum on center at perimeter, approximately 1" from panel edge.
 - b. Space at in field in rows 16' on center, with fasteners spaced at 12" maximum on center.
- C. Apply panels to board substrate, above base, vertically oriented with seams plumb and pattern aligned with adjoining panels.
 1. Install panels with manufacturer's recommended gap for panel field and corner joints.
 - a. Adhesive trowel and application method to conform to adhesive manufacturer's recommendations.
 - b. Drive fasteners for snug fit. Do not over-tighten.
- D. Apply panel moldings to all panel edges using silicone sealant providing for required clearances.
 1. All moldings must provide for a minimum 1/8" of panel expansion at joints and edges, to insure proper installation.
 2. Apply sealant to all moldings, channels and joints between the system and different materials to assure watertight installation.

3.3 CLEANING

- A. Remove excess sealant from panels and moldings. Wipe panel down using a damp cloth and mild soap solution or cleaner.
- B. Refer to manufacturer's specific cleaning recommendations Do not use abrasive cleaners.

END OF SECTION 09 7720

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and field application of paints and coatings as indicated.
- B. Work includes all painting and finishing of interior and exterior exposed items and surfaces, throughout project, except as otherwise indicated.
 - 1. Surface preparation, priming and coats of paint specified are in addition to shop-priming and surface treatment specified as work of other sections.
- C. Work includes field painting of exposed bare and covered pipes and ducts, and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.
- D. "Paint" as used herein means all coating systems materials including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as primer, intermediate or finish coats.
- E. Surfaces to be Painted: Except where natural finish of material is specifically noted as a surface not to be painted, paint exposed surfaces whether or not colors are designated in "schedules". Where items or surfaces are not specifically mentioned, paint the same as similar adjacent materials or areas. If color or finish is not designated, the Architect will select these from manufacturer's standard range of colors or finishes.
- F. Sheen to specific applications is as follows:
 - 1. Flat (0-10)
 - 2. Eggshell (10-20)
 - 3. Satin (20-40)
 - 4. Semi-Gloss (45-65)
 - 5. Gloss (75+)

1.2 RELATED WORK NOT INCLUDED

- A. Pre-finished Items: Unless otherwise indicated, do not include painting when factory finishing or Installer-finishing is specified for such items as (but not limited to) metal toilet partitions, pre-finished partition systems, acoustic materials, pre-finished casework, elevator entrance doors and frames, elevator equipment, and finished mechanical and electrical equipment, including light fixtures, switchgear and distribution cabinets.
- B. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts and elevator shafts.
- C. Finished Metal Surfaces: Unless otherwise indicated, metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting.

- D. Operating Parts: Unless otherwise indicated, moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts will not require finish painting.
- E. Shop Priming: Unless otherwise indicated, shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work and similar items.
- F. Do not paint over any code required labels, such as Underwriters' Laboratories and Factory Mutual, or any equipment identification, performance rating, name or nomenclature plates.

1.3 REFERENCES

- A. ASTM International:
 - 1. ASTM D16 - Standard Terminology Relating to Paint, Varnish, Lacquer, and Related Products.
 - 2. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials.
- B. Painting and Decorating Contractors of America:
 - 1. PDCA - Architectural Painting Specification Manual.
- C. SSPC: The Society for Protective Coatings:
 - 1. SSPC - Steel Structures Painting Manual.

1.4 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.5 SUBMITTALS

- A. Division 01 - Submittal Procedures: Submittal procedures.
- B. Product Data: Submit data on all finishing products.
- C. Samples:
 - 1. Submit two paper chip samples, illustrating range of colors and textures available for each surface finishing product scheduled.
 - 2. Submit two painted samples, illustrating selected colors and textures for each color and system selected with specified coats cascaded. Submit on, 8-1/2 x 11 inch in size.
- D. Manufacturer's Installation Instructions: Submit special surface preparation procedures, substrate conditions requiring special attention, and conditions.

1.6 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.7 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.8 MOCKUP

- A. Division 01 - Quality Requirements: Mock-up requirements.
- B. Construct mockup panel, 8 feet tall by 8 feet wide, illustrating coating color, texture, and finish.
- C. Locate where directed.
- D. Incorporate accepted mockup as part of Work.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside temperature ranges required by paint product manufacturer.
- B. Do not apply exterior coatings during rain or snow when relative humidity is outside humidity ranges, or moisture content of surfaces exceed those required by paint product manufacturer.
- C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.
- D. Minimum Application Temperature for Varnish and Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candle (860 lx) measured mid-height at substrate surface.

1.11 EXTRA MATERIALS

- A. Supply 2 gallons (8 L) of each color, type, and surface texture; store where directed.
- B. Label each container with color, type, texture, room locations, and in addition to manufacturer's label.

PART 2 PRODUCTS

2.1 PAINTS AND COATINGS

- A. Manufacturers:
 - 1. Benjamin Moore & Co.
 - 2. PPG Architectural Finishes, Inc.
 - 3. Sherwin-Williams.

2.2 COMPONENTS

- A. Coatings: Ready mixed, except field catalyzed coatings. Prepare coatings:
 - 1. To soft paste consistency, capable of being readily and uniformly dispersed to homogeneous coating.
 - 2. For good flow and brushing properties.
 - 3. Capable of drying or curing free of streaks or sags.
- B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve finishes specified; commercial quality.
- C. Patching Materials: Latex filler.
- D. Fastener Head Cover Materials: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify surfaces and substrate conditions are ready to receive Work as instructed by product manufacturer.
- B. Examine surfaces scheduled to be finished prior to commencement of work. Report conditions capable of affecting proper application.
- C. Test shop applied primer for compatibility with subsequent cover materials.
- D. Measure moisture content of surfaces using electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Wallboard: 12 percent.
 - 2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 - 3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
 - 5. Concrete Floors: 8 percent.

3.2 PREPARATION

- A. Surface Appurtenances: Remove electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
- B. Surfaces: Correct defects and clean surfaces capable of affecting work of this section. Remove or repair existing coatings exhibiting surface defects.

- C. Marks: Seal with shellac those which may bleed through surface finishes.
- D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
- E. Aluminum Surfaces Scheduled for Paint Finish: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
- F. Concrete Floors: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
- G. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.
- H. Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
- I. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
- J. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool wire brushing or sandblasting; clean by washing with solvent. Apply treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.
- K. Shop Primed Steel 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.
- L. Metal Doors Scheduled for Painting: Prime metal door top and bottom edge surfaces.

3.3 APPLICATION

- A. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- B. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless specified otherwise.
- C. Sand wood and metal surfaces lightly between coats to achieve required finish.
- D. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- E. Where clear finishes are required, tint fillers to match wood. Work fillers into grain before set. Wipe excess from surface.
- F. Prime concealed surfaces of interior and exterior woodwork with primer paint.

- G. Prime concealed surfaces of interior wood surfaces scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with thinner.
- H. Finishing Mechanical And Electrical Equipment:
 - 1. Paint shop primed equipment.
 - 2. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
 - 3. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, and except where items are shop finished.
 - 4. Paint interior surfaces of air ducts and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
 - 5. Paint exposed conduit and electrical equipment occurring in finished areas.
 - 6. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
 - 7. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
 - 8. Paint tanks, heat exchangers, ductwork and insulation, motors and accessories.

3.4 CLEANING

- A. Collect waste material which may constitute fire hazard, place in closed metal containers, and remove daily from site.

3.5 SCHEDULE - SHOP PRIMED ITEMS FOR SITE FINISHING

- A. Metal Fabrications (Section 05 50 00): Exposed surfaces of lintels, elevator pit ladders, access ladders, and handrails.

3.6 SCHEDULES OF PAINT PRODUCTS

- A. All paints and related products are to be the best in quality for each application designated. If technology and products have been developed or upgraded, the Contractor shall include in his original cost the best product from each manufacturer for the application specified. No cost increases will be accepted for failure to include the best in quality for each application.
- B. Existing Surfaces: The Contractor shall examine the existing surfaces of the project and include the proper primer in his original cost. No cost increases will be accepted for failure to examine existing surfaces and include the proper primer.

3.7 SCHEDULE - EXTERIOR SURFACES

- A. Concrete, Cement Plaster & Masonry other than concrete masonry units:
 - 1. One coat of block primer.
 - a. Sherwin Williams Loxon Masonry Primer A24 Series
 - 2. Two coats of latex or alkyd, flat.
 - a. Sherwin Williams A-100 Exterior Flat A6 Series
- B. Concrete Masonry Units:
 - 1. Filler coat:

2. Sherwin Williams Heavy Duty Blockfiller B42W46 Two coats of latex or alkyd, flat.
 - a. Sherwin Williams A-100 Exterior Latex Flat A6 Series
- C. Steel - Unprimed:
 1. One coat of latex or alkyd primer.
 - a. Sherwin Williams Pro Industrial Pro -Cryl Acrylic Primer B66 Series
 2. Two coats of alkyd or latex enamel, gloss.
 - a. Sherwin Williams Sher-Cryl High Performance Acrylic Coating B66 Series
- D. Steel - Shop Primed:
 1. Touch-up with Anti-Corrosive Primer
 2. Sherwin Williams Pro Industrial Pro-Cryl Acrylic Primer B66 Series Two coats of alkyd or latex enamel, gloss.
 - a. Sherwin Williams Sher-Cryl High Performance Acrylic Coating B66 Series
- E. Steel - Galvanized:
 1. One coat galvanize primer.
 - a. Sherwin Williams Pro Industrial Pro-Cryl Primer B66 Series
 2. Two coats of alkyd or latex enamel, gloss.
 - a. Sherwin Williams Sher-Cryl High Performance Acrylic Coating B66 Series

3.8 SCHEDULE - INTERIOR SURFACES

- A. Concrete, Cement Plaster or Masonry other than Concrete Masonry Units:
 1. One coat of primer sealer latex or alkyd.
 - a. Sherwin-Williams Loxon Concrete and Masonry Primer B28 Series
 2. Two coats of latex or alkyd satin.
 - a. Sherwin-Williams ProMar 200 Zero VOC Interior Latex Low Sheen B24-2600 Series
- B. Concrete Masonry Units:
 1. Filler coat:
 - a. Sherwin Williams Interior/Exterior Blockfiller B25W25
 2. Two coats of latex or alkyd, satin.
 - a. Sherwin Williams ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series
- C. Steel - Unprimed:
 1. One coat of alkyd or latex primer.
 - a. Sherwin Williams ProIndustrial Pro Cryl Primer B66 Series
 2. Two coats of alkyd or latex enamel, semi-gloss.
 - a. Sherwin Williams ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series
- D. Steel - Primed:
 1. Touch-up with alkyd or latex primer.
 - a. Sherwin Williams Pro Industrial Pro Cryl Primer B66 Series
 2. Two coats of alkyd or latex enamel, semi-gloss.

- a. Sherwin Williams ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series
- E. Steel - Galvanized:
 - 1. One coat galvanize primer.
 - a. Sherwin Williams Pro Industrial Pro Cryl Primer B66 Series
 - 2. Two coats of alkyd or latex enamel, semi-gloss.
 - a. Sherwin Williams ProMar 200 Zero VOC Interior Latex Semi-Gloss B31-2600 Series
- F. Gypsum Board and Plaster Walls and Ceilings:
 - 1. One coat of latex primer sealer.
 - a. Sherwin Williams Pro Green 200 Latex Primer B28W600
 - 2. Two coats of latex enamel, satin.
 - a. Sherwin Williams ProMar 200 Zero VOC Interior Latex Eg-Shel B20-2600 Series

3.9 SCHEDULE - COLORS

- A. See Room Finish Schedule.

END OF SECTION

JOHNSON COUNTY RECYCLING CENTER

SECTION 10 28 13

TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Toilet accessories.
- B. Attachment hardware.

1.2 REFERENCES

- A. ANSI A117.1 - Safety Standards for the Handicapped.
- B. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
- D. ASTM A269 - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
- E. ASTM A366 - Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.

1.3 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.

REGULATORY REQUIREMENTS

- A. Conform to ANSI A117.1 code and the Americans with Disabilities Act (ADA) for access for the handicapped.

1.5 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated.

1.6 COORDINATION

- A. Coordinate the work with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

JOHNSON COUNTY RECYCLING CENTER

- A. Bobrick Washroom Equipment, Inc.
- B. Or Architect Approved Equal Products.

2.2 MATERIALS

- A. Sheet Steel: ASTM A366.
- B. Stainless Steel Sheet: ASTM A167, Type 304.
- C. Tubing: ASTM A269, stainless steel.
- D. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 FABRICATION

- A. Weld and grind joints of fabricated components, smooth.
- B. Form exposed surfaces from single sheet of stock, free of joints. Form surfaces flat without distortion. Maintain surfaces without scratches or dents.
- C. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges. Form bar with 1-1/2 inches (75 mm) clear of wall surface. Knurl grip surfaces.
- D. Shop assemble components and package complete with anchors and fittings.
- E. Provide steel anchor plates, adapters, and anchor components for installation.

2.4 KEYING

- A. Supply 2 keys for each accessory to Owner.
- B. Master key all accessories.

2.5 FINISHES

- A. Chrome/Nickel Plating: ASTM B456, Type SC 2 satin finish.
- B. Stainless Steel: No. 4 satin luster finish.
- C. Back paint components where contact is made with building finishes to prevent electrolysis.

PART 3 - EXECUTION

3.1 EXAMINATION

JOHNSON COUNTY RECYCLING CENTER

- A. Verify that site conditions are ready to receive work and dimensions are as indicated on shop drawings.
- B. Verify exact location of accessories for installation.

3.2 PREPARATION

- A. Deliver inserts and rough-in frames to site for timely installation.
- B. Provide templates and rough-in measurements as required.

3.3 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions and ANSI A117.1.
- B. Install plumb and level, securely and rigidly anchored to substrate.

3.4 SCHEDULE (based on Bobrick)

- A. Grab Bars: B-6806 series.
- B. Mirrors: B-1658 series.
- C. Toilet Paper Dispensers: B-4288 Contura Series
- D. Paper Towel Dispensers: B-262 series.
- E. Soap Dispensers 818615 Contura Series
- F. Napkin Disposal B-270 Contura Series
- G. Shower Curtain Rods: B-6107 series
- H. Shower Curtains: 204-1 with 204-2
- I. Robe Hooks: B-6727
- J. Shower Seats: B-5191.

END OF SECTION

SECTION 10 44 00

SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes specialty signs.
- B. Forms of specialty signs required include the following:
 - 1. Room rooms signs.
 - 2. Exterior door signage.
 - 3. Aluminum plaque.

1.2 SUBMITTALS

- A. Section 01 33 00 - Submittal Procedures: Submittal procedures.
- B. Shop Drawings: Before preparation of shop drawings and schedules, the signage supplier shall meet with the Owner to review signage requirements. The signage supplier shall then prepare a complete sign schedule indicating sign styles, layout and content of each sign, lettering font, foreground and background colors, locations, overall dimensions of each sign.
- C. Samples: Submit two signs, full size illustrating type, style, letter font, and colors specified; method of attachment.
- D. Manufacturer's Installation Instructions: Submit installation template and attachment devices.

1.3 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.
- B. Package signs, labeled in name groups.
- C. Store adhesive attachment tape at ambient room temperatures.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.
- B. Do not install signs when ambient temperature is lower than recommended by manufacturer.
- C. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers of Signs:
 - 1. Green Signs.
 - 2. Ace.
 - 3. APCO Graphics.
 - 4. ACS Sign Systems.
 - 5. ASI Sign Systems.
 - 6. Essential Architectural Signs, Inc.
 - 7. Sign Solutions.
 - 8. Indianapolis Badge & Nameplate Company.
 - 9. Inpro.
- B. Manufacturers of Metal Letters and Plaques:
 - 1. A.R.K. Ramos.
 - 2. Andco Industries, Inc.
 - 3. Gemini Incorporated.
 - 4. OMC Industries.
 - 5. Leeds Aluminum Letters.
 - 6. Matthews.
 - 7. Metal Arts.
 - 8. Mills Manufacturing, Inc.
 - 9. Southwell Co. (The).

2.2 COMPONENTS

- A. Room Signs: Provide one (1) sign at each door as indicated on the Floor Plans and Door Schedule. Corridor doors to receive two (2) signs. The sign supplier shall meet with the Owner to finalize exact text to be provided on signs. Submit to the Architect for review. Signs shall be equal to ASI 390 Molded Plastic Frame with SPE plaque. Provide Men's and Women's Restroom Signs and other pictorial signs. All signs shall have information in braille.
 - 1. Text: two rows plus braille.
 - 2. 1 inch slot for inserts.
 - 3. Colors: Colors as selected by the Architect.

4. Total Thickness: 1/8 inch.
 5. Size: 6 inch wide x 8 inch tall.
- B. Exterior Door Signage: Provide two (2) signs at each exterior door. Signs shall be equal to ASI 390 Molded Plastic Frame with SPE plaque. All signs shall have information in braille.
1. Text: 10" tall large stroke numbers for exterior door identification as designated by the Owner.
 2. Colors: Colors as selected by the Architect.
 3. Total Thickness: 1/8 inch.
 4. Size: 12 inch wide x 12 inch tall.
- C. Aluminum Plaques:
1. Size: 18" x 24".
 2. Border: Double line.
 3. Background: Pebbled.
 4. Font: to be selected by the Architect from the manufacturer's standards.
 5. Mounting: Flush mount.
 6. Text: To be determined. Assume 200 letters and three logos.
 7. Location: As directed.
 8. Quantity: One.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verification of existing conditions before starting Work.

3.2 INSTALLATION

- A. Install signs after surfaces are finished, in locations scheduled.
- B. Install signs level, plumb and at heights required by applicable code.
- C. Wall Mounted Signs: Use manufacturer's standard brackets, fittings and hardware as appropriate for mounting signs.
- D. Metal Letters, Seals and Numbers: Mount letters and numbers using standard fastening methods recommended by the Manufacturer for letter form, type of mounting, indicated wall construction and condition of exposure. Provide heavy weight paper template to establish letter spacing and to locate holes for fasteners.
 1. Flush Mounting: Mount letters with backs in contact with wall surfaces.

3.3 CLEANING AND PROTECTION

- A. At completion of installation, clean soiled sign surface in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 10 44 13

FIRE EXTINGUISHERS AND CABINETS

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes fire protection cabinets, brackets and fire extinguishers.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For fire protection cabinets. Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 QUALITY ASSURANCE

- A. Coordinate size of fire protection cabinets to ensure that type and capacity of fire extinguishers indicated are accommodated.
- B. Coordinate sizes and locations of fire protection cabinets with wall depths.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aluminum: Alloy and temper recommended by aluminum producer and manufacturer for type of use and finish indicated, and as follows:
 - 1. Sheet: ASTM B 209.
 - 2. Extruded Shapes: ASTM B 221.
- B. Transparent Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), 3 mm thick, with Finish 1 (smooth or polished).

2.2 FIRE PROTECTION CABINET

- A. Cabinet Type: Suitable for fire extinguisher.
 - 1. Products:
 - a. Fire End & Croker Corporation;
 - b. J. L. Industries, Inc., a division of Activar Construction Products Group;
 - c. Kidde Residential and Commercial Division, Subsidiary of Kidde plc;
 - d. Larsen's Manufacturing Company;
 - e. Modern Metal Products, Division of Technico Inc.;

- f. Moon-American,;
 - g. Potter Roemer LLC,;
 - h. Watrous Division, American Specialties, Inc.,;
- B. Cabinet Material: Aluminum sheet.
 - C. Semirecessed Cabinet: Cabinet box partially recessed in walls of sufficient depth to suit style of trim indicated; with one-piece combination trim and perimeter door frame overlapping surrounding wall surface with exposed trim face and wall return at outer edge (backbend). Where walls are of insufficient depth for semi-recessed cabinets, provide surface mounted cabinets with fully exposed box and mounted directly on wall with no trim.
 - 1. Rolled-Edge Trim: 2-1/2-inch backbend depth.
 - D. Cabinet Trim Material: Same material and finish as door.
 - E. Door Material: Extruded-aluminum shapes.
 - F. Door Style: Vertical duo panel with frame.
 - G. Door Glazing: Acrylic sheet.
 - 1. Acrylic Sheet Color: Clear transparent acrylic sheet.
 - H. Door Hardware: Manufacturer's standard door-operating hardware of proper type for cabinet type, trim style, and door material and style indicated.
 - I. Accessories:
 - 1. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to fire protection cabinet, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - a. Identify fire extinguisher in fire protection cabinet with the words "FIRE EXTINGUISHER."
 - 1) Location: Applied to cabinet door.
 - 2) Application Process: Decals.
 - 3) Lettering Color: Red.
 - 4) Orientation: Vertical.
 - J. Finishes:
 - 1. Manufacturer's standard baked-enamel paint for the following:
 - a. Exterior of cabinet , door, and trim, except for those surfaces indicated to receive another finish.
 - b. Interior of cabinet and door.

2.3 FABRICATION

- A. Fire Protection Cabinets: Provide manufacturer's standard box (tub), with trim, frame, door, and hardware to suit cabinet type, trim style, and door style indicated. Miter and weld joints and grind smooth.

2.4 FIRE EXTINGUISHERS

- A. Multipurpose Dry-Chemical Type: UL-rated 4A:80B:C 10 lb.nominal capacity, with monoammonium phosphate-based dry chemical in manufacturer's standard enameled container.
- B. Provide 6 liter Class K Fire Extinguishers in kitchens.

2.5 BRACKETS FOR WALL MOUNTED EXTINGUISHERS

- A. Mounting Bracket: Manufacturer's standard steel, designed to secure fire extinguisher to wall surface, of sizes required for types and capacities of fire extinguishers indicated, with plated or baked-enamel finish.
 - 1. Identify fire extinguisher on bracket with the words "FIRE EXTINGUISHER."
 - a. Location: Applied to wall.
 - b. Application Process: Decals.
 - c. Lettering Color: Red.
 - d. Orientation: Vertical.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Examine walls and partitions for suitable framing depth and blocking where semirecessed cabinets will be installed and prepare recesses as required by type and size of cabinet and trim style.
- B. Install fire protection cabinets in locations and at mounting heights indicated
- C. Fire Protection Cabinets: Fasten cabinets to structure, square and plumb.
- D. Identification: Apply decals at locations indicated.
- E. Adjust fire protection cabinet doors to operate easily without binding. Verify that integral locking devices operate properly.
- F. Replace fire protection cabinets that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION

**SECTION 10 51 15
STANDARD METAL LOCKERS**

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Lockers configured:
 - a. Double Tier
 - 2. Wood Benches.
 - 3. Provide fasteners and anchorage devices to install lockers provided under this section.
 - 4. Provide metal filler panels to fill between banks of lockers and adjacent construction.

1.03 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of locker and bench.
- B. Shop Drawings: Show lockers in detail, method of installation, fillers, trim, base and accessories. Include locker numbering sequence information.
- C. Samples for verification: Submit manufacturer's technical data and installation instructions for metal locker units.
- D. Maintenance Data: For adjusting, repairing, and replacing locker doors and latching mechanisms to include in maintenance manuals specified in Division 1.

1.04 QUALITY ASSURANCE

- A. Uniformity and Single Manufacturer Requirements: Provide each type of metal locker as produced by a single manufacturer, including necessary mounting accessories, fittings, and fastenings.
- B. Installers Qualifications: Lockers to be installed by an experienced agent of the manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Packing and Shipping: Do not deliver metal lockers until building is enclosed and ready for locker installation.
- B. Storage and Protection: Protect materials from damage during delivery, handling, storage, and installation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:** Subject to compliance with requirements of the Contract Documents, acceptable manufacturers are as follows:
1. Penco Products
 2. Lyon
 3. AJW Architectural Products.

2.02 FABRICATION

- A. Locker Construction**
1. Equal to Penco Vanguard, knock-down lockers.
 2. Tops, Bottoms, Backs, Sides and Shelves: 24 gauge sheet steel.
 3. Doors: 16 gauge sheet steel. Louvered. Multi-point latching.
 4. Provide hasps for padlocks.
 5. Provide ADA compliant lockers in several different locations of banks of lockers.
 6. Continuous base.
- B. Hinges:**
1. Hinges to be 3 inch, five knuckle, 14 gauge heavy-duty fast pin.
 2. Locker doors 42 inches high or less shall have 2 hinges.
 3. Doors over 42 inches shall have 3 hinges.
- C. Slope Tops:**
1. Provide 18 gauge all welded slope top with 25 degree pitch, attached at factory with concealed fasteners. Slope top to be in addition to standard 16 gauge flat top.
- G. Closed Bases:**
1. 4 inch high, 14 gauge welded steel base enclosed on all four sides securely welded to locker bottom.
- J. Filler Panels:** Manufacturer's standard fabricated from 18 gauge solid steel finished to match lockers. Provide slip joint fillers angle formed to receive filler panel.
- K. Finish:**
1. Complete locker unit to be thoroughly cleaned, phosphatized and sealed.
 2. Finish to be baked pure TGIC polyester powder coat with a minimum 2-3 mil thickness.
 3. Color of lockers shall be chosen from manufacturer's standard colors.

2.03 LOCKER ACCESSORIES

- A. Interior Equipment:** Furnish each locker with the following items, unless otherwise indicated:
1. Hooks:
 - a. Hooks to be heavy-duty forged steel with ball ends and zinc plated.

- b. Provide two single wall hooks and one double ceiling hook in each locker opening 20 inches or taller.
2. Numbering:
 - a. Finish each locker with polished aluminum number plate with etched black numbers.
 - b. Locate number plate near center of each door.
 - c. Owner to furnish numbering sequence.

2.04 WOOD BENCHES

- A. Provide heavy duty wood benches on heavy duty pedestals.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Wall Installation

1. Securely anchor every locker to wall and/or floor before use. Installation hardware to be determined based upon wall/floor construction.
2. Tie adjacent locker units by bolting at four points, two at top and two at bottom, using ¼ inch cadmium plated bolts.

B. Island Installation:

1. Securely anchor every locker to floor or base before use. Installation hardware to be determined based upon wall/floor construction.
2. Tie adjacent locker units together by bolting at four points, two at top and two at bottom, using ¼ inch cadmium plated bolts.
3. Tie back-to-back locker units together with ¼ inch cadmium plated bolts and washers.

3.02 ADJUSTING

- A. General Requirements: Upon completion of installation, inspect lockers and adjust for proper door and locking mechanism operation.

3.03 CLEANING

A. General Requirements:

1. Clean interior and exposed exterior surfaces, removing debris, dust, dirt and foreign substances on exposed surfaces.
2. Touch up scratches and abrasions to match original finish.
3. Polish stainless steel and non-ferrous metal surfaces.
4. Replace locker units that cannot be restored to factory-finished appearance.
5. Use only materials and procedures recommended by locker manufacturer.

SECTION 10 9900 - APPLIANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes refrigerators.

1.2 SUBMITTALS

- A. Product Data: For each type of specialty indicated.

PART 2 - PRODUCTS

2.1 REFRIGERATORS

- A. Provide Frigidaire 25.6 Cu. Ft. Stainless Steel Side by Side Model # FRSS2623AS.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow manufacturer's instructions.

END OF SECTION 10 9900

SECTION 11 13 00 – LOADING DOCK EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
 - 1. Levelers.
 - 2. Dock Seals.
 - 3. Shelters.

1.2 SUBMITTALS

- A. Product data. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:
- B. Operating And Maintenance Manuals Submittals:

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Dock Levelers: Provide Kelley Hydraulic dock levelers. Provide HP series hydraulic dock leveler with standard 16 inch up, automatic retracting structural support legs, heavy duty dock bumpers, Nema 4X Push button control panel.
- B. Shelters: Provide Kelley Flexframe Dock shelters with 40 vinyl flame retardant fabric.
- C. Seals: Provide Kelley DSS Stationary Head Pad Dock Seals.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for alignment of mounting substrates, installation tolerances, operational clearances, accurate locations of connections to building electrical system, and other conditions affecting performance.
 - 1. Verify critical dimensions.
 - 2. Examine supporting structure and below finished floor for subgrades, subfloors and footings.
 - 3. Examine wall assemblies, where reinforced to receive anchors and fasteners, to verify that locations of concealed reinforcements have been clearly marked for installers. Locate reinforcements and mark locations if not already done.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

1.2 INSTALLATION, GENERAL

- A. General: Comply with manufacturer's written installation instructions.

END OF SECTION

JOHNSON COUNTY RECYCLING CENTER

SECTION 12 24 13
WINDOW SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Manually operated, roll-up fabric interior window shades including mounting and operating hardware.

1.2 REFERENCES

- A. NFPA 70 - National Electrical Code.
- B. NFPA 701-99 - Fire Tests for Flame-Resistant Textiles and Films.
- C. GREENGUARD Environmental Institute Children & Schools.
- D. US Green Building Council.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 33 26 - Source Quality Control Reporting:
- B. Product Data: Manufacturer's data sheets on each product specified, including:
 - 1. Preparation instructions and recommendations.
 - 2. Installation and maintenance instructions.
 - 3. Styles, material descriptions, dimensions of individual components, profiles, features, finishes and operating instructions.
 - 4. Storage and handling requirements and recommendations.
 - 5. Mounting details and installation methods.
 - 6. Typical wiring diagrams including integration of motor controllers with building management system, audiovisual and lighting control systems as applicable.
- C. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
- D. LEED Submittals: Provide documentation of how the requirements of Credit will be met.
- E. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings, field verified window dimensions, quantities, type of shade, controls, fabric, and color, and include opening sizes and key to typical mounting details.
- F. Selection Samples: For each finish product specified, two complete sets of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.

- G. Verification Samples: For each finish product specified, two complete sets of shade components, unassembled, demonstrating compliance with specified requirements. Shade fabric sample and aluminum finish sample as selected, representing actual product, color, and patterns. Mark face of material to indicate interior faces.
- H. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.
- I. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years experience in manufacturing products comparable to those specified in this section.
- B. NFPA Flame-Test: Passes NFPA 701. Materials tested shall be identical to products proposed for use.
- C. Mock-Up: Provide a mock-up of one of each type roller shade assembly specified for evaluation of mounting, appearance and accessories.
 - 1. Locate mock-up in window(s) designated by Architect.
 - 2. Do not proceed with remaining work until mock-up is accepted by Architect.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.
- B. Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.
- C. Label containers and shades according to Window Shade Schedule.
- D. Store products in manufacturer's unopened packaging until ready for installation.

1.6 SEQUENCING

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.7 PROJECT CONDITIONS

- A. Install roller shades after finish work and ambient temperature, humidity and ventilation conditions are maintained at levels recommended for project upon completion.

1.8 WARRANTY

- A. Hardware and Shade Fabric: Draper's standard twenty-five year limited warranty.
- B. Motors and Controls: Draper's standard five year limited warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Draper, Inc., which is located at: 411 S. Pearl P. O. Box 425 ; Spiceland, IN 47385-0425; Toll Free Tel: 800-238-7999; Tel: 765-987-7999; Email:[request info](mailto:requestinfo); Web:www.draperinc.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

2.2 MANUALLY OPERATED WINDOW SHADES

- A. Manually Operated Window Shades with Independent Control: Manually operated, vertical roll-up, fabric window shade with components necessary for complete installation; Manual FlexShade as manufactured by Draper, Inc.
 - 1. Operation: Bead chain and clutch operating mechanism allowing shade to stop when chain is released. Designed never to need adjustment or lubrication. Provide limit stops to prevent shade from being raised or lowered too far.
 - a. Clutch mechanism: Fabricated from high carbon steel and molded fiberglass reinforced polyester or injected molded nylon. White or Black color as selected by Architect.
 - b. Bead chain loop: Stainless steel bead chain hanging at side of window.
 - c. Idler Assembly: Provide roller idler assembly of molded nylon with adjustable or spring-loaded length idler pin to facilitate easy installation, and removal of shade for service.
 - d. Bead Chain Hold Down: P-Clip (standard).
 - 2. Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.
 - 3. Shade slat: Slat encased in heat seamed hem.
 - 4. Mounting:
 - a. Endcaps and fascia.
 - 5. Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.
 - 6. Fascia: L shaped aluminum extrusion to conceal shade roller and hardware.
 - a. Attachment: Snaps onto endcaps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands. No notching is required.
 - b. Shape: Square Fascia Panel.
 - c. Finish: Clear anodized.

2.3 FABRIC

A. Light-Filtering Fabrics

1. SheerWeave - Basic by Phifer. An economical alternative to traditional solar screen fabrics. Fire Rating: California U.S. Title 19 (small scale), NFPA 701-2004 TM#1 (small scale), NFPA 101 (Class A Rating), UBC (Class I), BS 5867 2008 Part 2 Type B Performance, CAN/ULC-S109-03 (large and small scale) and NFPA 701 TM#2 (large scale), GREENGUARD, Microban. Average 3 percent Openness. Average Fabric Thickness: .025 inch. Average Fabric Weight: 16.4 ounces per square yard. Average 5 percent Openness. Average Fabric Thickness: 0.022 inch. Average Fabric Weight: 14.1 ounces per square yard.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Coordinate requirements for blocking and structural supports to ensure adequate means for installation of window shades.
- B. Coordinate requirements for power supply conduit, and wiring required for window shade motors and controls.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install roller shades level, plumb, square, and true. Allow proper clearances for window operation hardware.
- C. Install the following items to conceal roller and operating mechanism. Do not use exposed fasteners.
 1. Fascias.

3.4 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.5 SCHEDULES

- A. Refer to Drawings for shade types and locations.

END OF SECTION

SECTION 12 32 16

PLASTIC LAMINATE CASEWORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Cabinets and counter tops.
- B. Casework hardware.

1.2 REFERENCES

- A. Countertop Standard: ANSI A161.2
- B. Catalog Standards: Manufacturer's catalog numbers may be shown on drawings or in equipment schedule for convenience in identifying certain cabinet work. Unless modified by notation on drawings or otherwise specified, catalog description for indicated number constitutes requirements for each such cabinet.

1.3 SUBMITTALS

- A. Submit under provisions of Division 01.
- B. Shop Drawings: Indicate casework locations, large scale plans, elevations, rough-in and anchor placement dimensions and tolerances, clearances required.
- C. Product Data: Provide component dimensions, configurations, construction details and joint details.
- D. Samples: Submit two samples, minimum size 3 x 6 inches (75 x 150 mm) of each color of finish.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSI 161.1.

1.5 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.6 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Stevens Cabinet Company, Inc. Product Architectural Designer Series.
- B. L.S.I. Corp. of America, Inc.
- C. Trimline Product.
- D. Case Systems.
- E. Advanced Cabinet Systems
- F. Custom fabricated per enclosed specifications.

2.2 BASIC MATERIALS

- A. Particleboard: ANSI A208.1 mat-formed particleboard, Grade 1-M-2 with minimum density of 40 lbs. per cu. ft., internal bond of 60 psi; and minimum screw holding capacity of 225 lbs. on faces and 200 lbs. on edges.
- B. Plastic Laminate: NEMA LD-3, of thickness, type and grade designation indicated; in colors or patterns and finishes indicated or, if not indicated, as selected by Architect from manufacturer's standard range.
- C. Exposed Surfacing Material of Doors, Drawer Fronts, Fixed Panels, Toeboards and Ends: High pressure decorative laminate, 0.028" thick, General Purpose Type (GP-28).
- D. Semi-Exposed Surfacing Material and Doors: High pressure plastic laminate, 0.020" thick, Cabinet Liner Type (CL-20), in color or pattern and finish matching interior of cabinets, unless otherwise indicated.
- E. Remaining Semi-Exposed Materials: Decorative boards, General Purpose Type, conforming to NEMA LQ-1 with decorative faces in patterns or colors and finish indicated or, if not indicated, as selected by Architect from manufacturer's standard range.

- F. Concealed Materials: Any sound, dry solid lumber, plywood or particleboard or combination thereof; without defects affecting strength, utility or stability. On concealed surfaces of portions constructed of decorative boards, provide decorative or cabinet liner laminate backing (Light-Duty Type).
- G. Core Material for Plastic Laminates: Industrial Grade Particleboard conforming to ANSI A20B.1, Grade 1-M-2.
- H. Treatment of Exposed and Semi-Exposed Edges: Edges of doors and drawer fronts shall have 3mm PVC of a coordinating color.
- I. Cabinet Construction
 - 1. Sides, dividers, tops, bottoms, shelves and stretchers: Not less than 1/2" thick. Provide stretchers at top of base cabinet.
 - 2. Backs: Not less than 3/8" thick for unexposed backs. Exposed backs are to be 3/4" thick panels of balanced construction tenoned into cabinet ends.
 - 3. Drawers
 - a. Sides, subfronts and backs: not less than 1/2" thick.
 - b. bottoms: not less than 1/4" thick particleboard or provide solid wood sides and back.
 - c. Provide box type construction with front, bottom and back rabbeted in sides.
 - d. All joints secured with glue and mechanical fasteners.
 - e. All drawers must be suspended on extension drawer slides.
 - 4. Joinery
 - a. Rabbet backs flush into end panels and secure with concealed mechanical fasteners.
 - b. Connect wall cabinet tops and bottoms and base cabinet bottoms and stretchers to ends and dividers by means of mechanical fasteners.
 - c. Rabbet tops, bottoms and backs into end panels or cabinetry corner joints to incorporate fluted dowel pin construction.
 - 5. Subbase: Not less than 3/4" thick, of height and relationship to cabinet fronts and exposed ends as indicated. Rubber base furnished and applied continuously per Section 09650.
 - 6. Toe Board: Not less than 3/4" thick, attached to subbase with concealed fasteners.

2.3 COUNTERTOPS

- A. Solid Surface Material.
- B. Countertop Configuration: Provide self-edge countertops with continuous 4" backsplash.
- C. Countertop Thickness: As indicated or, if not indicated, not less than 1" thick at edges.

2.4 CABINET AND CASEWORK HARDWARE AND ACCESSORIES

- A. General: Provide manufacturer's standard hardware and accessory units of type, size and finish indicated, complying with ANSI A156.9 or, if not indicated, as selected by Architect from manufacturer's standard range.
- B. Hinge: Institutional type, 5 knuckle with 270 degree swing. Provide one pair for doors less than 4 ft. high and 1-1/2 pair for doors over 4 ft.
- C. Pulls: Selected from manufacturer's standard. Provide 2 pulls for drawers over 24" wide.
- D. Door Catches: Nylon roller spring catch or dual self-aligning permanent magnet type. Provide 2 catches on doors over 4 ft. high.
- E. Drawer Slides: Steel slides with ballbearing nylon rollers. 100# rating. File drawers shall have full extension drawer slides for full access to drawer.
- F. Drawer and Cupboard Locks: Provide locks for all casework doors and drawers. Half-mortise type, 5-disc tumbler and dead bolt, round cylinder only exposed, die cast with plated finish.
 - 1. Key each cabinet in room alike.
 - 2. Key each room differently.
 - 3. Provide one master key.
 - 4. Provide two keys each.
- G. Sliding Glass Door Hardware Sets: Manufacturer's standard to suit type and size of sliding door units.

- H. Shelf Support Clips: One-piece molded nylon.
- I. Sinks and Faucets: As specified in Division 22.
- J. Finish: Unless otherwise indicated, provide hardware units with manufacturer's standard, satin finish.

2.5 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.
- C. Fabricate each unit rigid, not dependent on building structure adjacent units for rigidity.
- D. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
- E. Form edges smooth. Form material for counter tops, facing, shelves, and linings from continuous sheets.
- F. Provide cutouts for plumbing fixtures, appliances, fixtures and fittings. Prime paint contact surfaces of cut edges.
- G. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.6 FINISHES

- A. Exposed To View Surfaces: Plastic Laminate of color and pattern as selected.
- B. Interior Surfaces Not Exposed to View: Standard white melamine.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions.

- B. Verify adequacy of support framing.

3.2 INSTALLATION

- A. Install casework, components and accessories in accordance with manufacturer's instructions.
- B. Use anchoring devices to suit conditions and substrate materials encountered.
- C. Set casework items plumb and square, securely anchored to building structure.
- D. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Use filler strips not additional overlay trim for this purpose.
- E. Close ends of units, back splashes, shelves and bases.
- F. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

3.3 ADJUSTING

- A. Adjust work under provisions of Division 01.
- B. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly.

3.4 CLEANING

- A. Clean work under provisions of Division 01.
- B. Clean casework, counters, shelves and hardware.

3.5 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Division 01.
- B. Do not permit finished casework to be exposed to continued construction activity.

3.6 SCHEDULES

- A. See Plans and Details.

JOHNSON COUNTY RECYCLING CENTER

END OF SECTION

SECTION 13 34 19

METAL BUILDING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes Metal Building Systems (PEMB) including but not limited to the following:
 - 1. Structural-steel framing.
 - 2. Metal roof panels installed on metal and wood framing systems.
 - 3. Metal wall panels installed on metal and wood framing systems.
 - 4. Metal soffit panels at metal building roof edge.
 - 5. Metal rake trim at metal building roof edge.
 - 6. Thermal insulation.
 - 7. Roof drainage systems provided at metal building and remainder of building roof edges.
 - 8. Underlayment for metal roof panels installed over wood sheathing.
 - 9. Canopies.
 - 10. Snow guards.
 - 11. Building wrap.
 - 12. Accessories.

1.3 DEFINITIONS

- A. Terminology Standard: See MBMA's "Metal Building Systems Manual" for definitions of terms for metal building system construction not otherwise defined in this Section or in standards referenced by this Section.
- B. Drawings denote materials that are part of this section with the abbreviation "PEMB".

1.4 COORDINATION

- A. Coordinate sizes and locations of concrete foundations and casting of anchor-rod inserts into foundation walls and footings. Anchor rod installation, concrete, reinforcement, and formwork requirements are specified in Section 033000 "Cast-in-Place Concrete."
- B. Coordinate metal panel assemblies with rain drainage work, flashing, trim, and construction of supports and other adjoining work to provide a leakproof, secure, and noncorrosive installation.

- C. Construction included in this section includes roof panels, interior wall liner panels, gutters and downspouts required to complete project beyond that required for metal building portion. Coordinate design, shop drawings, delivery of and installation of Work beyond metal building with other trades as needed to provide complete and weather tight assemblies compliant with the Indiana Building Code and the requirements of the documents.

1.5 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.
 - 1. Review methods and procedures related to metal building systems including, but not limited to, the following:
 - a. Condition of foundations and other preparatory work performed by other trades.
 - b. Structural load limitations.
 - c. Construction schedule. Verify availability of materials and erector's personnel, equipment, and facilities needed to make progress and avoid delays.
 - d. Required tests, inspections, and certifications.
 - e. Unfavorable weather and forecasted weather conditions and impact on construction schedule.
 - 2. Review methods and procedures related to metal roof panel assemblies including, but not limited to, the following:
 - a. Compliance with requirements for purlin and rafter conditions, including flatness and attachment to structural members.
 - b. Structural limitations of purlins and rafters during and after roofing.
 - c. Flashings, special roof details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect metal roof panels.
 - d. Temporary protection requirements for metal roof panel assembly during and after installation.
 - e. Roof observation and repair after metal roof panel installation.
 - 3. Review methods and procedures related to metal wall liner panel assemblies including, but not limited to, the following:
 - a. Compliance with requirements for support conditions, including alignment between and attachment to structural members.
 - b. Structural limitations of girts and columns during and after wall panel installation.
 - c. Wall liner penetrations, openings, and condition of other construction that will affect metal wall panels.
 - d. Temporary protection requirements for metal wall liner panel assembly during and after installation.
 - e. Wall observation and repair after metal wall liner panel installation.

1.6 ACTION SUBMITTALS

- A. Product Data: For each type of metal building system component.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for the following:
 - a. Metal roof panels.
 - b. Metal wall liners.
 - c. Metal soffit panels.
 - d. Thermal insulation and vapor-retarder facings.

- B. Shop Drawings: Indicate components by others. Include full building plan, elevations, sections, details and the following:
 1. Anchor-Rod Plans: Submit anchor-rod plans and templates before foundation work begins. Include location, diameter, and minimum required projection of anchor rods required to attach metal building to foundation. Indicate column reactions at each location.
 2. Structural-Framing Drawings: Show complete fabrication of primary and secondary framing; include provisions for openings. Indicate welds and bolted connections, distinguishing between shop and field applications. Include transverse cross-sections.
 3. Metal Roof and Wall Liner Layout Drawings: Show layouts of panels including methods of support. Include details of edge conditions, joints, panel profiles, corners, anchorages, clip spacing, trim, flashings, closures, and special details. Distinguish between factory- and field-assembled work; show locations of exposed fasteners.
 - a. Show wall-mounted items including personnel doors, vehicular doors, windows, louvers, and lighting fixtures.
 4. Accessory Drawings: Include details of the following items, at a scale of not less than 1-1/2 inches per 12 inches (1:8):
 - a. Flashing and trim.
 - b. Gutters.
 - c. Downspouts.

- C. Samples for Initial Selection: For units with factory-applied finishes.

- D. Samples for Verification: For the following products:
 1. Panels: Nominal 12 inches long by actual panel width. Include fasteners, closures, and other exposed panel accessories.
 2. Flashing and Trim: Nominal 12 inches long. Include fasteners and other exposed accessories.
 3. Vapor-Retarder Facings: Nominal 6-inch square Samples.
 4. Accessories: Nominal 12-inch long Samples for each type of accessory.

- E. Delegated-Design Submittal: For metal building systems.
 1. Include analysis data indicating compliance with performance requirements and design data signed and sealed by the qualified professional engineer, registered in the State of Indiana, responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For erector and manufacturer.
- B. Welding certificates.
- C. Letter of Design Certification: Signed and sealed by a qualified professional engineer registered in the State of Indiana. Include the following:
 - 1. Name and location of Project.
 - 2. Order number.
 - 3. Name of manufacturer.
 - 4. Name of Contractor.
 - 5. Building dimensions including width, length, height, and roof slope.
 - 6. Indicate compliance with AISC standards for hot-rolled steel and AISI standards for cold-rolled steel, including edition dates of each standard.
 - 7. Governing building code and year of edition (2014 Indiana Building Code).
 - 8. Design Loads: Include dead load, roof live load, collateral loads, roof snow load, deflection, wind loads/speeds and exposure, seismic design category or effective peak velocity-related acceleration/peak acceleration, and auxiliary loads (cranes).
 - 9. Load Combinations: Indicate that loads were applied acting simultaneously with concentrated loads, according to governing building code.
 - 10. Building-Use Category: Indicate category of building use and its effect on load importance factors.
- D. Erector Certificates: For qualified erector, from manufacturer.
- E. Material Test Reports: For each of the following products:
 - 1. Structural steel including chemical and physical properties.
 - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 - 3. Tension-control, high-strength, bolt-nut-washer assemblies.
 - 4. Shop primers.
 - 5. Nonshrink grout.
- F. Source quality-control reports.
- G. Field quality-control reports.
- H. Sample Warranties: For special warranties.

1.8 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For metal panel finishes to include in maintenance manuals.

1.9 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer.

1. Accreditation: Manufacturer's facility accredited according to the International Accreditation Service's AC472, "Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems."
 2. Engineering Responsibility: Preparation of comprehensive engineering analysis and Shop Drawings by a professional engineer who is legally qualified to practice in jurisdiction where Project is located.
- B. Erector Qualifications: An experienced erector who specializes in erecting and installing work similar in material, design, and extent to that indicated for this Project and who is acceptable to manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
- 1.10 DELIVERY, STORAGE, AND HANDLING
- A. Deliver components, sheets, panels, and other manufactured items so as not to be damaged or deformed. Package metal panels for protection during transportation and handling.
- B. Unload, store, and erect metal panels in a manner to prevent bending, warping, twisting, and surface damage.
- C. Stack metal panels horizontally on platforms or pallets, covered with suitable weathertight and ventilated covering. Store metal panels to ensure dryness, with positive slope for drainage of water. Do not store metal panels in contact with other materials that might cause staining, denting, or other surface damage.
- 1.11 FIELD CONDITIONS
- A. Weather Limitations: Proceed with panel installation only when weather conditions permit metal panels to be installed according to manufacturers' written instructions and warranty requirements.
- 1.12 WARRANTY
- A. Special Warranty on Metal Panel Finishes: Manufacturer agrees to repair finish or replace metal panels that show evidence of deterioration of factory-applied finishes within specified warranty period.
1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 2. Finish Warranty Period: 20 years from date of Substantial Completion.

- B. Special Weathertightness Warranty for Standing-Seam Metal Roof Panels: Manufacturer agrees to repair or replace standing-seam metal roof panel assemblies that leak or otherwise fail to remain weathertight within specified warranty period.
 - 1. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain metal building system components, including primary and secondary framing and metal panel assemblies, from single source from single manufacturer.

2.2 SYSTEM DESCRIPTION

- A. Provide a complete, integrated set of mutually dependent components and assemblies that form a metal building system capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior.
- B. Primary-Frame Type:
 - 1. Rigid Clear Span: Solid-member, structural-framing system without interior columns.
- C. End-Wall Framing: Manufacturer's standard, for buildings not required to be expandable, consisting of load-bearing end-wall and corner columns and rafters.
- D. Secondary-Frame Type: Manufacturer's standard purlins and partially inset-framed girts.
- E. Eave Height: 24 feet.
- F. Bay Spacing: As indicated on Drawings.
- G. Roof Slope: See Drawings.
- H. Roof System: Manufacturer's standing-seam, vertical-rib, metal roof panels.
- I. Exterior Wall System: As indicated on drawings.

2.3 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer registered in the State in the Indiana, to design metal building system.
- B. Structural Performance: Metal building systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated according to procedures in MBMA's "Metal Building Systems Manual."

1. Design Loads: As indicated on Drawings.
 2. Deflection and Drift Limits: As indicated on Drawings.
- C. Seismic Performance: Metal building system shall withstand the effects of earthquake motions determined according to ASCE/SEI 7 and in accordance with design criteria indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.
- E. Structural Performance for Metal Roof : Provide metal panel systems capable of withstanding the effects of the following loads, based on testing according to ASTM E 1592:
1. Wind Loads: As indicated on Drawings.
- F. Air Infiltration for Metal Roof Panels: Air leakage of not more than 0.06 cfm/sq. ft. when tested according to ASTM E 1680 or ASTM E 283 at the following test-pressure difference:
1. Test-Pressure Difference: 6.24 lbf/sq. ft.
- G. Water Penetration for Metal Roof Panels: No water penetration when tested according to ASTM E 1646 or ASTM E 331 at the following test-pressure difference:
1. Test-Pressure Difference: 6.24 lbf/sq. ft.
- H. Wind-Uplift Resistance: Provide metal roof panel assemblies that comply with UL 580 for wind-uplift-resistance class indicated.
1. Field Uplift Rating: UL 90.
 2. Perimeter Uplift Rating: 135 pounds per square foot.
 3. Corner Uplift Rating: 210 pounds per square foot.
- I. Thermal Performance for Opaque Elements: Provide the following maximum U-factors and minimum R-values when tested according to ASTM C 1363 or ASTM C 518:
1. Roof:
 - a. Assembly U-Factor: 0.065.
 - b. Insulation R-Value: 19.

2.4 STRUCTURAL-STEEL FRAMING

- A. Structural Steel: Comply with AISC 360, "Specification for Structural Steel Buildings."
- B. Bolted Connections: Comply with RCSC's "Specification for Structural Joints Using High-Strength Bolts."

- C. Cold-Formed Steel: Comply with AISI's "North American Specification for the Design of Cold-Formed Steel Structural Members" for design requirements and allowable stresses.
- D. Primary Framing: Manufacturer's standard primary-framing system, designed to withstand required loads and specified requirements. Primary framing includes transverse and lean-to frames; rafters, rake, and canopy beams; sidewall, intermediate, end-wall, and corner columns; and wind bracing.
 - 1. General: Provide frames with attachment plates, bearing plates, and splice members. Factory drill for field-bolted assembly. Provide frame span and spacing indicated.
 - a. Slight variations in span and spacing may be acceptable if necessary to comply with manufacturer's standard, as approved by Architect.
 - 2. Rigid Clear-Span Frames: I-shaped frame sections fabricated from shop-welded, built-up steel plates or structural-steel shapes. Interior columns are not permitted.
 - 3. Frame Configuration: Single gable.
 - 4. Exterior Column: Tapered.
 - 5. Rafter: Tapered.
- E. End-Wall Framing: Manufacturer's standard primary end-wall framing fabricated for field-bolted assembly to comply with the following:
 - 1. End-Wall and Corner Columns: I-shaped sections fabricated from structural-steel shapes; shop-welded, built-up steel plates; or C-shaped, cold-formed, structural-steel sheet.
 - 2. End-Wall Rafters: C-shaped, cold-formed, structural-steel sheet; or I-shaped sections fabricated from shop-welded, built-up steel plates or structural-steel shapes.
- F. Secondary Framing: Manufacturer's standard secondary framing, including purlins, girts, eave struts, flange bracing, base members, gable angles, clips, headers, jambs, and other miscellaneous structural members. Unless otherwise indicated, fabricate framing from roll-formed, metallic-coated steel sheet, to comply with the following:
 - 1. Purlins: C- or Z-shaped sections; fabricated from built-up galvanized steel plates or metallic-coated steel sheet; minimum 2-1/2-inch wide flanges.
 - a. Depth: As indicated on Drawings and as needed to comply with system performance requirements.
 - 2. Girts: C- or Z-shaped sections; fabricated from metallic-coated steel sheet. Form ends of Z-sections with stiffening lips angled 40 to 50 degrees from flange, with minimum 2-1/2-inch-wide flanges.
 - a. Depth: As indicated on Drawings and as required to comply with system performance requirements.
 - 3. Eave Struts: Unequal-flange, C-shaped sections; fabricated from built-up galvanized steel plates, metallic-coated steel sheet, or galvanized structural-steel shapes; to provide adequate backup for metal panels.
 - 4. Flange Bracing: Minimum 2-by-2-by-1/8-inch structural-steel angles or 1-inch-diameter, cold-formed structural tubing to stiffen primary-frame flanges.

5. Sag Bracing: Minimum 1-by-1-by-1/8-inch structural-steel angles.
 6. Base or Sill Angles: Manufacturer's standard base angle, minimum 3-by-2-inch, fabricated from zinc-coated (galvanized) steel sheet.
 7. Purlin and Girt Clips: Manufacturer's standard clips fabricated from metallic-coated steel sheet. Provide galvanized clips where clips are connected to galvanized framing members.
 8. Framing for Openings: Channel shapes; fabricated from galvanized, cold-formed, structural-steel sheet or galvanized structural-steel shapes. Frame head and jamb of door openings and head, jamb, and sill of other openings.
 9. Miscellaneous Structural Members: Manufacturer's standard sections fabricated from cold-formed, structural-steel sheet; built-up steel plates; or zinc-coated (galvanized) steel sheet; designed to withstand required loads.
- G. Bracing: Provide adjustable wind bracing as follows:
1. Rods: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 (345); or ASTM 529/A 529M, Grade 50; minimum 1/2-inch-diameter steel; threaded full length or threaded a minimum of 6 inches at each end.
 2. Angles: Fabricated from structural-steel shapes to match primary framing, of size required to withstand design loads.
 3. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
- H. Anchor Rods: Headed anchor rods as indicated in Anchor Rod Plan for attachment of metal building to foundation.
- I. Materials:
1. W-Shapes: ASTM A 992/A 992M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
 2. Channels, Angles, M-Shapes, and S-Shapes: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
 3. Plate and Bar: ASTM A 36/A 36M; ASTM A 572/A 572M, Grade 50 or 55; or ASTM A 529/A 529M, Grade 50 or 55.
 4. Structural-Steel Sheet: Hot-rolled, ASTM A 1011/A 1011M, Structural Steel (SS), Grades 30 through 55, or High-Strength Low-Alloy Steel (HSLAS) or High-Strength Low-Alloy Steel with Improved Formability (HSLAS-F), Grades 45 through 70; or cold-rolled, ASTM A 1008/A 1008M, Structural Steel (SS), Grades 25 through 80, or HSLAS, Grades 45 through 70.
 5. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, SS, Grades 33 through 80, or HSLAS or HSLAS-F, Grades 50 through 80; with G60 coating designation; mill phosphatized.
 6. Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A, carbon-steel, hex-head bolts; ASTM A 563 carbon-steel hex nuts; and ASTM F 844 plain (flat) steel washers.
 - a. Finish: Plain.

7. Structural Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563 heavy-hex carbon-steel nuts; and ASTM F 436 hardened carbon-steel washers.
 - a. Finish: Plain.
 8. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, heavy-hex-head steel structural bolts with spline ends.
 - a. Finish: Plain.
 9. Unheaded Anchor Rods: ASTM F 1554, Grade 36.
 - a. Configuration: Straight.
 - b. Nuts: ASTM A 563 hex carbon steel.
 - c. Plate Washers: ASTM A 36/A 36M carbon steel.
 - d. Washers: ASTM F 436 hardened carbon steel.
 - e. Finish: Plain.
 10. Headed Anchor Rods: ASTM F 1554, Grade 36.
 - a. Configuration: Straight.
 - b. Nuts: ASTM A 563 hex carbon steel.
 - c. Plate Washers: ASTM A 36/A 36M carbon steel.
 - d. Washers: ASTM F 436 hardened carbon steel.
 - e. Finish: Plain.
 11. Threaded Rods: ASTM A 36/A 36M.
 - a. Nuts: ASTM A 563 hex carbon steel.
 - b. Washers: ASTM A 36/A 36M carbon steel.
 - c. Finish: Plain.
- J. Finish: Factory primed. Apply specified primer immediately after cleaning and pretreating.
1. Clean and prepare in accordance with SSPC-SP2.
 2. Coat with epoxy primer or primer compatible with epoxy primer of water-based light industrial coatings specified in section 099123 "Interior Painting". Apply primer to primary and secondary framing specified without galvanized or metallic coatings. Apply to provide a minimum dry film thickness recommended by paint manufacturer, but not less than 1 mil.

2.5 METAL ROOF PANELS

- A. Standing-Seam, Vertical-Rib, Metal Roof Panels : Formed with vertical ribs at panel edges and flat pan between ribs; designed for sequential installation by mechanically attaching panels to supports using concealed clips located under one side of panels and engaging opposite edge of adjacent panels.

1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Thickness: As required to meet performance requirement, but not less than 0.024-inch (0.61-mm) nominal uncoated steel thickness.
 - b. Length: Provide panel length necessary to extend from ridge to eave as single panel.
 - c. Exterior Finish: Two-coat fluoropolymer.
 - d. Color: Match Architect's sample, equal to Nucor "Warm White".
2. Clips: Two-piece floating to accommodate thermal movement.
 - a. Coordinate height of clips with thickness of rigid insulation thermal block immediately below roof surface.
3. Joint Type: Mechanically seamed.
4. Panel Coverage: 16 inches.
5. Panel Height: As required to meet performance requirement, but not less than 2 inches.

B. Finishes:

1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.6 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Underlayment: Provide self-adhering, cold-applied, sheet underlayment, a minimum of 30 mils (0.76 mm) thick, consisting of slip-resistant, polyethylene-film top surface laminated to a layer of butyl or SBS-modified asphalt adhesive, with release-paper backing. Provide primer when recommended by underlayment manufacturer.
1. Thermal Stability: Stable after testing at 240 deg. F; ASTM D 1970.
 2. Low-Temperature Flexibility: Passes after testing at minus 20 deg. F; ASTM D 1970.
 3. Products: Subject to compliance with requirements, provide one of the following:
 - a. Carlisle Residential, a division of Carlisle Construction Materials; CCW WIP 300HT.
 - b. Grace Construction Products, a unit of W. R. Grace & Co.-Conn.; Ultra.
 - c. Henry Company; Blueskin PE200 HT.
 - d. Metal-Fab Manufacturing, LLC; MetShield.

- e. Owens Corning; WeatherLock Specialty Tile & Metal Underlayment.
- f. Polyguard Products, Inc.; Deck Guard HT.

2.7 METAL WALL LINER PANELS

- A. Exposed-Fastener, Tapered-Rib, Metal Wall Panels: Formed with raised, trapezoidal major ribs and intermediate stiffening ribs symmetrically spaced between major ribs; designed to be installed by lapping side edges of adjacent panels and mechanically attaching panels to supports using exposed fasteners in side laps.
 - 1. Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, prepainted by the coil-coating process to comply with ASTM A 755/A 755M.
 - a. Thickness: As required to meet performance requirement, but not less than 0.024-inch (0.61-mm) nominal uncoated steel thickness.
 - b. Length: Provide panel length necessary to extend from base flashing to soffit as single panel.
 - c. Exterior Finish: Two-coat fluoropolymer.
 - d. Color: Match Architect's sample, equal to Nucor "Warm White".
 - 2. Major-Rib Spacing: 12 inches o.c.
 - 3. Panel Coverage: 36 inches.
 - 4. Panel Height: 1.125 inches.
- B. Finishes:
 - 1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - 2. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.8 METAL SOFFIT PANELS

- A. General: Provide factory-formed metal soffit panels designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps. Include accessories required for weathertight installation.
- B. Concealed-Fastener, Flush-Profile, Perforated Metal Soffit Panels: Formed with vertical panel edges and flush surface; with flush joint between panels; with 1-inch- wide flange for attaching interior finish; designed to be installed by lapping and interconnecting side edges of adjacent panels and mechanically attaching through panel to supports using concealed fasteners in side laps.

1. Material: Aluminum sheet, ASTM B 209, alloy as standard with manufacturer for finish required, with temper as required to suit forming operations and performance required; with smooth, flat face, 0.032-inch nominal thickness.
 - a. Provide perforated panels to allow for air flow and under eave ventilation.
 - b. Exterior Finish: Fluoropolymer.
 - c. Color: Match Architect's sample, equal to Nucor "Warm White".
2. Panel Coverage: Not greater than 16 inches.
3. Panel Height: Not greater than 1.5 inches.

C. Finishes:

1. Exposed Coil-Coated Finish:
 - a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- D. Concealed Finish: Apply pretreatment and manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with a minimum total dry film thickness of 0.5 mil.

2.9 THERMAL INSULATION

- A. Faced Metal Building Insulation: ASTM C 991, Type II, glass-fiber-blanket insulation; 0.5-lb/cu. ft. density; 2-inch- wide, continuous, vapor-tight edge tabs; with a flame-spread index of 25 or less.
- B. Faced, Polyisocyanurate Board Insulation: ASTM C 1289, Type I (foil facing), Class 2, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, based on tests performed on unfaced core. Provide units tested for interior exposure without an approved thermal barrier.
- C. Retainer Strips: For securing insulation between supports, 0.025-inch (0.64-mm) nominal-thickness, formed, metallic-coated steel or PVC retainer clips colored to match insulation facing.
- D. Vapor-Retarder Facing: ASTM C 1136, with permeance not greater than 0.02 perm when tested according to ASTM E 96/E 96M, Desiccant Method.
 1. Composition: White polypropylene film facing, fiberglass scrim reinforcement, and metallized-polyester film backing.
- E. Vapor-Retarder Tape: Pressure-sensitive tape of type recommended by vapor-retarder manufacturer for sealing joints and penetrations in vapor retarder.

2.10 ACCESSORIES

- A. General: Provide accessories as standard with metal building system manufacturer and as specified. Fabricate and finish accessories at the factory to greatest extent possible, by manufacturer's standard procedures and processes. Comply with indicated profiles and with dimensional and structural requirements.
1. Form exposed sheet metal accessories that are without excessive oil-canning, buckling, and tool marks and that are true to line and levels indicated, with exposed edges folded back to form hems.
- B. Roof Panel Accessories: Provide components required for a complete metal roof panel assembly including copings, fasciae, corner units, ridge closures, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal roof panels unless otherwise indicated.
1. Closures: Provide closures at eaves and ridges, fabricated of same material as metal roof panels.
 2. Clips: Manufacturer's standard, formed from galvanized steel sheet, designed to withstand negative-load requirements. Coordinate height of clip to provide 1-inch- (25-mm-) clearance between bottom of roof panel and top of purlins to allow for expansion of thermal insulation.
 3. Cleats: Manufacturer's standard, mechanically seamed cleats formed from galvanized steel sheet.
 4. Closure Strips: Closed-cell, expanded, cellular, rubber or cross linked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- (25-mm-) thick, flexible closure strips; cut or premolded to match metal roof panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.
- C. Wall Liner Panel Accessories: Provide components required for a complete metal wall liner panel assembly including copings, fasciae, mullions, sills, corner units, clips, sealants, gaskets, fillers, closure strips, and similar items. Match material and finish of metal wall panels unless otherwise indicated.
1. Closures: Provide closure trim at eaves and rakes, fabricated of same material as metal wall panels.
 2. Base of wall panel flashing: Unequal leg channel, fabricated from same material as wall panels. Provide 1/4 inch diameter weep holes at 18 inches on center at bottom of channel. Extend building weather barriers over top of and tape top flange of channel to weather barrier. Set bottom of channel minimum of 1/2 inch above adjacent construction to allow weeps to drain. Do not seal joint between bottom of trim channel and adjacent construction.
 3. Backing Plates: Where joints in wall panels are submitted and approved by the Architect, provide metal backing plates at panel end splices, fabricated from material recommended by manufacturer.
 4. Closure Strips: Closed-cell, expanded, cellular, rubber or cross linked, polyolefin-foam or closed-cell laminated polyethylene; minimum 1-inch- thick, flexible closure strips; cut or premolded to match metal wall panel profile. Provide closure strips where indicated or necessary to ensure weathertight construction.

- D. Flashing and Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match adjacent metal panels.
1. Provide flashing and trim as required to seal against weather and to provide finished appearance. Locations include, but are not limited to, eaves, rakes, corners, bases, framed openings, ridges, fasciae, and fillers.
 2. Opening Trim: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch nominal uncoated steel thickness, prepainted with coil coating. Trim head and jamb of door openings, and head, jamb, and sill of other openings. Extend trim to back of framing at sill conditions.
 3. Top of masonry veneer flashing: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch nominal uncoated steel thickness, prepainted with coil coating.
 - a. Provide cleats formed from 0.018-inch material of same type and finish as flashing.
- E. Gutters: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match roof fascia and rake trim. Provide gutter profile indicated below at size indicated in Drawings, complete with end pieces, outlet tubes, and other special pieces as required. Fabricate in minimum 96-inch-long sections, sized according to SMACNA's "Architectural Sheet Metal Manual."
1. Gutter style F or H according to cited sheet metal standard, with back leg to anchor to eave plate or roof sheathing depending upon the location of the gutter.
 2. Gutter Supports: Fabricated from same material and finish as gutters.
 - a. Flat-stock gutter spacers and straps.
 3. Strainers: Bronze, copper, or aluminum wire ball type at outlets.
 4. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen.
- F. Downspouts: Rectangular, zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.018-inch nominal uncoated steel thickness, prepainted with coil coating; finished to match metal wall panels. Fabricate in minimum 10-foot- long sections, complete with mitered elbows and offsets.
1. Mounting Straps: Fabricated from same material and finish as gutters.
- G. Roof Vents at Low Roofs and Wall Conditions: Metal-Era Hi-Perf Ridge Vent for high-wall interface condition. Provide end caps to terminate vent at hip ridge conditions.
1. Finish: Finish of vent cap to match color of roof panels.
- H. Materials:

1. Fasteners: Self-tapping screws, bolts, nuts, self-locking rivets and bolts, end-welded studs, and other suitable fasteners designed to withstand design loads. Provide fasteners with heads matching color of materials being fastened by means of plastic caps or factory-applied coating.
 - a. Fasteners for Metal Roof Panels: Self-drilling, Type 410 stainless steel or self-tapping, Type 304 stainless-steel or zinc-alloy-steel hex washer head, with EPDM washer under heads of fasteners bearing on weather side of metal panels.
 - b. Fasteners for Metal Wall Panels: Self-drilling, Type 410 stainless steel or self-tapping, Type 304 stainless-steel or zinc-alloy-steel hex washer head, with EPDM sealing washers bearing on weather side of metal panels.
 - c. Fasteners for Flashing and Trim: Blind fasteners or self-drilling screws with hex washer head.
 - d. Blind Fasteners: High-strength aluminum or stainless-steel rivets.
2. Corrosion-Resistant Coating: Cold-applied asphalt mastic, compounded for 15-mil dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
3. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107/C 1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
4. Metal Panel Sealants:
 - a. Sealant Tape: Pressure-sensitive, 100 percent solids, gray polyisobutylene-compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape of manufacturer's standard size.
 - b. Joint Sealant: ASTM C 920; one part elastomeric polyurethane or polysulfide; of type, grade, class, and use classifications required to seal joints in metal panels and remain weathertight; and as recommended by metal building system manufacturer.

2.11 FABRICATION

- A. General: Design components and field connections required for erection to permit easy assembly.
 1. Mark each piece and part of the assembly to correspond with previously prepared erection drawings, diagrams, and instruction manuals.
 2. Fabricate structural framing to produce clean, smooth cuts and bends. Punch holes of proper size, shape, and location. Members shall be free of cracks, tears, and ruptures.
- B. Tolerances: Comply with MBMA's "Metal Building Systems Manual" for fabrication and erection tolerances.
- C. Primary Framing: Shop fabricate framing components to size and section indicated in manufacturer's design drawings, with baseplates, bearing plates, stiffeners, and other items required for erection welded into place. Cut, form, punch, drill, and weld framing for bolted field assembly.
 1. Make shop connections by welding or by using high-strength bolts.

2. Join flanges to webs of built-up members by a continuous, submerged arc-welding process.
 3. Brace compression flange of primary framing with steel angles or cold-formed structural tubing between frame web and purlin web or girt web, so flange compressive strength is within allowable limits for any combination of loadings.
 4. Weld clips to frames for attaching secondary framing if applicable, or punch for bolts.
 5. Shop Priming: Prepare surfaces and apply primer as specified after fabrication.
- D. Secondary Framing: Shop fabricate framing components to indicated size and section by roll forming or break forming, with baseplates, bearing plates, stiffeners, and other plates required for erection welded into place. Cut, form, punch, drill, and weld secondary framing for bolted field connections to primary framing.
1. Make shop connections by welding or by using non-high-strength bolts.
 2. Shop Priming: Do not prime galvanized or metallic coated framing. Prepare uncoated surfaces for shop priming according to SSPC-SP 2. Shop prime uncoated secondary framing as specified after fabrication.
- E. Metal Panels: Fabricate and finish metal panels at the factory to greatest extent possible, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements. Comply with indicated profiles and with dimensional and structural requirements.
1. Provide panel profile, including major ribs and intermediate stiffening ribs, if any, for full length of metal panel.

2.12 SOURCE QUALITY CONTROL

- A. Special Inspection: Owner will engage a qualified special inspector to perform source quality control inspections and to submit reports.
1. Accredited Manufacturers: Special inspections will not be required if fabrication is performed by an IAS AC472-accredited manufacturer approved by authorities having jurisdiction to perform such Work without special inspection.
 - a. After fabrication, submit copy of certificate of compliance to authorities having jurisdiction, certifying that Work was performed according to Contract requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with erector present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Before erection proceeds, survey elevations and locations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments to receive

structural framing, with erector present, for compliance with requirements and metal building system manufacturer's tolerances.

1. Engage land surveyor to perform surveying.
- C. Proceed with erection only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition.
- B. Provide temporary shores, guys, braces, and other supports during erection to keep structural framing secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural framing, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION OF STRUCTURAL FRAMING

- A. Erect metal building system according to manufacturer's written instructions and drawings.
- B. Do not field cut, drill, or alter structural members without written approval from metal building system manufacturer's professional engineer.
- C. Set structural framing accurately in locations and to elevations indicated, according to AISC specifications referenced in this Section. Maintain structural stability of frame during erection.
- D. Base: Clean concrete-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
1. Set plates for structural members on wedges, shims, or setting nuts as required.
 2. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
 3. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- E. Primary Framing and End Walls: Erect framing level, plumb, rigid, secure, and true to line. Level baseplates to a true even plane with full bearing to supporting structures, set with double-nutted anchor bolts. Use grout to obtain uniform bearing and to maintain a level base-line elevation. Moist-cure grout for not less than seven days after placement.
1. Make field connections using high-strength bolts installed according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt type and joint type specified.
 - a. Joint Type: Snug tightened or pretension as required by manufacturer.

- F. Secondary Framing: Erect framing level, plumb, rigid, secure, and true to line. Field bolt secondary framing to clips attached to primary framing.
 - 1. Provide rake or gable purlins with tight-fitting closure channels and fasciae.
 - 2. Locate and space wall girts to suit openings such as doors and windows.
 - 3. Provide supplemental framing at entire perimeter of openings, including doors, windows, louvers, ventilators, and other penetrations of roof and walls.
- G. Bracing: Install bracing in roof and sidewalls where indicated on erection drawings.
 - 1. Tighten rod and cable bracing to avoid sag.
 - 2. Locate interior end-bay bracing only where indicated.
- H. Framing for Openings: Provide shapes of proper design and size to reinforce openings and to carry loads and vibrations imposed, including equipment furnished under mechanical and electrical work. Securely attach to structural framing.
- I. Erection Tolerances: Maintain erection tolerances of structural framing within AISC 303.

3.4 METAL PANEL INSTALLATION, GENERAL

- A. Fabricate and finish metal panels and accessories at the factory, by manufacturer's standard procedures and processes, as necessary to fulfill indicated performance requirements demonstrated by laboratory testing. Comply with indicated profiles and with dimensional and structural requirements.
- B. On-Site Fabrication: Subject to compliance with requirements of this Section, metal panels may be fabricated on-site using UL-certified, portable roll-forming equipment if panels are of same profile and warranted by manufacturer to be equal to factory-formed panels. Fabricate according to equipment manufacturer's written instructions and to comply with details shown.
- C. Examination: Examine primary and secondary framing to verify that structural-panel support members and anchorages have been installed within alignment tolerances required by manufacturer.
 - 1. Examine roughing-in for components and systems penetrating metal panels, to verify actual locations of penetrations relative to seams before metal panel installation.
- D. General: Anchor metal panels and other components of the Work securely in place, with provisions for thermal and structural movement.
 - 1. Field cut metal panels as required for doors, windows, and other openings. Cut openings as small as possible, neatly to size required, and without damage to adjacent metal panel finishes.
 - a. Field cutting of metal panels by torch is not permitted.
 - 2. Install metal panels perpendicular to structural supports unless otherwise indicated.
 - 3. Flash and seal metal panels with weather closures at perimeter of openings and similar elements. Fasten with self-tapping screws.

4. Locate and space fastenings in uniform vertical and horizontal alignment.
 5. Do not splice metal wall panels for length unless conditions are reviewed and approved by Architect in field. If approved, locate metal panel splices over structural supports with end laps in alignment.
 6. Lap metal flashing over metal panels to allow moisture to run over and off the material.
- E. Lap-Seam Metal Panels: Install screw fasteners using power tools with controlled torque adjusted to compress EPDM washers tightly without damage to washers, screw threads, or metal panels. Install screws in predrilled holes.
1. Arrange and nest side-lap joints so prevailing winds blow over, not into, lapped joints. Lap ribbed or fluted sheets one full rib corrugation. Apply metal panels and associated items for neat and weathertight enclosure. Avoid "panel creep" or application not true to line.
- F. Metal Protection: Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by metal roof panel manufacturer.
- G. Joint Sealers: Install gaskets, joint fillers, and sealants where indicated and where required for weatherproof performance of metal panel assemblies. Provide types of gaskets, fillers, and sealants indicated; or, if not indicated, provide types recommended by metal panel manufacturer.
1. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

3.5 ROOF UNDERLAYMENT INSTALLATION AT WOOD SHEATHING

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply over entire roof surface with wood sheathing, wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
- B. Extend under layments over roof edge flashings and back leg of gutters.

3.6 METAL ROOF PANEL INSTALLATION

- A. General: Provide metal roof panels of full length from eave to ridge unless otherwise indicated or restricted by shipping limitations.
1. Install ridge and hip caps as metal roof panel work proceeds.
 2. Flash and seal metal roof panels with weather closures at eaves and rakes. Fasten with self-tapping screws, in concealed locations to the extent possible.
- B. Standing-Seam Metal Roof Panels: Fasten metal roof panels to supports with concealed clips at each standing-seam joint, at location and spacing and with fasteners recommended by manufacturer.

1. Where roof is installed over purlins of metal building system, provide clips of height required to allow 1 1/2 inch for expansion of insulation between top of purlin and underside of roof panel.
 2. Where roof is installed over wood decking and framing, provide clips of height required to allow 1/2 inch between underlayment and underside of roof panel.
 3. Install clips to supports with self-drilling or self-tapping fasteners.
 4. Seamed Joint: Crimp standing seams with manufacturer-approved motorized seamer tool so that clip, metal roof panel, and factory-applied sealant are completely engaged.
 5. Rigidly fasten eave end of metal roof panels and allow ridge end free movement for thermal expansion and contraction. Predrill panels for fasteners.
 6. Provide metal closures at peaks rake edges rake walls and each side of ridge and hip caps.
- C. Metal Fascia Panels: Align bottom of metal panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws. Flash and seal metal panels with weather closures where fasciae meet soffits, along lower panel edges, and at perimeter of all openings.
- D. Metal Roof Panel Installation Tolerances: Shim and align metal roof panels within installed tolerance of 1/4 inch in 20 feet on slope and location lines and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.7 METAL WALL LINER PANEL INSTALLATION

- A. General: Install metal wall panels in orientation, sizes, and locations indicated on Drawings. Install panels perpendicular to girts, extending full height of building. Anchor metal wall panels and other components of the Work securely in place, with provisions for thermal and structural movement.
1. Unless otherwise indicated, begin metal panel installation at corners with center of rib lined up with line of framing.
 2. Shim or otherwise plumb substrates receiving metal wall panels.
 3. Rigidly fasten base end of metal wall panels and allow eave end free movement for thermal expansion and contraction. Predrill panels.
 4. Install screw fasteners in predrilled holes.
 5. Install flashing and trim as metal wall panel work proceeds.
 6. Align bottom of metal wall panels and fasten with blind rivets, bolts, or self-drilling or self-tapping screws.
- B. Metal Wall Liner Panels: Install metal wall liner panels on interior side of girts. Attach metal wall liner panels to supports with fasteners as recommended by manufacturer.
- C. Installation Tolerances: Shim and align metal wall liner panels within installed tolerance of 1/4 inch in 20 feet, noncumulative; level, plumb, and on location lines; and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.8 METAL SOFFIT PANEL INSTALLATION

- A. Provide metal soffit panels the full width of soffits. Install panel's perpendicular to line of fascia.

- B. Flash and seal metal soffit panels with weather closures where panels meet walls and at perimeter of all openings.

3.9 THERMAL INSULATION INSTALLATION

- A. General: Install insulation concurrently with metal panel installation, in thickness indicated to cover entire surface, according to manufacturer's written instructions.
 - 1. Set vapor-retarder-faced units with vapor retarder toward warm side. Do not obstruct ventilation spaces except for firestopping.
 - 2. Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to the surrounding construction to ensure airtight installation.
 - 3. Install factory-laminated, vapor-retarder-faced blankets straight and true in one-piece lengths, with both sets of facing tabs sealed, to provide a complete vapor retarder.
- B. Blanket Roof Insulation: Comply with the following installation method:
 - 1. Over-Purlin with Tall Metal Roof Clips Installation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing (Purlin). Cut back fiberglass and anchor clip base plate against vapor retarder to framing. Install clip in baseplate and reset fiberglass against clip. Hold insulation in place by panels fastened to clips.
 - 2. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
- C. Blanket Wall Insulation: Extend insulation and vapor retarder over and perpendicular to top flange of secondary framing. Hold in place by metal wall panels fastened to secondary framing.
 - 1. Retainer Strips: Install retainer strips at each longitudinal insulation joint, straight and taut, nesting with secondary framing to hold insulation in place.
- D. Board Wall Insulation: Install per requirement in Section 072100 "Thermal Insulation".

3.10 ACCESSORY INSTALLATION

- A. General: Install accessories with positive anchorage to building and weathertight mounting, and provide for thermal expansion. Coordinate installation with flashings and other components.
 - 1. Install components required for a complete metal roof panel assembly, including trim, ridge closures, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 - 2. Install components for a complete metal wall panel assembly, including trim, corners, seam covers, flashings, sealants, gaskets, fillers, closure strips, and similar items.
 - 3. Where dissimilar metals contact each other or corrosive substrates, protect against galvanic action by applying rubberized-asphalt underlayment to each contact surface, or by other permanent separation as recommended by manufacturer.
- B. Flashing and Trim: Comply with performance requirements, manufacturer's written installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Provide concealed fasteners

where possible, and set units true to line and level. Install work with laps, joints, and seams that will be permanently watertight and weather resistant.

1. Install exposed flashing and trim that is without excessive oil-canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance.
 2. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at a maximum of 10 feet with no joints allowed within 24 inches of corner or intersection.
 3. Splice Plates and Expansion Provisions at Trim at Roof Edge Fascia: Form expansion joints with concealed splice plates of same material type, finish and shape as flashing and/or trim. Provide butyl sealant strips on each side of splice plate. Do not engage splice plate in cleats retaining flashing to prevent deformation of face and line of trim.
- C. Gutters: Join sections with riveted-and-sealed joints. Attach gutters with gutter straps spaced as required for gutter size, but not more than 36 inches o.c. using concealed fasteners. Provide end closures and seal watertight with sealant.
- a. Provide for thermal expansion between gutter sections. Follow details for butt type gutter expansion joint with cover as indicated in .SMACNA's "Architectural Sheet Metal Manual
- D. Downspouts: Join sections with 1-1/2-inch telescoping joints. Provide fasteners designed to hold downspouts securely 1 inch away from masonry walls; locate fasteners at top and bottom and at approximately 60 inches o.c. in between.
1. Downspout brackets at metal wall panels shall be deeper than brackets at masonry wall panels so downspout is continuous from underside of eave to grade without transition at masonry.
 2. Provide downspout brackets with hemmed top, bottom and end edges. Provide thickness of material at upper brackets to hold downspout secure with
 3. Tie downspouts to underground drainage system with cast-iron downspout boots at locations indicated.

3.11 FIELD QUALITY CONTROL

- A. Special Inspections: Owner reserves the right to engage a qualified special inspector to perform field quality control special inspections of connections and to submit reports.
- B. Product will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.12 CLEANING AND PROTECTION

- A. Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780/A 780M and manufacturer's written instructions.

- B. Touchup Painting: After erection, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted structural framing, bearing plates, and accessories.
 - 1. Clean and prepare surfaces by SSPC-SP 2, "Hand Tool Cleaning," or by SSPC-SP 3, "Power Tool Cleaning."
 - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

- C. Metal Panels: Remove temporary protective coverings and strippable films, if any, as metal panels are installed. On completion of metal panel installation, clean finished surfaces as recommended by metal panel manufacturer. Maintain in a clean condition during construction.
 - 1. Replace metal panels that have been damaged or have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 133419