

**PROJECT MANUAL**  
**FOR**  
**RECONSTRUCTION OF:**  
**TRUMANN FIRE STATION**  
**801 West Main Street**  
**Trumann, Arkansas 72472**



**HORD**  
ARCHITECTS

66 Monroe Avenue, Suite 105  
Memphis, Tennessee 38103  
(901) 527-9085

**STRUCTURAL ENGINEER**  
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1989 Oak Tree Cove, Suite B  
Hernando, Mississippi 38632

**MECHANICAL, PLUMBING, FIRE PROTECTION  
& ELECTRICAL ENGINEERS**

Miller-Newell Engineers  
510 Third Street  
Newport, Arkansas 72112

**CIVIL ENGINEER**  
Miller-Newell Engineers  
510 Third Street  
Newport, Arkansas 72112

**DATE: July 31, 2023**



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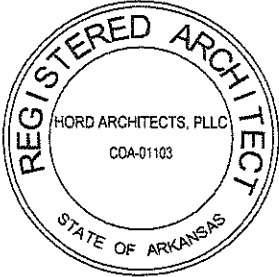
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SECTION 00100

SEALS PAGE



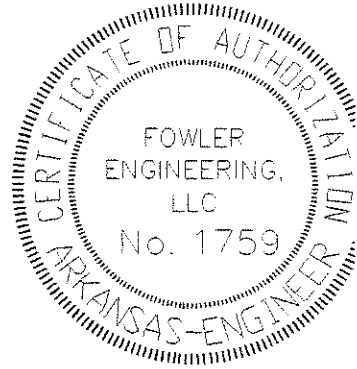
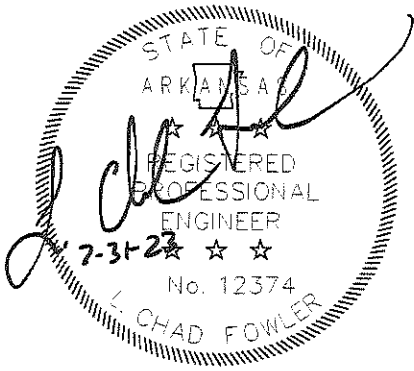
ARCHITECT



ELECTRICAL ENGINEER



MECHANICAL ENGINEER



STRUCTURAL ENGINEER



CIVIL ENGINEER

END OF SECTION



SECTION 00500  
AGREEMENT FORM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions and of Division 1, General Requirements govern all work in this Section.

1.02 CONTRACT FORM

- A. The following form will be used during the construction of this Project. It shall be the Contractor's responsibility to obtain this form for his use. A sample copy of this document is included in this Project Manual.
  - 1. Contract Form: AIA Document A101, 2017 Edition, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum.

END OF SECTION





# HORD ARCHITECTS

66 MONROE AVENUE, SUITE 105, MEMPHIS, TN 38103  
PHONE (901) 527-9085, FAX (901) 527-9087

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Date: August 28, 2023  
Subject: Trumann Fire Station  
801 West Main St., Trumann, Arkansas 72472

## **Addendum # 2**

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The following shall be incorporated into the construction documents:

- A. Truck Bay Doors: The masonry opening for all truck bay doors is 12'-0" wide x 14'-0" tall.
  - B. Brick ledge: as required to install the proposed brick ledge shown in detail 1/A406, remove existing sidewalks. Remove full width of sidewalk for length required to install brick ledge. Replace sidewalk to width and length that was removed, per the thickness and specification for proposed sidewalks.
  - C. Slab and grade beam shown in details 1/A407 and 7/S301 are existing. The original drawings show a 12" wide by 2'-0" deep grade beam with 1/4" isolation joints on either side. The structural documents were designed and drawn using the original drawings provided.
  - D. Door Hardware is denoted in Door/Hardware symbols shown on the floor plans. Refer to sheet T101 for symbol legend, and sheet A701 for Door Schedule and Hardware Schedule.
  - E. Cracks in Existing slab: Existing cracks in concrete floor shall be filled with floor sealer.
  - F. Detail marks 2/S202, on east side of building, refer to detail 3/S202 instead.
  - G. Limit of sidewalk demolition on south of building: All demolition is shown graphically. Contractor is responsible for measurements and quantities for all work, including demolition.
  - H. All bidders are required to visit the site to thoroughly familiarize themselves with all existing conditions prior to submitting a bid proposal. See sheet T101, General Note 14.
  - I. At the north and south truck bays, the existing slab slopes down approximately 2" from the primary slab elevation to the existing exterior line of the truck bay slab.
    - 1. The proposed north side slab extension shall tie-in at the lower elevation and shall be flat.
    - 2. The elevation to the bearing line of the walls/structure for the truck bays shall be as shown in the drawings; stud heights shall be adjusted as required.
  - J. Detail 10/S301: The original construction drawings show footings under walls that were removed. The structural documents for this project were designed and drawn using the original drawings provided.
  - K. Overhead door motors: All overhead door motors shall be 208 volt, 1-phase.
-

- L. Turn down in detail 2/S202: The original drawings show a 2'-0" exterior turn down and match the requirements of the original geotechnical report, which were assumed to be followed. The structural documents for this project were designed and drawn using the original drawings and geotechnical report provided to the engineers. The details in the construction documents should be followed as drawn for this project.
- M. All data equipment shall be located in Electrical Room 125.
- N. Roofing underlayment, Specification Section 07411.2.08.A:
  - 1. In lieu of Tamko Moisture Guard Plus, provide the following:
    - A. Carlisle WIP 250HT Multi-Purpose self-adhering roofing underlayment. Underlayment shall be installed as shown in the drawings and per the manufacturer's instructions.
- O. Ceramic Wall Tile:
  - 1. Provide wall tile as shown in the interior elevations, and specified in the Project Manual Section 09300.

END OF ADDENDUM # 2



# HORD ARCHITECTS

66 MONROE AVENUE, SUITE 105, MEMPHIS, TN 38103  
PHONE (901) 527-9085, FAX (901) 527-9087

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Date: August 22, 2023  
Subject: Trumann Fire Station  
801 West Main St., Trumann, Arkansas 72472

## **Addendum # 1**

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The following shall be incorporated into the construction documents:

- A. The duplex outlets in the following rooms shall be combination duplex outlets with one USB type A port and one USB type C port equal to Bryant Model USBB15AC5. Color shall be selected by the Architect.
- Room Name  
Dayroom 101  
Women Bedroom 103  
Bunkroom 107  
Workout Room 114  
Captains Office 118  
Asst. Chief Office 119  
Fire Chief Office 122
- B. Showers units in Men's 108 and Women's 109 are fiberglass as specified in the plumbing schedule.
- C. Kitchen Counter Tops:
1. In lieu of Plastic Laminate counter tops, provide 3cm thick granite counter tops for the kitchen cabinets and island. The granite shall have a fully rounded edge profile. At walls, provide 4" tall granite backsplashes with square corners.
  2. Allow the sum of Eighty-Five (\$85.00) per square foot. Allowance is for material only; fabrication, delivery to the job site, installation and all required equipment and accessories shall be part of the base bid. Refer also to Section 01020 Allowances.
- D. Folding Truck Bay door, Door Type G
1. Add the following to Specification Section 08361 – Folding Door System, Article 2.01 -  
MANUFACTURERS:  
C. JUS Doors, Inc, 3714 Alliance Dr, Ste. 400, Greensboro, NC 27416. [www.jusdoors.us](http://www.jusdoors.us).
  2. Doors supplied to the job shall meet or exceed all requirements of the specified doors, for materials, equipment, accessories, hardware, and all other criteria.
  3. Doors supplied to the job shall match the design shown in the drawings, including size; glazing pattern and type; clear opening size; controls type and location. Doors supplied to the job shall not require modification of the building design, including structure or materials, and shall fit within the operating space provided by the design.
- E. Folding Truck Bay door operator:
1. The door operator motor shall be 208 volt, 1-phase.

END OF ADDENDUM # 1

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# AIA<sup>®</sup> Document A101<sup>®</sup> – 2017

## *Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum*

AGREEMENT made as of the    day of    in the year  
*(In words, indicate day, month and year.)*

BETWEEN the Owner:  
*(Name, legal status, address and other information)*

and the Contractor:  
*(Name, legal status, address and other information)*

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

The Architect:  
*(Name, legal status, address and other information)*

The Owner and Contractor agree as follows.

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

The parties should complete A101<sup>®</sup>-2017, Exhibit A, Insurance and Bonds, contemporaneously with this Agreement. AIA Document A201<sup>®</sup>-2017, General Conditions of the Contract for Construction, is adopted in this document by reference. Do not use with other general conditions unless this document is modified.

Init.

TABLE OF ARTICLES

- 1 THE CONTRACT DOCUMENTS
- 2 THE WORK OF THIS CONTRACT
- 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION
- 4 CONTRACT SUM
- 5 PAYMENTS
- 6 DISPUTE RESOLUTION
- 7 TERMINATION OR SUSPENSION
- 8 MISCELLANEOUS PROVISIONS
- 9 ENUMERATION OF CONTRACT DOCUMENTS

EXHIBIT A INSURANCE AND BONDS

ARTICLE 1 THE CONTRACT DOCUMENTS

The Contract Documents consist of this Agreement, Conditions of the Contract (General, Supplementary, and other Conditions), Drawings, Specifications, Addenda issued prior to execution of this Agreement, other documents listed in this Agreement, and Modifications issued after execution of this Agreement, all of which form the Contract, and are as fully a part of the Contract as if attached to this Agreement or repeated herein. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. An enumeration of the Contract Documents, other than a Modification, appears in Article 9.

ARTICLE 2 THE WORK OF THIS CONTRACT

The Contractor shall fully execute the Work described in the Contract Documents, except as specifically indicated in the Contract Documents to be the responsibility of others.

ARTICLE 3 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 3.1 The date of commencement of the Work shall be:

*(Check one of the following boxes.)*

- The date of this Agreement.
- A date set forth in a notice to proceed issued by the Owner.
- Established as follows:  
*(Insert a date or a means to determine the date of commencement of the Work.)*

If a date of commencement of the Work is not selected, then the date of commencement shall be the date of this Agreement.

§ 3.2 The Contract Time shall be measured from the date of commencement of the Work.

§ 3.3 Substantial Completion

§ 3.3.1 Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion of the entire Work:

*(Check one of the following boxes and complete the necessary information.)*

Init.



[ ] Not later than ( ) calendar days from the date of commencement of the Work.

[ ] By the following date:

§ 3.3.2 Subject to adjustments of the Contract Time as provided in the Contract Documents, if portions of the Work are to be completed prior to Substantial Completion of the entire Work, the Contractor shall achieve Substantial Completion of such portions by the following dates:

Portion of Work	Substantial Completion Date
-----------------	-----------------------------

§ 3.3.3 If the Contractor fails to achieve Substantial Completion as provided in this Section 3.3, liquidated damages, if any, shall be assessed as set forth in Section 4.5.

#### ARTICLE 4 CONTRACT SUM

§ 4.1 The Owner shall pay the Contractor the Contract Sum in current funds for the Contractor's performance of the Contract. The Contract Sum shall be (\$ ), subject to additions and deductions as provided in the Contract Documents.

#### § 4.2 Alternates

§ 4.2.1 Alternates, if any, included in the Contract Sum:

Item	Price
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§ 4.2.2 Subject to the conditions noted below, the following alternates may be accepted by the Owner following execution of this Agreement. Upon acceptance, the Owner shall issue a Modification to this Agreement. *(Insert below each alternate and the conditions that must be met for the Owner to accept the alternate.)*

Item	Price	Conditions for Acceptance
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§ 4.3 Allowances, if any, included in the Contract Sum: *(Identify each allowance.)*

Item	Price
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#### § 4.4 Unit prices, if any:

*(Identify the item and state the unit price and quantity limitations, if any, to which the unit price will be applicable.)*

Item	Units and Limitations	Price per Unit (\$0.00)
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#### § 4.5 Liquidated damages, if any:

*(Insert terms and conditions for liquidated damages, if any.)*

#### § 4.6 Other:

*(Insert provisions for bonus or other incentives, if any, that might result in a change to the Contract Sum.)*

Init.

## ARTICLE 5 PAYMENTS

### § 5.1 Progress Payments

§ 5.1.1 Based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect, the Owner shall make progress payments on account of the Contract Sum to the Contractor as provided below and elsewhere in the Contract Documents.

§ 5.1.2 The period covered by each Application for Payment shall be one calendar month ending on the last day of the month, or as follows:

§ 5.1.3 Provided that an Application for Payment is received by the Architect not later than the day of a month, the Owner shall make payment of the amount certified to the Contractor not later than the day of the month. If an Application for Payment is received by the Architect after the application date fixed above, payment of the amount certified shall be made by the Owner not later than ( ) days after the Architect receives the Application for Payment. *(Federal, state or local laws may require payment within a certain period of time.)*

§ 5.1.4 Each Application for Payment shall be based on the most recent schedule of values submitted by the Contractor in accordance with the Contract Documents. The schedule of values shall allocate the entire Contract Sum among the various portions of the Work. The schedule of values shall be prepared in such form, and supported by such data to substantiate its accuracy, as the Architect may require. This schedule of values shall be used as a basis for reviewing the Contractor's Applications for Payment.

§ 5.1.5 Applications for Payment shall show the percentage of completion of each portion of the Work as of the end of the period covered by the Application for Payment.

§ 5.1.6 In accordance with AIA Document A201™-2017, General Conditions of the Contract for Construction, and subject to other provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:

§ 5.1.6.1 The amount of each progress payment shall first include:

- .1 That portion of the Contract Sum properly allocable to completed Work;
- .2 That portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction, or, if approved in advance by the Owner, suitably stored off the site at a location agreed upon in writing; and
- .3 That portion of Construction Change Directives that the Architect determines, in the Architect's professional judgment, to be reasonably justified.

§ 5.1.6.2 The amount of each progress payment shall then be reduced by:

- .1 The aggregate of any amounts previously paid by the Owner;
- .2 The amount, if any, for Work that remains uncorrected and for which the Architect has previously withheld a Certificate for Payment as provided in Article 9 of AIA Document A201-2017;
- .3 Any amount for which the Contractor does not intend to pay a Subcontractor or material supplier, unless the Work has been performed by others the Contractor intends to pay;
- .4 For Work performed or defects discovered since the last payment application, any amount for which the Architect may withhold payment, or nullify a Certificate of Payment in whole or in part, as provided in Article 9 of AIA Document A201-2017; and
- .5 Retainage withheld pursuant to Section 5.1.7.

### § 5.1.7 Retainage

§ 5.1.7.1 For each progress payment made prior to Substantial Completion of the Work, the Owner may withhold the following amount, as retainage, from the payment otherwise due:

*(Insert a percentage or amount to be withheld as retainage from each Application for Payment. The amount of retainage may be limited by governing law.)*

§ 5.1.7.1.1 The following items are not subject to retainage:  
(Insert any items not subject to the withholding of retainage, such as general conditions, insurance, etc.)

§ 5.1.7.2 Reduction or limitation of retainage, if any, shall be as follows:  
(If the retainage established in Section 5.1.7.1 is to be modified prior to Substantial Completion of the entire Work, including modifications for Substantial Completion of portions of the Work as provided in Section 3.3.2, insert provisions for such modifications.)

§ 5.1.7.3 Except as set forth in this Section 5.1.7.3, upon Substantial Completion of the Work, the Contractor may submit an Application for Payment that includes the retainage withheld from prior Applications for Payment pursuant to this Section 5.1.7. The Application for Payment submitted at Substantial Completion shall not include retainage as follows:  
(Insert any other conditions for release of retainage upon Substantial Completion.)

§ 5.1.8 If final completion of the Work is materially delayed through no fault of the Contractor, the Owner shall pay the Contractor any additional amounts in accordance with Article 9 of AIA Document A201-2017.

§ 5.1.9 Except with the Owner's prior approval, the Contractor shall not make advance payments to suppliers for materials or equipment which have not been delivered and stored at the site.

#### § 5.2 Final Payment

§ 5.2.1 Final payment, constituting the entire unpaid balance of the Contract Sum, shall be made by the Owner to the Contractor when

- .1 the Contractor has fully performed the Contract except for the Contractor's responsibility to correct Work as provided in Article 12 of AIA Document A201-2017, and to satisfy other requirements, if any, which extend beyond final payment; and
- .2 a final Certificate for Payment has been issued by the Architect.

§ 5.2.2 The Owner's final payment to the Contractor shall be made no later than 30 days after the issuance of the Architect's final Certificate for Payment, or as follows:

#### § 5.3 Interest

Payments due and unpaid under the Contract shall bear interest from the date payment is due at the rate stated below, or in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.  
(Insert rate of interest agreed upon, if any.)

%

### ARTICLE 6 DISPUTE RESOLUTION

#### § 6.1 Initial Decision Maker

The Architect will serve as the Initial Decision Maker pursuant to Article 15 of AIA Document A201-2017, unless the parties appoint below another individual, not a party to this Agreement, to serve as the Initial Decision Maker.  
(If the parties mutually agree, insert the name, address and other contact information of the Initial Decision Maker, if other than the Architect.)

**§ 6.2 Binding Dispute Resolution**

For any Claim subject to, but not resolved by, mediation pursuant to Article 15 of AIA Document A201–2017, the method of binding dispute resolution shall be as follows:  
*(Check the appropriate box.)*

- Arbitration pursuant to Section 15.4 of AIA Document A201–2017
- Litigation in a court of competent jurisdiction
- Other *(Specify)*

If the Owner and Contractor do not select a method of binding dispute resolution, or do not subsequently agree in writing to a binding dispute resolution method other than litigation, Claims will be resolved by litigation in a court of competent jurisdiction.

**ARTICLE 7 TERMINATION OR SUSPENSION**

§ 7.1 The Contract may be terminated by the Owner or the Contractor as provided in Article 14 of AIA Document A201–2017.

§ 7.1.1 If the Contract is terminated for the Owner’s convenience in accordance with Article 14 of AIA Document A201–2017, then the Owner shall pay the Contractor a termination fee as follows:  
*(Insert the amount of, or method for determining, the fee, if any, payable to the Contractor following a termination for the Owner’s convenience.)*

§ 7.2 The Work may be suspended by the Owner as provided in Article 14 of AIA Document A201–2017.

**ARTICLE 8 MISCELLANEOUS PROVISIONS**

§ 8.1 Where reference is made in this Agreement to a provision of AIA Document A201–2017 or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

§ 8.2 The Owner’s representative:  
*(Name, address, email address, and other information)*

§ 8.3 The Contractor’s representative:  
*(Name, address, email address, and other information)*

Init.

§ 8.4 Neither the Owner's nor the Contractor's representative shall be changed without ten days' prior notice to the other party.

§ 8.5 Insurance and Bonds

§ 8.5.1 The Owner and the Contractor shall purchase and maintain insurance as set forth in AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor where the basis of payment is a Stipulated Sum, Exhibit A, Insurance and Bonds, and elsewhere in the Contract Documents.

§ 8.5.2 The Contractor shall provide bonds as set forth in AIA Document A101™-2017 Exhibit A, and elsewhere in the Contract Documents.

§ 8.6 Notice in electronic format, pursuant to Article 1 of AIA Document A201-2017, may be given in accordance with AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, if completed, or as otherwise set forth below:

*(If other than in accordance with AIA Document E203-2013, insert requirements for delivering notice in electronic format such as name, title, and email address of the recipient and whether and how the system will be required to generate a read receipt for the transmission.)*

§ 8.7 Other provisions:

ARTICLE 9 ENUMERATION OF CONTRACT DOCUMENTS

§ 9.1 This Agreement is comprised of the following documents:

- .1 AIA Document A101™-2017, Standard Form of Agreement Between Owner and Contractor
- .2 AIA Document A101™-2017, Exhibit A, Insurance and Bonds
- .3 AIA Document A201™-2017, General Conditions of the Contract for Construction
- .4 AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:  
*(Insert the date of the E203-2013 incorporated into this Agreement.)*

.5 Drawings

Number	Title	Date
--------	-------	------

.6 Specifications

Section	Title	Date	Pages
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.7 Addenda, if any:

Number	Date	Pages
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Portions of Addenda relating to bidding or proposal requirements are not part of the Contract Documents unless the bidding or proposal requirements are also enumerated in this Article 9.

.8 Other Exhibits:

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

Init.

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

[ ] The Sustainability Plan:

Title	Date	Pages
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[ ] Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents, if any, listed below:

*(List here any additional documents that are intended to form part of the Contract Documents. AIA Document A201™-2017 provides that the advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or proposal, portions of Addenda relating to bidding or proposal requirements, and other information furnished by the Owner in anticipation of receiving bids or proposals, are not part of the Contract Documents unless enumerated in this Agreement. Any such documents should be listed here only if intended to be part of the Contract Documents.)*

This Agreement entered into as of the day and year first written above.

\_\_\_\_\_  
OWNER (Signature)

\_\_\_\_\_  
CONTRACTOR (Signature)

\_\_\_\_\_  
(Printed name and title)

\_\_\_\_\_  
(Printed name and title)

Init.

# AIA<sup>®</sup> Document A101<sup>®</sup> – 2017 Exhibit A

## *Insurance and Bonds*

This Insurance and Bonds Exhibit is part of the Agreement, between the Owner and the Contractor, dated the    day of    in the year  
*(In words, indicate day, month and year.)*

for the following **PROJECT**:  
*(Name and location or address)*

**THE OWNER:**  
*(Name, legal status and address)*

**THE CONTRACTOR:**  
*(Name, legal status and address)*

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

This document is intended to be used in conjunction with AIA Document A201<sup>®</sup>-2017, General Conditions of the Contract for Construction. Article 11 of A201<sup>®</sup>-2017 contains additional insurance provisions.

### TABLE OF ARTICLES

- A.1    GENERAL
- A.2    OWNER'S INSURANCE
- A.3    CONTRACTOR'S INSURANCE AND BONDS
- A.4    SPECIAL TERMS AND CONDITIONS

#### ARTICLE A.1    GENERAL

The Owner and Contractor shall purchase and maintain insurance, and provide bonds, as set forth in this Exhibit. As used in this Exhibit, the term General Conditions refers to AIA Document A201<sup>™</sup>-2017, General Conditions of the Contract for Construction.

#### ARTICLE A.2    OWNER'S INSURANCE

##### § A.2.1 General

Prior to commencement of the Work, the Owner shall secure the insurance, and provide evidence of the coverage, required under this Article A.2 and, upon the Contractor's request, provide a copy of the property insurance policy or policies required by Section A.2.3. The copy of the policy or policies provided shall contain all applicable conditions, definitions, exclusions, and endorsements.

##### § A.2.2 Liability Insurance

The Owner shall be responsible for purchasing and maintaining the Owner's usual general liability insurance.

**§ A.2.3 Required Property Insurance**

§ A.2.3.1 Unless this obligation is placed on the Contractor pursuant to Section A.3.3.2.1, the Owner shall purchase and maintain, from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located, property insurance written on a builder's risk "all-risks" completed value or equivalent policy form and sufficient to cover the total value of the entire Project on a replacement cost basis. The Owner's property insurance coverage shall be no less than the amount of the initial Contract Sum, plus the value of subsequent Modifications and labor performed and materials or equipment supplied by others. The property insurance shall be maintained until Substantial Completion and thereafter as provided in Section A.2.3.1.3, unless otherwise provided in the Contract Documents or otherwise agreed in writing by the parties to this Agreement. This insurance shall include the interests of the Owner, Contractor, Subcontractors, and Sub-subcontractors in the Project as insureds. This insurance shall include the interests of mortgagees as loss payees.

§ A.2.3.1.1 **Causes of Loss.** The insurance required by this Section A.2.3.1 shall provide coverage for direct physical loss or damage, and shall not exclude the risks of fire, explosion, theft, vandalism, malicious mischief, collapse, earthquake, flood, or windstorm. The insurance shall also provide coverage for ensuing loss or resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials. Sub-limits, if any, are as follows:

*(Indicate below the cause of loss and any applicable sub-limit.)*

Causes of Loss	Sub-Limit
----------------	-----------

§ A.2.3.1.2 **Specific Required Coverages.** The insurance required by this Section A.2.3.1 shall provide coverage for loss or damage to falsework and other temporary structures, and to building systems from testing and startup. The insurance shall also cover debris removal, including demolition occasioned by enforcement of any applicable legal requirements, and reasonable compensation for the Architect's and Contractor's services and expenses required as a result of such insured loss, including claim preparation expenses. Sub-limits, if any, are as follows:

*(Indicate below type of coverage and any applicable sub-limit for specific required coverages.)*

Coverage	Sub-Limit
----------	-----------

§ A.2.3.1.3 Unless the parties agree otherwise, upon Substantial Completion, the Owner shall continue the insurance required by Section A.2.3.1 or, if necessary, replace the insurance policy required under Section A.2.3.1 with property insurance written for the total value of the Project that shall remain in effect until expiration of the period for correction of the Work set forth in Section 12.2.2 of the General Conditions.

§ A.2.3.1.4 **Deductibles and Self-Insured Retentions.** If the insurance required by this Section A.2.3 is subject to deductibles or self-insured retentions, the Owner shall be responsible for all loss not covered because of such deductibles or retentions.

§ A.2.3.2 **Occupancy or Use Prior to Substantial Completion.** The Owner's occupancy or use of any completed or partially completed portion of the Work prior to Substantial Completion shall not commence until the insurance company or companies providing the insurance under Section A.2.3.1 have consented in writing to the continuance of coverage. The Owner and the Contractor shall take no action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of insurance, unless they agree otherwise in writing.

**§ A.2.3.3 Insurance for Existing Structures**

If the Work involves remodeling an existing structure or constructing an addition to an existing structure, the Owner shall purchase and maintain, until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, "all-risks" property insurance, on a replacement cost basis, protecting the existing structure against direct physical loss or damage from the causes of loss identified in Section A.2.3.1, notwithstanding the undertaking of the Work. The Owner shall be responsible for all co-insurance penalties.



**§ A.2.4 Optional Extended Property Insurance.**

The Owner shall purchase and maintain the insurance selected and described below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. For each type of insurance selected, indicate applicable limits of coverage or other conditions in the fill point below the selected item.)*

- § A.2.4.1 Loss of Use, Business Interruption, and Delay in Completion Insurance**, to reimburse the Owner for loss of use of the Owner's property, or the inability to conduct normal operations due to a covered cause of loss.
  
- § A.2.4.2 Ordinance or Law Insurance**, for the reasonable and necessary costs to satisfy the minimum requirements of the enforcement of any law or ordinance regulating the demolition, construction, repair, replacement or use of the Project.
  
- § A.2.4.3 Expediting Cost Insurance**, for the reasonable and necessary costs for the temporary repair of damage to insured property, and to expedite the permanent repair or replacement of the damaged property.
  
- § A.2.4.4 Extra Expense Insurance**, to provide reimbursement of the reasonable and necessary excess costs incurred during the period of restoration or repair of the damaged property that are over and above the total costs that would normally have been incurred during the same period of time had no loss or damage occurred.
  
- § A.2.4.5 Civil Authority Insurance**, for losses or costs arising from an order of a civil authority prohibiting access to the Project, provided such order is the direct result of physical damage covered under the required property insurance.
  
- § A.2.4.6 Ingress/Egress Insurance**, for loss due to the necessary interruption of the insured's business due to physical prevention of ingress to, or egress from, the Project as a direct result of physical damage.
  
- § A.2.4.7 Soft Costs Insurance**, to reimburse the Owner for costs due to the delay of completion of the Work, arising out of physical loss or damage covered by the required property insurance: including construction loan fees; leasing and marketing expenses; additional fees, including those of architects, engineers, consultants, attorneys and accountants, needed for the completion of the construction, repairs, or reconstruction; and carrying costs such as property taxes, building permits, additional interest on loans, realty taxes, and insurance premiums over and above normal expenses.

**§ A.2.5 Other Optional Insurance.**

The Owner shall purchase and maintain the insurance selected below.

*(Select the types of insurance the Owner is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance.)*

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User Notes:

(1785684578)

[ ] § A.2.5.1 Cyber Security Insurance for loss to the Owner due to data security and privacy breach, including costs of investigating a potential or actual breach of confidential or private information. (Indicate applicable limits of coverage or other conditions in the fill point below.)

[ ] § A.2.5.2 Other Insurance (List below any other insurance coverage to be provided by the Owner and any applicable limits.)

Coverage	Limits
----------	--------

### ARTICLE A.3 CONTRACTOR'S INSURANCE AND BONDS

#### § A.3.1 General

§ A.3.1.1 Certificates of Insurance. The Contractor shall provide certificates of insurance acceptable to the Owner evidencing compliance with the requirements in this Article A.3 at the following times: (1) prior to commencement of the Work; (2) upon renewal or replacement of each required policy of insurance; and (3) upon the Owner's written request. An additional certificate evidencing continuation of commercial liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment and thereafter upon renewal or replacement of such coverage until the expiration of the periods required by Section A.3.2.1 and Section A.3.3.1. The certificates will show the Owner as an additional insured on the Contractor's Commercial General Liability and excess or umbrella liability policy or policies.

§ A.3.1.2 Deductibles and Self-Insured Retentions. The Contractor shall disclose to the Owner any deductible or self-insured retentions applicable to any insurance required to be provided by the Contractor.

§ A.3.1.3 Additional Insured Obligations. To the fullest extent permitted by law, the Contractor shall cause the commercial general liability coverage to include (1) the Owner, the Architect, and the Architect's consultants as additional insureds for claims caused in whole or in part by the Contractor's negligent acts or omissions during the Contractor's operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor's negligent acts or omissions for which loss occurs during completed operations. The additional insured coverage shall be primary and non-contributory to any of the Owner's general liability insurance policies and shall apply to both ongoing and completed operations. To the extent commercially available, the additional insured coverage shall be no less than that provided by Insurance Services Office, Inc. (ISO) forms CG 20 10 07 04, CG 20 37 07 04, and, with respect to the Architect and the Architect's consultants, CG 20 32 07 04.

#### § A.3.2 Contractor's Required Insurance Coverage

§ A.3.2.1 The Contractor shall purchase and maintain the following types and limits of insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

*(If the Contractor is required to maintain insurance for a duration other than the expiration of the period for correction of Work, state the duration.)*

#### § A.3.2.2 Commercial General Liability

§ A.3.2.2.1 Commercial General Liability insurance for the Project written on an occurrence form with policy limits of not less than (\$ ) each occurrence, (\$ ) general aggregate, and (\$ ) aggregate for products-completed operations hazard, providing coverage for claims including

- .1 damages because of bodily injury, sickness or disease, including occupational sickness or disease, and death of any person;
- .2 personal injury and advertising injury;
- .3 damages because of physical damage to or destruction of tangible property, including the loss of use of such property;

- 4 bodily injury or property damage arising out of completed operations; and
- 5 the Contractor's indemnity obligations under Section 3.18 of the General Conditions.

§ A.3.2.2.2 The Contractor's Commercial General Liability policy under this Section A.3.2.2 shall not contain an exclusion or restriction of coverage for the following:

- 1 Claims by one insured against another insured, if the exclusion or restriction is based solely on the fact that the claimant is an insured, and there would otherwise be coverage for the claim.
- 2 Claims for property damage to the Contractor's Work arising out of the products-completed operations hazard where the damaged Work or the Work out of which the damage arises was performed by a Subcontractor.
- 3 Claims for bodily injury other than to employees of the insured.
- 4 Claims for indemnity under Section 3.18 of the General Conditions arising out of injury to employees of the insured.
- 5 Claims or loss excluded under a prior work endorsement or other similar exclusionary language.
- 6 Claims or loss due to physical damage under a prior injury endorsement or similar exclusionary language.
- 7 Claims related to residential, multi-family, or other habitational projects, if the Work is to be performed on such a project.
- 8 Claims related to roofing, if the Work involves roofing.
- 9 Claims related to exterior insulation finish systems (EIFS), synthetic stucco or similar exterior coatings or surfaces, if the Work involves such coatings or surfaces.
- 10 Claims related to earth subsidence or movement, where the Work involves such hazards.
- 11 Claims related to explosion, collapse and underground hazards, where the Work involves such hazards.

§ A.3.2.3 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than (\$ ) per accident, for bodily injury, death of any person, and property damage arising out of the ownership, maintenance and use of those motor vehicles along with any other statutorily required automobile coverage.

§ A.3.2.4 The Contractor may achieve the required limits and coverage for Commercial General Liability and Automobile Liability through a combination of primary and excess or umbrella liability insurance, provided such primary and excess or umbrella insurance policies result in the same or greater coverage as the coverages required under Section A.3.2.2 and A.3.2.3, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require the exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ A.3.2.5 Workers' Compensation at statutory limits.

§ A.3.2.6 Employers' Liability with policy limits not less than (\$ ) each accident, (\$ ) each employee, and (\$ ) policy limit.

§ A.3.2.7 Jones Act, and the Longshore & Harbor Workers' Compensation Act, as required, if the Work involves hazards arising from work on or near navigable waterways, including vessels and docks

§ A.3.2.8 If the Contractor is required to furnish professional services as part of the Work, the Contractor shall procure Professional Liability insurance covering performance of the professional services, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

§ A.3.2.9 If the Work involves the transport, dissemination, use, or release of pollutants, the Contractor shall procure Pollution Liability insurance, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

§ A.3.2.10 Coverage under Sections A.3.2.8 and A.3.2.9 may be procured through a Combined Professional Liability and Pollution Liability insurance policy, with combined policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

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§ A.3.2.11 Insurance for maritime liability risks associated with the operation of a vessel, if the Work requires such activities, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

§ A.3.2.12 Insurance for the use or operation of manned or unmanned aircraft, if the Work requires such activities, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate.

**§ A.3.3 Contractor's Other Insurance Coverage**

§ A.3.3.1 Insurance selected and described in this Section A.3.3 shall be purchased from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Contractor shall maintain the required insurance until the expiration of the period for correction of Work as set forth in Section 12.2.2 of the General Conditions, unless a different duration is stated below:

*(If the Contractor is required to maintain any of the types of insurance selected below for a duration other than the expiration of the period for correction of Work, state the duration.)*

§ A.3.3.2 The Contractor shall purchase and maintain the following types and limits of insurance in accordance with Section A.3.3.1.

*(Select the types of insurance the Contractor is required to purchase and maintain by placing an X in the box(es) next to the description(s) of selected insurance. Where policy limits are provided, include the policy limit in the appropriate fill point.)*

§ A.3.3.2.1 Property insurance of the same type and scope satisfying the requirements identified in Section A.2.3, which, if selected in this section A.3.3.2.1, relieves the Owner of the responsibility to purchase and maintain such insurance except insurance required by Section A.2.3.1.3 and Section A.2.3.3. The Contractor shall comply with all obligations of the Owner under Section A.2.3 except to the extent provided below. The Contractor shall disclose to the Owner the amount of any deductible, and the Owner shall be responsible for losses within the deductible. Upon request, the Contractor shall provide the Owner with a copy of the property insurance policy or policies required. The Owner shall adjust and settle the loss with the insurer and be the trustee of the proceeds of the property insurance in accordance with Article 11 of the General Conditions unless otherwise set forth below:

*(Where the Contractor's obligation to provide property insurance differs from the Owner's obligations as described under Section A.2.3, indicate such differences in the space below. Additionally, if a party other than the Owner will be responsible for adjusting and settling a loss with the insurer and acting as the trustee of the proceeds of property insurance in accordance with Article 11 of the General Conditions, indicate the responsible party below.)*

§ A.3.3.2.2 Railroad Protective Liability Insurance, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate, for Work within fifty (50) feet of railroad property.

§ A.3.3.2.3 Asbestos Abatement Liability Insurance, with policy limits of not less than (\$ ) per claim and (\$ ) in the aggregate, for liability arising from the encapsulation, removal, handling, storage, transportation, and disposal of asbestos-containing materials.

§ A.3.3.2.4 Insurance for physical damage to property while it is in storage and in transit to the construction site on an "all-risks" completed value form.

§ A.3.3.2.5 Property insurance on an "all-risks" completed value form, covering property owned by the Contractor and used on the Project, including scaffolding and other equipment.

§ A.3.3.2.6 Other Insurance  
*(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)*

SECTION 00600

FORMS AND CERTIFICATES

1.01 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions and of Division 1, General Requirements govern all work in this Section.

1.02 GENERAL

- A. The following forms will be used during the construction of this Project. Some documents are included. Additional documents are included by reference and are made a part of this Project Manual as if bound herein. It shall be the Contractor's responsibility to obtain copies of the AIA forms for his use.

1.03 FORMS AND CERTIFICATES

- A. Bid-related Documents
  1. Advertisement for Bids
  2. Information for Bidders
  3. Bid Form
  4. Bid Bond
  5. Arkansas Performance and Payment Bond
- B. Submit to the Owner for Bidding:
  1. Bid Form
  2. Bid Bond
  3. Contractor's Qualification Statement, AIA Document A305.
    - a. Contractor may submit either the 1986 or 2020 Edition.
- C. File with Owner prior to starting work:
  1. Certificate of Insurance: Document provided by Insurance Underwriter.
  2. Arkansas Performance and Payment Bond
- D. Request for Information (RFI): AIA Document G716, 2004 Edition.
- E. Construction Change Directive: AIA Document G714, 2017.
- F. Construction Changes (Cost and/or Time): Change Order, AIA Document G701; 2017 Edition.
- G. Contractor to Submit for Progress Payments and Final Payment: Application and Certificate for Payment, AIA Document G702 and G703; 1992 Edition.
- H. Architect will prepare at Substantial Completion form: Certificate of Substantial Completion, AIA Document G704; 2017 Edition.
- I. Closeout Documents to be filed with Owner in accordance with Section 01700.
  1. Contractor's Affidavit of Payment of Debts and Claims, AIA Document G706; 1994 Edition.
  2. Contractor's Affidavit of Release of Liens, AIA Document G706A; 1994 Edition.
  3. Consent of Surety to Final Payment, AIA Document G707; 1994 Edition.

END OF SECTION



ADVERTISEMENT FOR BIDS

Separate sealed bids for Reconstruction of the Trumann Fire Station will be received by the City of Trumann and be submitted to Trumann City Hall, 825 AR Hwy. 463 N, Trumann, AR 72472, until Ten o'clock A.M. on Thursday, August 31, 2023.

Copies of the Contract Documents must be obtained at the office of Miller-Newell Engineers, Inc., 510 Third Street, Newport, AR 72112. Cost is \$150 with a \$75 refund if plans are returned in usable condition within 14 days of bidding.

The Owner reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit with his bid security in the amount, form and subject to the conditions provided in the Information for Bidders.

In accordance with Act 150 of 1965, as amended, all bidders shall conform to the requirements of the Arkansas State Licensing Law for Contractors.

No bidder may withdraw his bid within 60 days after the actual date of the opening thereof.

This Advertisement for Bids is being published by and paid for by the following:

City of Trumann  
825 AR Hwy. 463 N  
Trumann, AR 72472

The amount of this publication is \$ \_\_\_\_\_.

City of Trumann  
By: Jay Paul Woods  
Date: July 31, 2023





## INFORMATION FOR BIDDERS

Bids will be received by the City of Trumann (herein called the "OWNER"), and be submitted to Trumann City Hall, 825 AR Hwy. 463 N, Trumann, AR 72472, until Ten o'clock A.M. on Thursday, August 31, 2023 and will be publicly read aloud. Each bid must be submitted in a sealed envelope, addressed to Trumann City Hall, 825 AR Hwy. 463 N, Trumann, AR 72472. Each sealed envelope containing a bid must be plainly marked on the outside as RECONSTRUCTION OF THE TRUMANN FIRE STATION and the envelope should bear on the outside the name of the bidder, his address, his license number, if applicable, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed to: Trumann City Hall, 825 AR Hwy. 463 N, AR 72472

If forwarded by UPS or FedEx, the sealed envelope containing the bid must be enclosed in another envelope addressed to: Trumann City Hall, 825 AR Hwy. 463 N, Trumann, AR 72472.

Bids must be made on the required bid form. All blank spaces for bid prices must be filled in, in ink or typewritten, and the bid form must be fully completed and executed when submitted. Only one copy of the bid form is required.

The Owner may waive any informalities or minor defects or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 60 days after the actual date of the opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

Bidders must satisfy themselves of the accuracy of the estimated quantities in the bid schedule by examination of the site and a review of the drawings and specifications, including any and all addenda. After bids have been submitted, the bidder shall not assert that there was a misunderstanding concerning the quantities of work or of the nature of the work to be done.

The Owner shall provide to bidders, prior to bidding, all information which is pertinent to and delineates and describes the land owned and rights-of-way acquired or to be acquired.

The Contract Documents contain the provisions required for the construction of the project. Information obtained from an officer, agent or employee of the Owner or any other person shall not affect the risks or obligations assumed by the Contractor or relieve him from fulfilling any of the conditions of the contract.

Each bid must be accompanied by a completed Contractor's Qualification Statement, AIA Document A305. The Qualifications Statement may be used as a factor in determining the successful bidder.

Each bid must be accompanied by a Bid Bond payable to the Owner for five percent of the total amount of the bid. As soon as the bid prices have been compared, the Owner will return the bonds of all except the three lowest responsible bidders. When the Agreement is executed, the bonds of the two remaining unsuccessful bidders will be returned. The Bid Bond of the successful bidder will be retained until the Payment Bond and Performance Bond have been executed and approved, after which it will be returned. A certified check may be used in lieu of a Bid Bond.

A Performance Bond and Payment Bond, each in the amount of 100 percent of the contract price, with a corporate surety approved by the Owner, will be required for the faithful performance of the contract.

Attorney-in-fact who signs Bid Bonds or Payment Bonds or Performance Bonds must file with each bond a certified and effective dated copy of their power of attorney.

The party to whom the contract is awarded will be required to execute the Agreement and obtain the Performance Bond and Payment Bond within ten (10) calendar days from the date when the Notice of Award is delivered to the bidder. The Notice of Award shall be accompanied by the necessary Agreement and bond forms. In case of failure of the bidder to execute the Agreement, the Owner may at his option consider the bidder in default, in which case the Bid Bond accompanying the proposal shall become the property of the Owner.

The Owner, within ten (10) days of receipt of acceptable Performance Bond, Payment Bond and Agreement signed by the party to whom the Agreement was awarded, shall sign the Agreement and return to such party an executed duplicate of the Agreement. Should the Owner not execute the Agreement within such period, the bidder may by written notice withdraw his signed Agreement. Such notice of withdrawal shall be effective upon receipt of the notice by the Owner.

The Notice to Proceed shall be issued within ten (10) days of the execution of the Agreement by the Owner or Owner's representative. Should there be reasons why the Notice to Proceed cannot be issued within such period, the time may be extended by mutual agreement between the Owner and Contractor. If the Notice to Proceed has not been issued within the ten (10) day period or within the period mutually agreed upon, the Contractor may terminate the Agreement without further liability on the part of either party.

With their bid, the bidder shall submit a completed AIA Document A305 - Contractor's Qualifications Statement. The Owner and Architect shall make such investigations as they deem necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the Owner all additional information and data for this purpose as the Owner may request. The Owner reserves the right to reject any bid on 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 Agreement and to complete the work contemplated therein. A conditional or qualified bid will not be accepted. Award will be made to the lowest responsible bidder.

All applicable laws, ordinances and the rules and regulations of all authorities having jurisdiction over construction of the project shall apply to the contract throughout.

Each bidder is responsible for inspecting the site and for reading and being thoroughly familiar with the Contract Documents. The failure or omission of any bidder to do any of the foregoing shall in no way relieve any bidder from any obligation in respect to his bid.

The low bidder shall supply the names and addresses of major material suppliers and subcontractors when requested to do so by the Owner.

The Architect is HORD ARCHITECTS, 66 Monroe Avenue, Suite 105, Memphis, Tennessee 38103.  
The Engineer is MILLER-NEWELL ENGINEERS, INC., 510 Third Street, Newport, Arkansas 72112.

BID FORM

DATE: \_\_\_\_\_ 2023

Proposal of \_\_\_\_\_ (hereinafter called "Bidder"), a corporation, organized and existing under the laws of the State of Arkansas; a partnership; an individual doing business as \_\_\_\_\_.

TO: CITY OF TRUMANN  
(Hereinafter called "Owner")

GENTLEMEN:

The Bidder, in compliance with your invitation for bids for the furnishing of materials and/or labor for Reconstruction of the Trumann Fire station having examined the plans and specifications with the related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project, including the availability of materials, hereby proposes to furnish all materials and supplies in accordance with the Contract Documents, within the time set forth therein, and at the lump sum price stated below. These prices are to cover all expenses incurred in furnishing the equipment/materials required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in written "Notice to Proceed" by the Architect and to fully complete the project within Two Hundred and Seventy (270) consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated damages, the sum of \$300.00 for each calendar day thereafter as hereinafter provided in the General Conditions.

Bidder acknowledges receipt of the following addenda:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Bidder agrees to perform all the work required and to furnish all material required to be furnished to cover the finished work as described in the Specifications and as shown on the Plans for the following lump sum unit prices:

**BID SCHEDULE**

BASE BID:

ALL WORK REQUIRED FOR THE RECONSTRUCTION OF THE EXISTING FIRE STATION FOR  
A TOTAL LUMP SUM BID OF:

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

**ALTERNATES**

The Bidder includes the following Alternates, as specified, and will adjust the Base Bid accordingly:

- 1. Deductive Alternate #1: Alternate #1 total: \$ \_\_\_\_\_  
State the amount to be deducted from the Base Bid for omitting the Safe Room and all associated building work. Site preparation, grading, and drainage shall be part of the base bid and remain in the contract.
- 2. Deductive Alternate #2: Alternate #2 total: \$ \_\_\_\_\_  
State the amount to be deducted from the Base Bid for omitting the cleaning of the asphalt parking area and omitting the installation of the asphalt seal coat on the asphalt parking area.
- 3. Deductive Alternate #3: Alternate #3 total: \$ \_\_\_\_\_  
State the amount to be deducted from the Base Bid for omitting Folding Door Type G and steel jamb columns, and installing fully glazed overhead doors and operators similar to Door Type F.
- 4. Deductive Alternate #4: Alternate #4 total: \$ \_\_\_\_\_  
State the amount to be deducted from the Base Bid to install metal wall panels in lieu of brick veneer on the South side of the Truck Bays.

If the Owner desires to accept the alternates, they shall be taken in the following order: 1, 2, 3, 4, per specifications Section 01030, Article 1.01.B.

In submitting this bid it is understood that the right is reserved by the Owner to reject any or all bids. No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of the Owner.

Upon receipt of written notice of the acceptance of this bid, Bidder will execute the formal contract attached within 10 days and deliver a surety bond or bonds as required by the General Conditions.

The bid security attached in the sum of:

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_) is to become the property of the Owner in the event the contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

RESPECTFULLY SUBMITTED,

BY: \_\_\_\_\_  
Signature

\_\_\_\_\_ (SEAL if bid is by corporation)  
Title

Business address:

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Contractor's Arkansas  
License Number



BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned \_\_\_\_\_, as Principal, and \_\_\_\_\_, as Surety, are held and firmly bound unto, as Owner, in the penal sum of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), for payment of which sum well and truly to be made, we hereby jointly and severally bind ourselves, our successors and assigns.

SIGNED this \_\_\_\_\_ day of \_\_\_\_\_, 2023.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal has submitted to a certain BID, attached hereto and made a part hereof, to enter into a contract in writing for: RECONSTRUCTION OF THE TRUMANN FIRE STATION.

NOW, THEREFORE,

- (a) If said BID shall be rejected, or
- (b) If said BID shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said BID) and shall furnish a BOND for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said BID, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its BOND shall be in no way impaired or affected by any extension of the time within which the OWNER may accept such BID; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the date and year first set forth above.

\_\_\_\_\_  
Principal

\_\_\_\_\_  
Surety

By: \_\_\_\_\_

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the project is located.





ARKANSAS PERFORMANCE AND PAYMENT BOND  
(14-604 Arkansas Statutes)

KNOW ALL MEN BY THESE PRESENTS, that we \_\_\_\_\_, a  
\_\_\_\_\_, hereinafter called "Principal" and \_\_\_\_\_, of  
\_\_\_\_\_, hereinafter called the "Surety," are held and firmly bound unto  
The City of Trumann, Arkansas, hereinafter called "Owner," in the penal sum of:  
\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)  
in lawful money of the United States, for payment of which sum well and truly to be made, said  
principals and surety bind themselves, their heirs, administrators, executors, successors and assigns,  
jointly and severally, by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain  
contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 2023 a copy of  
which is attached and made a part hereof, for:

RECONSTRUCTION OF THE TRUMANN FIRE STATION

NOW, THEREFORE, if the Principal shall well, truly and faithfully per-form its duties, all the  
undertakings, covenants, terms and conditions, and agreement of said contract during the original term  
thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the  
Surety, and if he shall satisfy all claims and demands incurred under such contract, and shall fully  
indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of  
failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may  
incur in making good any default, and shall promptly make payment to all persons, firms, subcontractors  
and corporations furnishing materials for or performing labor in the prosecution of the work provided  
for in such contract, and any authorized extension or modification thereof, all amounts due for but not  
limited to, materials lubricants, oil, gasoline, coal and coke, repair on machinery, equipment and tolls,  
consumed or used in connection with the construction of said work, fuel oil, camp equipment, food for  
men, feed for animals, premium for bonds and liability and worker's compensation insurance, rentals on  
machinery, equipment and draft animals; also for taxes or payments due the State of Arkansas or any  
political subdivisions thereof which shall have arisen on account of or in connection with the wages  
earned by workmen covered by the bond; and for all labor, performing in such work whether by  
subcontractor or otherwise, then this obligation shall be void, otherwise to remain in full force and  
effect.

The Surety agrees the terms of this bond shall cover the payment by the Principal of not less than the  
prevailing hourly rate of wages as found by the Arkansas Department of Labor or as determined by the  
court on appeal to all workmen performing work under the contract.

PROVIDED, FURTHER, THAT THE SAID surety, for value received, hereby stipulates and agrees that  
no change, extension of time, alteration or addition to the terms of the contract or to the work to be  
performed thereunder of the specifications accompanying the same shall in any way affect its obligation  
on this bond, and it does hereby waive notice of any such change, extension of time, alteration or  
addition to the terms of the contract as to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is execution in six (6) counterparts, each of which shall be deemed an original, this \_\_\_\_\_ day of \_\_\_\_\_, 2023.

Principal

ATTEST:

By: \_\_\_\_\_

\_\_\_\_\_  
Secretary

\_\_\_\_\_  
Address

\_\_\_\_\_  
Witness as to Principal

Address:  
\_\_\_\_\_  
\_\_\_\_\_

Surety

ATTEST:

By: \_\_\_\_\_

Attorney-In-Fact

\_\_\_\_\_  
Secretary (Seal)

\_\_\_\_\_  
Address

\_\_\_\_\_  
Witness

Address:  
\_\_\_\_\_  
\_\_\_\_\_

- NOTE: (1) Date of Bond must not be prior to date of Contract.  
(2) This bond must be filed with the Circuit Clerk of the County where the work is to be performed prior to the start of construction.

# AIA<sup>®</sup> Document A305™ – 1986

## Contractor's Qualification Statement

The Undersigned certifies under oath that the information provided herein is true and sufficiently complete so as not to be misleading.

SUBMITTED TO:

ADDRESS:

SUBMITTED BY:

NAME:

ADDRESS:

PRINCIPAL OFFICE:

- Corporation
- Partnership
- Individual
- Joint Venture
- Other

NAME OF PROJECT: *(if applicable)*

TYPE OF WORK: *(file separate form for each Classification of Work)*

- General Construction
- HVAC
- Electrical
- Plumbing
- Other: *(Specify)*

### § 1 ORGANIZATION

§ 1.1 How many years has your organization been in business as a Contractor?

§ 1.2 How many years has your organization been in business under its present business name?

§ 1.2.1 Under what other or former names has your organization operated?

§ 1.3 If your organization is a corporation, answer the following:

§ 1.3.1 Date of incorporation:

§ 1.3.2 State of incorporation:

§ 1.3.3 President's name:

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

This form is approved and recommended by the American Institute of Architects (AIA) and The Associated General Contractors of America (AGC) for use in evaluating the qualifications of contractors. No endorsement of the submitting party or verification of the information is made by AIA or AGC.

§ 1.3.4 Vice-president's name(s)

§ 1.3.5 Secretary's name:

§ 1.3.6 Treasurer's name:

§ 1.4 If your organization is a partnership, answer the following:

§ 1.4.1 Date of organization:

§ 1.4.2 Type of partnership (if applicable):

§ 1.4.3 Name(s) of general partner(s)

§ 1.5 If your organization is individually owned, answer the following:

§ 1.5.1 Date of organization:

§ 1.5.2 Name of owner:

§ 1.6 If the form of your organization is other than those listed above, describe it and name the principals:

## § 2 LICENSING

§ 2.1 List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.

§ 2.2 List jurisdictions in which your organization's partnership or trade name is filed.

## § 3 EXPERIENCE

§ 3.1 List the categories of work that your organization normally performs with its own forces.

§ 3.2 Claims and Suits. (If the answer to any of the questions below is yes, please attach details.)

§ 3.2.1 Has your organization ever failed to complete any work awarded to it?

§ 3.2.2 Are there any judgments, claims, arbitration proceedings or suits pending or outstanding against your organization or its officers?

§ 3.2.3 Has your organization filed any law suits or requested arbitration with regard to construction contracts within the last five years?

§ 3.3 Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? (If the answer is yes, please attach details.)

§ 3.4 On a separate sheet, list major construction projects your organization has in progress, giving the name of project, owner, architect, contract amount, percent complete and scheduled completion date.

§ 3.4.1 State total worth of work in progress and under contract:

§ 3.5 On a separate sheet, list the major projects your organization has completed in the past five years, giving the name of project, owner, architect, contract amount, date of completion and percentage of the cost of the work performed with your own forces.

§ 3.5.1 State average annual amount of construction work performed during the past five years:

§ 3.6 On a separate sheet, list the construction experience and present commitments of the key individuals of your organization.

#### § 4 REFERENCES

§ 4.1 Trade References:

§ 4.2 Bank References:

§ 4.3 Surety:

§ 4.3.1 Name of bonding company:

§ 4.3.2 Name and address of agent:

#### § 5 FINANCING

§ 5.1 Financial Statement.

§ 5.1.1 Attach a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);

Net Fixed Assets;

Other Assets;

Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes);

Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

§ 5.1.2 Name and address of firm preparing attached financial statement, and date thereof:

§ 5.1.3 Is the attached financial statement for the identical organization named on page one?

§ 5.1.4 If not, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

§ 5.2 Will the organization whose financial statement is attached act as guarantor of the contract for construction?

§ 6 SIGNATURE

§ 6.1 Dated at this day of

Name of Organization:

By:

Title:

§ 6.2

M being duly sworn deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading.

Subscribed and sworn before me this day of

Notary Public:

My Commission Expires:

SECTION 00700

AIA GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

- A. The Contractor and all persons whom he or the Owner may employ or contract to do the work on this project, shall be bound by these General Conditions as if repeated in each Section of this Project Manual.
- B. The General Conditions of the Contract for Construction, AIA Document A201, 2017 Edition, is hereby made a part of this Project Manual. A sample copy is attached for reference.
- C. The failure on part of the Contractor to familiarize himself, or examine these Documents, in no way relieves him of the responsibilities and conditions set out herein.

END OF SECTION





SECTION 00800

SUPPLEMENTARY CONDITIONS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions and of Division I, General Requirements govern all work in this Section.

1.02 SUPPLEMENTARY CONDITIONS

- A. The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction," AIA Document A201, 2017 Edition. Where any Article of the General Conditions is modified or any Paragraph, Subparagraph or Clause thereof is modified or deleted by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

1.03 ARTICLE 1; GENERAL PROVISIONS

- A. Add to 1.1 the following Subparagraph 1.1.9:

1.1.9 Products

The term "product" as used in these Specifications and Supplementary Conditions includes materials, systems and equipment.

1.04 ARTICLE 3; CONTRACTOR

- A. Add to 3.2 the following Subparagraph 3.2.5:

3.2.5 If there are any conflicts between portions of the Contract Documents, not corrected by Addendum before the signing of the Contract, the Architect shall be notified immediately upon discovery of such conflict for an interpretation.

- B. Add to 3.2 the following Subparagraph 3.2.6:

3.2.6 Submission of proposal shall be deemed evidence that the Contractor or Subcontractor has examined the site and is familiar with conditions under which the Work will be done. Extra payment will not be authorized for work that could have been determined by careful examination of the site and conditions.

- C. Add to 3.4 the following Subparagraphs 3.4.4 and 3.4.5:

3.4.4 The Contractor shall disclose the existence and extent of financial interests, whether direct or indirect, he has in subcontractors and material suppliers which he may propose for the Project.

3.4.5 Products are generally specified by ASTM or other reference standards, and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. When only one product and manufacturer is specified, this is the basis of the Contract, without substitution or exception.

D. Add to 3.7 the following Subparagraphs 3.7.6 and 3.7.7:

3.7.6 The Contractor or Subcontractor shall pay for any damages to sidewalks, streets or other public utilities.

3.7.7 The Contractor or Construction Manager shall secure all certificates of inspection which may be required by authorities having jurisdiction over the Work. These shall be delivered to the Architect upon completion of the Work. Certificates of Use and Occupancy shall be obtained by the Contractor or Construction Manager, as required by the Local Building Code or state agency, as a condition precedent to final payment.

E. Add to 3.12 the following Subparagraphs 3.12.11 and 3.12.12:

3.12.11 Shop drawings and samples shall be dated and marked to show the names of the Project, Architect, Contractor, originating Subcontractor, manufacturer or supplier and separate details if pertinent. Shop drawings shall completely identify Specification section and location at which materials or equipment are to be installed. Reproductions of Contract Drawings may be acceptable as part of shop drawings, but only when specifically authorized in writing by the Architect.

3.12.12 Unless otherwise specified, the number of samples and the number of shop drawings which the Contractor shall submit and, if necessary, resubmit shall be five (5).

#### 1.05 ARTICLE 4; ARCHITECT

A. In Subparagraph 4.2.4, delete the first two sentences and substitute the following in lieu thereof:

The Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Project.

B. Add to 4.2 the following Subparagraph 4.2.15:

4.2.15 No changes shall be made to the Drawings or Project Manual without written approval from the Architect.

#### 1.06 ARTICLE 5; SUBCONTRACTORS

A. Subparagraph 5.2.1 is modified by the following provisions:

Not later than five (5) days from the Contract Date, the Contractor or Construction Manager shall provide a list of all subcontractors and major material suppliers that he proposes to use. After this list has been approved, no deviations will be permitted, unless by written approval by the Architect and Owner.

The Owner shall have the right to review any and all bids from material suppliers and subcontractors and their agreements before being executed.

#### 1.07 ARTICLE 7; CHANGES IN THE WORK

A. In Subparagraph 7.3.3 delete Clause .1 and substitute the following in lieu thereof:

7.3.3.1 by lump sum properly itemized, which shall show the actual verified cost of the Work, plus overhead and profit.

B. In Subparagraph 7.3.4 in the first sentence, delete the words "a reasonable amount" and substitute "an allowance for overhead and profit in accordance with Subparagraph 7.3.11 below" in lieu thereof.

- C. In Subparagraph 7.3.8, modify the first sentence to read:

The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost plus the associated Contractor's Fee, as confirmed by the Architect.

- D. Add to 7.3 the following Subparagraph 7.3.11:

7.3.11 In Article 7, the allowance for overhead and profit, included in the total cost to the Owner, shall be based on the following (or as provided in the Agreement Between the Owner and the Contractor):

7.3.11.1 for the Subcontractor or Contractor performing work with their own forces, the allowance shall be 10% overhead and 5.0% profit.

7.3.11.2 for the Contractor, for Work performed by the Contractor's Subcontractors, the allowance shall be 5.0% profit on the amount due the Subcontractor.

7.3.11.3 cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.4 of the General conditions.

7.3.11.4 in order to facilitate checking of quotations for extras or credits, all proposals shall be accompanied by a complete itemization of costs of all Work including labor, materials and equipment, plus the allowance for overhead and profit.

#### 1.08 ARTICLE 8; TIME

- A. Add to 8.1 the following Subparagraph 8.1.5:

8.1.5 As between the Owner and the Contractor: as to all acts or failures to act occurring prior to the relevant Date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such Date of Substantial Completion; as to all acts or failures to act occurring subsequent to the relevant Date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment.

#### 1.09 ARTICLE 9; PAYMENTS AND COMPLETION

- A. Omit the first two sentences of Subparagraph 9.2, and insert the following:

9.2 Within five (5) days after execution of the Contract, the Contractor or Construction Manager shall submit for approval, by the Owner and Architect, a breakdown of the Contract Sum. Prepare the breakdown on AIA Document G702 and G703. The breakdown shall be prepared in such a manner that each major item of work and each subcontracted item of work is shown as a single line item on the form.

- B. Add to Subparagraph 9.3.1 the following sentence:

Beginning with the second Application for Payment, the Contractor shall furnish with his application, certification that he has paid his subcontractors and major material suppliers the amounts drawn on the previous estimate for the respective items, or beginning with the first Application for Payment, partial lien waivers may be submitted and be conditional upon payment of amount billed. Partial Lien Waivers shall accompany all Applications for Payment.

- C. Add the following Paragraph 9.11 to Article 9:

9.11.1 The Contractor and the Contractor's surety, if any, shall be liable for and shall pay the Owner the sums hereinafter stipulated as liquidated damages for each calendar day of delay until the Work is substantially complete: Three hundred Dollars (\$300.00).

9.11.2 The Owner reserves the right to deduct liquidated damages set forth in Subparagraph 9.11.1 from amount due the Contractor or, at its option, to collect liquidated damages directly from the Contractor or Contractor's surety.

#### 1.10 ARTICLE 11; INSURANCE AND BONDS

A. Add to Subparagraph 11.1.1 the following sentences:

The Contractor or Construction Manager shall maintain throughout the life of this Contract, liability insurance written in a comprehensive form, satisfactory to the Owner in the following minimum requirements. These are minimum requirements, and the Contractor shall determine the amounts of coverage required to protect himself from claims and damages.

B. Add to Subparagraph 11.1.1 the following clauses:

11.1.1.1 Workmen's Compensation and Employer's Liability, Minimum Amounts: \$1,000,000 each accident; \$1,000,000 each employee; \$1,000,000 policy limit. Amounts shall be in compliance with State law.

11.1.1.2 Comprehensive General Liability, Minimum Amounts: \$2,000,000 general aggregate; \$2,000,000 products/completed operations hazard; \$1,000,000 personal injury; \$1,000,000 each occurrence; \$300,000 fire damage; \$10,000 medical expenses and personal injury.

11.1.1.3 Automobile Liability, Minimum Amount: \$1,000,000 combined single unit. Policy shall be comprehensive form including owned, hired and non-owned vehicles.

11.1.1.4 Umbrella Liability, Minimum Amount: Combined single limit of \$5,000,000.

11.1.1.5 The Contractor or Construction Manager shall file a Certificate of Insurance for all coverages prior to the commencement of construction.

C. Add to Subparagraph 11.1.2 the following Subparagraphs 11.1.2.1 and 11.1.2.2:

11.1.2.1 The Surety Bond shall be written by a Surety Company licensed to transact business in the State where the Project is located. The Surety Company shall be acceptable to the Owner, Architect and the Owner's Lending Institution. The Contractor shall verify the Surety Company's acceptability prior to the submittal of bids and shall be responsible for all costs resulting from the rejection of any proposed Surety Company.

11.1.2.2 The Bond shall be delivered to the Owner within 5 days from the date of the Construction Agreement. The obtaining by the Contractor of the Bond shall be a condition precedent to the effectuation of the Contract between the Owner and the Contractor. The Surety Bond shall be AIA Document A312.

END OF SECTION

# AIA® Document A201® – 2017

## General Conditions of the Contract for Construction

for the following PROJECT:  
*(Name and location or address)*

THE OWNER:  
*(Name, legal status and address)*

THE ARCHITECT:  
*(Name, legal status and address)*

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

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

#### § 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

#### § 1.1.2 The Contract

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

#### § 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### § 1.1.5 The Drawings

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

#### § 1.1.6 The Specifications

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

#### § 1.1.7 Instruments of Service

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

#### § 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

### § 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

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

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

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

### § 1.3 Capitalization

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

### § 1.4 Interpretation

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

### § 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

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

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

### § 1.6 Notice

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

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

### § 1.7 Digital Data Use and Transmission

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

### § 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

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G202™-2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

## ARTICLE 2 OWNER

### § 2.1 General

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

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

### § 2.2 Evidence of the Owner's Financial Arrangements

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

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

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

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

### § 2.3 Information and Services Required of the Owner

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

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



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

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

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

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

#### § 2.4 Owner's Right to Stop the Work

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

#### § 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### ARTICLE 3 CONTRACTOR

#### § 3.1 General

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

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

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

#### § 3.2 Review of Contract Documents and Field Conditions by Contractor

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

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§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### § 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

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

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

### § 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

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

### § 3.5 Warranty

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

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

### § 3.6 Taxes

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

### § 3.7 Permits, Fees, Notices and Compliance with Laws

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

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

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

### § 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

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

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**§ 3.8 Allowances**

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

**§ 3.8.2** Unless otherwise provided in the Contract Documents,

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

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

**§ 3.9 Superintendent**

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

**§ 3.9.2** The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

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

**§ 3.10 Contractor's Construction and Submittal Schedules**

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

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

**§ 3.10.3** The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

**§ 3.11 Documents and Samples at the Site**

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

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delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

**§ 3.12 Shop Drawings, Product Data and Samples**

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

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

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

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

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

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

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will

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specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

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

### § 3.13 Use of Site

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

### § 3.14 Cutting and Patching

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

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

### § 3.15 Cleaning Up

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

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

### § 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

### § 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

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### § 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

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

### § 4.2 Administration of the Contract

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

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

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### § 4.2.4 Communications

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

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

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

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

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

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

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

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

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

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

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## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

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

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

### § 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

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

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

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

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

### § 5.3 Subcontractual Relations

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

### § 5.4 Contingent Assignment of Subcontracts

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

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

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

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

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

## ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

### § 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

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

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

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

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

### § 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

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

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

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

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

**§ 6.3 Owner's Right to Clean Up**

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

**ARTICLE 7 CHANGES IN THE WORK**

**§ 7.1 General**

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

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

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

**§ 7.2 Change Orders**

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

**§ 7.3 Construction Change Directives**

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

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

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

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- 1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- 2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- 3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- 4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- 5 Costs of supervision and field office personnel directly attributable to the change.

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

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

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

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

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

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

#### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

### ARTICLE 8 TIME

#### § 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

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

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

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

### § 8.2 Progress and Completion

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

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

### § 8.3 Delays and Extensions of Time

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

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

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

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

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

### § 9.2 Schedule of Values

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

### § 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

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

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

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

#### § 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

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

#### § 9.5 Decisions to Withhold Certification

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

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

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

#### § 9.6 Progress Payments

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

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

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

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

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

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

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

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

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### § 9.7 Failure of Payment

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

### § 9.8 Substantial Completion

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

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

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

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

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

### § 9.9 Partial Occupancy or Use

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

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

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

**§ 9.10 Final Completion and Final Payment**

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

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

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

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

**ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY**

**§ 10.1 Safety Precautions and Programs**

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

**§ 10.2 Safety of Persons and Property**

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

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- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

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

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

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

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

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

#### § 10.2.8 Injury or Damage to Person or Property

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

#### § 10.3 Hazardous Materials and Substances

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

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

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promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

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

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

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

#### § 10.4 Emergencies

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

### ARTICLE 11 INSURANCE AND BONDS

#### § 11.1 Contractor's Insurance and Bonds

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

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

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

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act

or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

## § 11.2 Owner's Insurance

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

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

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

## § 11.3 Waivers of Subrogation

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

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

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

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

#### **§11.5 Adjustment and Settlement of Insured Loss**

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

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

### **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

#### **§ 12.1 Uncovering of Work**

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

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

#### **§ 12.2 Correction of Work**

##### **§ 12.2.1 Before Substantial Completion**

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

##### **§ 12.2.2 After Substantial Completion**

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

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§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

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

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

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

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

### § 12.3 Acceptance of Nonconforming Work

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

## ARTICLE 13 MISCELLANEOUS PROVISIONS

### § 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

### § 13.2 Successors and Assigns

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

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

### § 13.3 Rights and Remedies

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

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

### § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and

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approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

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

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

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

#### § 13.5 Interest

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

### ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

#### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

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

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

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

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

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

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

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

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

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

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§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

## ARTICLE 15 CLAIMS AND DISPUTES

### § 15.1 Claims

#### § 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

#### § 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

#### § 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

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

#### § 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

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

#### § 15.1.5 Claims for Additional Cost

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

#### § 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

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

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### § 15.1.7 Waiver of Claims for Consequential Damages

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

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

### § 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

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

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

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

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

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

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

Init.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

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

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

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

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

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

### § 15.4 Arbitration

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

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

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

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

Init.

**§ 15.4.4 Consolidation or Joinder**

**§ 15.4.4.1** Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

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

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

Init.

SECTION 00850

SCHEDULE OF DRAWINGS

*Unless otherwise noted, all drawings are dated July 31, 2023*

No.            Drawing

T101        COVER SHEET  
T102        LIFE SAFETY PLAN & FIXTURE HEIGHT LEGEND

ARCHITECTURAL

A101        FLOOR PLAN  
A102        ROOF PLAN  
A103        REFLECTED CEILING PLAN  
A201        ELEVATIONS  
A301        BUILDING SECTIONS  
A401        WALL SECTIONS  
A402        WALL SECTIONS  
A403        WALL SECTIONS  
A404        WALL SECTIONS  
A405        WALL SECTIONS  
A406        WALL SECTIONS  
A407        WALL SECTIONS  
A408        WALL SECTIONS  
A501        ENLARGED PLANS & DETAILS  
A502        ENLARGED PLANS & DETAILS  
A503        MILLWORK SECTIONS  
A601        HEAD, JAMB, SILL DETAILS  
A602        HEAD, JAMB, SILL DETAILS  
A603        HEAD, JAMB, SILL DETAILS  
A604        EXTERIOR DETAILS  
A701        SCHEDULES  
A702        WALL TYPE AND FINISH SCHEDULES

STRUCTURAL

S101        NOTE SHEET  
S201        SLAB DIMENSION & JOINTING PLAN  
S202        FOUNDATION PLAN  
S301        FOUNDATION DETAILS  
S401        ROOF FRAMING PLAN  
S501        FRAMING DETAILS  
S502        FRAMING DETAILS

CIVIL

C101        SITE DEMO PLAN  
C102        PROPOSED SITE PLAN  
C103        SITE UTILITY PLAN  
C104        SITE GRADING PLAN  
C105        SITE PAVING PLAN  
C106        SITE DETAILS  
C107        SITE DETAILS

MECHANICAL / ELECTRICAL / FIRE PROTECTION

M101 MECHANICAL PLAN  
M102 MECHANICAL SCHEDULE  
M103 TRUCK BAY EXHAUST SYSTEM  
E101 LIGHTING PLAN  
E102 LIGHTING PLAN  
E103 LIGHTING PLAN  
E104 ELECTRICAL PLAN  
E105 ELECTRICAL PLAN  
E106 ELECTRICAL PLAN  
E107 ELECTRICAL SCHEMATICS  
E108 FIRE STATION ALERTING SYSTEM  
E109 FIRE STATION ALERTING SYSTEM DETAILS  
E110 ELECTRICAL NOTES AND DETAILS  
P101 PLUMBING PLAN - SANITARY SEWER  
P102 PLUMBING PLAN - GAS  
P103 PLUMBING PLAN - WATER  
P104 PLUMBING PLAN - WATER  
P105 PLUMBING RISER - WATER  
P106 PLUMBING RISER - GAS  
P107 PLUMBING RISER - SANITARY SEWER  
P108 PLUMBING NOTES  
FP1 FIRE PROTECTION NOTES AND DETAILS  
FP2 FIRE PROTECTION PLANS

END OF SECTION

SECTION 01010  
SUMMARY OF WORK

1.01 INCLUDES

- A. Scope includes select demolition and new construction.
  - 1. Construction of:
    - a. Fire Station, including truck bays, offices, living quarters.
    - b. Separate meeting room constructed as a Safe Room.
    - c. Select demolition includes parts of existing slab and site work.
  - 2. The entire project will consist of complete site work, structural, mechanical, and electrical systems required for fully operable facilities as described above and as required in all applicable codes
- B. Smoking within the building structure will not be permitted.

1.02 PROTECTION AND/OR REPLACEMENT CONTIGUOUS ITEMS

- A. All contiguous items and other items which are disturbed, broken, removed or otherwise damaged during the execution of this Contract shall be replaced with materials, methods, and design of the original construction.

1.03 CONTRACTOR USES OF PREMISES

- A. Confine operations at site to areas permitted by Law, Ordinances, and Permits and Contract Documents.
- B. Do not unreasonably encumber site with materials or equipment. Store materials and equipment in areas designated.
- C. Do not load structure with weight that will endanger structure.
- D. Assume full responsibility for protection and safe keeping of products stored on premises.
- E. Move any stored products which interfere with construction operations.
- F. Coordinate activities and use of roads, staging areas, etc., with Owner and Architect or Engineer.
- G. Obtain and pay for use of additional storage or work area for needed operations.

1.04 LOCATING AND PROTECTION OF EXISTING UTILITIES

- A. Make a personal inspection of all existing records showing locations of buried and underground utilities. Conduct a walking examination to physically verify locations of existing utilities and any conflicts with the proposed construction and the location of existing utilities.
  - 1. Prior to performing any excavation and /or trenching operations, notify Arkansas 811 ([arkansas811.com](http://arkansas811.com)) to schedule location of existing utilities and services.

1.05 GRADES, LINES, LEVELS, AND SURVEYS

- A. All grades, lines, levels, and benchmarks for the building shall be established and maintained by the General Contractor who shall be responsible for same.
- B. Verify all grades, lines, levels, and dimensions as shown on the Drawings, and report any errors or inconsistencies discovered in the above to the Architect before commencing work. Provide and maintain established benchmarks in not less than two widely separated places.

#### 1.06 FIELD MEASUREMENTS

- A. The General Contractor shall take measurements in the field to verify or supplement dimensions indicated on Drawings and shall be responsible for accurate fit of specified work. Any discrepancy between the Drawings and the actual conditions shall be reported immediately to the Architect.
- B. Tolerances: The General Contractor shall be responsible to maintain dimensions for spaces requiring close tolerances for such items as equipment or fixtures by "grounding" such locations. Uneven surfaces and joints will not be accepted which prevent the installation of units whose dimensions are shown in the documents.
- C. The General Contractor shall appoint one of his personnel who is continually employed on the job site (such as the Superintendent) whose additional duty it will be to act as fire warden for the project. The fire warden shall institute and vigorously enforce a program of fire safety for the project.

#### 1.07 ITEMS FURNISHED AND INSTALLED BY THE OWNER

- A. Such items will be unloaded by the Owner at the job site. The Owner will provide temporary storage for all such items. Once such items are inside the building, the Contractor's insurance shall be extended to cover these items. The Owner will schedule and coordinate delivery and installation with the Contractor.
  - 1. Coffee makers for the Kitchen and Coffee Area.

#### 1.08 OWNER FURNISHED, OWNER INSTALLED ITEMS AND EQUIPMENT RESPONSIBILITIES OF EACH PARTY (OFOI)

- A. The Contractor shall cooperate with the Owner regarding delivery, storage and installation, coordination to minimize the inconvenience of each to the other. The Contractor will be required to provide conduit, cables, electrical wiring, outlets, panel boxes, water and gas lines, etc., as required to "hook up" equipment and render it operational. Owner's activities include final "plug-in" type connections only unless otherwise noted.
- B. OFOI items will be unloaded by the Owner at the project site. The Owner will provide temporary storage for the items. Once items are on the project site, Contractor's insurance shall be extended to cover such items.

#### 1.09 ITEMS PROVIDED BY THE OWNER AND INSTALLED BY THE CONTRACTOR (OFCI)

- A. Such items will be unloaded by the Contractor at the job site. The Contractor will provide temporary storage for all such items. Once such items are inside the building, the Contractor's insurance shall be extended to cover these items. The Owner will schedule and coordinate delivery and installation with the Contractor.
  - 1. Turnout Washer
  - 2. Turnout Dryer
  - 3. Gear Lockers
  - 4. Kitchen Wall and Base Cabinets (counter tops are part of the base bid)
- B. Contractor to provide support structure, exhaust duct, fan, and weatherproof termination cap for OFCI items.

#### 1.10 OWNER FURNISHED, CONTRACTOR INSTALLED ITEMS AND EQUIPMENT RESPONSIBILITIES OF EACH PARTY

- A. Owner's Responsibilities
  - 1. Arrange for and deliver necessary shop drawings, product data and samples to the Contractor.
  - 2. Arrange and pay for product delivery to the site.
  - 3. Deliver supplier's bill of materials to Contractor, when required.
  - 4. Inspect deliveries jointly with Contractor.
  - 5. Submit claims for transportation damage.
  - 6. Arrange for replacement of damaged, defective, or missing items.
  - 7. Arrange for manufacturer's warranties, bonds, service, inspections, as required.



B. Contractor's Responsibilities

1. Designate delivery date for each Product in the Construction Schedule.
2. Review shop drawings, product data and samples. Return such submittals to the Architect.
  - a. Submit to Architect notification of any discrepancies or problems anticipated in the use of the product.
3. Handle products at the site, including unloading, uncrating, storage and protection of the delivered items from damage. Contractor agrees to assume full responsibility for and insure all such items upon delivery.
4. Assemble, install, connect, adjust and finish products, as stipulated in the respective Section of the Specifications.
5. Repair or replace items damaged by Contractor or because of Contractor neglect.

END OF SECTION



SECTION 01020

ALLOWANCES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes furnishing materials and installation of materials as defined herein under "Cost Allowances".
- B. Related Work: The following items of related work are specified in other Sections.
  - 1. The Section of the Specifications listed under the respective Allowances.

1.02 ALLOWANCES FOR PRODUCTS

- A. All allowances for products shall be in the amounts stated under the respective allowances.
- B. Purchase such products under each allowance as directed by the Architect.
- C. The amount of each allowance shall include the following:
  - 1. Net cost of the product.
  - 2. Delivery and unloading at the site.
  - 3. All applicable taxes.
  - 4. Labor, installation and finishing as required by the allowance, unless otherwise specified.
  - 5. Handling at the project site, including uncrating and storage.
  - 6. Protection at the project site from elements, damage, and theft.
  - 7. Other expenses required to complete the installation, such as any necessary testing, adjusting, and balancing.
  - 8. Contractor's overhead and profit.

1.03 SELECTION OF PRODUCTS UNDER ALLOWANCES

- A. The Architect will furnish to the Contractor all necessary drawings, finishes, colors, etc.
- B. Obtain the required proposals in writing from the suppliers.
- C. Notify the Architect of any adverse effects anticipated by the selections of a particular product or supplier, such as: Construction Schedule and Contract Sum.
- D. Furnish completion dates for services under each allowance.
- E. Once the product has been approved in writing by the Architect, the Contractor shall enter into a purchase agreement with the supplier.

1.04 VERIFICATION AND ADJUSTMENT OF COSTS

- A. Verify, by invoices or other data, all expenditures of monies for services purchased under each allowance.
- B. Do not exceed any allowance without first obtaining written approval from the Architect and Owner.
- C. Should the actual cost of any service covered under any allowance be more or less than the specified amount of the allowance, the Contract sum will be adjusted by a change order equal to the amount of the difference. Such change order shall include a percentage to cover the Contractor's additional overhead and profit in such amounts as outlined in the General Conditions of the Contract for Construction.

PART 2 - COST ALLOWANCES

2.01 LIST OF ALLOWANCES

- A. Allowance for Brick Masonry: Refer to Section 04210 for additional requirements.
  - 1. Allow the sum of Five Hundred Fifty Dollars (\$550.00) per 1,000 bricks for the brick masonry delivered to the job site and stacked in an area as directed. Erection of the brick masonry, mortar and masonry accessories and reinforcement are not to be considered to be a part of this Allowance.
  
- B. Allowances for Tile: Refer to Section 09300 for additional requirements.
  - 1. Allowance is for tile materials only; installation shall be under the Base Bid and is not to be considered to be a part of this Allowance.
  - 2. Floor and Wall Tile: Allow the sum of Four Dollars and Fifty Cents (\$4.50) per square foot.
  
- C. Allowance for Identifying Devices (Interior Signage): Refer to Section 10400 for additional requirements.
  - 1. Interior Signage and Identifying Devices: Allow the sum of Six Thousand Five Hundred Dollars (\$6,500.00) for the materials and installation of all interior signage and identifying devices. This includes one wall plaque for project information.
  
- D. Allowance for Finish Hardware: Includes the purchase and delivery of all finish hardware items to the job site. The installation of such finish hardware items shall be under the Base Bid and is not to be considered to be a part of this Allowance.
  - 1. Allow the sum of Five Hundred and Fifty Dollars (\$550.00) for each typical door leaf hardware without exit device.
  - 2. Allow the sum of One Thousand Five Hundred Dollars (\$1,500.00) for each door leaf hardware with exit device.
  
- E. Allowance for Appliances: Refer to section 11451 – Appliances, and the drawings for additional requirements.
  - 1. Allow the sum of Eleven Thousand Dollars (\$11,000.00) for appliances: Dishwasher, range/oven, microwave, refrigerator, clothes washer, and clothes dryer.
  - 2. Allowance includes equipment, taxes, deliver and unloading at job site.

END OF SECTION

SECTION 01030

ALTERNATES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes lump sum price for each alternate specified.
- B. The Owner shall have the right to accept the Alternates in the following order to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted: 1, 2, 3, 4.

1.02 RELATED REQUIREMENTS

- A. Project Requirements
- B. Submittals
- C. Materials and Equipment
- D. Temporary Construction Facilities
- E. Contract Closeout

1.03 RELATED WORK

- A. Referenced Sections of the Project Manual stipulate pertinent requirements for products and methods to achieve the work stipulated under each Alternate.

1.04 REQUIREMENTS

- A. A lump sum price for each Alternate shall be submitted on the Bid Proposal Form. This amount shall be added to or deducted from the Base Bid if the Owner desires to accept the Alternates.
- B. Coordinate pertinent related work and modify surrounding work as required to properly integrate the work under each Alternate, and to provide the complete construction required by the Contract Documents.
- C. The Owner will have the prerogative to add any or all of the deducted work back into the Construction Contract within 90 days of the execution of the Agreement, provided the addition of deducted work back into the Construction Contract does not affect previously completed construction. If work under an Alternate is added back into the Construction Contract, the cost for each added item shall not exceed the cost added to the Base Bid for that item.
- D. All guarantees and bonds required in connection with the Alternates shall in every way conform to those required for the Base Bid items replaced by or supplemented by the Alternate. The amount stated in each Alternate proposal shall include the cost of all changes necessitated by acceptance of that alternate whether specifically mentioned or not. Work performed as a result of the Owner's acceptance of an Alternate proposal shall conform in every way to all sections of the specifications.

1.05 DEDUCTIVE ALTERNATES

- A. Deductive Alternate No. 1: State the amount to be deducted from the Base Bid for omitting the Safe Room and all associated building work. Site preparation, grading, and drainage shall be part of the base bid and remain in the contract.
- B. Deductive Alternate No. 2: State the amount to be deducted from the Base Bid for omitting the cleaning of the asphalt parking area and omitting the installation of the asphalt seal coat on the asphalt parking area.
- C. Deductive Alternate No. 3: State the amount to be deducted from the Base Bid for omitting Folding Door Type G and steel jamb columns, and installing fully glazed overhead doors and operators similar to Door Type F.
- D. Deductive Alternate No. 4: State the amount to be deducted from the Base Bid to install metal wall panels in lieu of brick veneer on the South side of the Truck Bays.

END OF SECTION

SECTION 01040  
COORDINATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes Contractor coordination of the portion of his work with that of his subcontractors, including all mechanical and electrical work.

1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work
- B. Section 01020 - Allowances
- C. Section 01030 - Alternates
- D. Section 01045 - Cutting and Patching
- E. Section 01050 - Field Engineering
- F. Section 01200 - Project Meetings
- G. Section 01340 - Submittals
- H. Section 01500 - Temporary Construction Facilities
- I. Section 01600 - Materials and Equipment
- J. Section 01700 - Contract Closeout
- K. Section 01720 - Record Documents

1.03 CONTRACTOR'S DUTIES

- A. Work with trades specified in Divisions 2 through 16.
- B. Coordinate the schedules of all trades, including mechanical and electrical subcontractors.
  - 1. Verify timely deliveries of products for installation by all trades.
  - 2. Verify that labor and materials are adequate to maintain schedules.
- C. Conduct conferences among all subcontractors and other concerned parties, as necessary to:
  - 1. Maintain coordination and schedules.
  - 2. Resolve matters in dispute.
- D. Participate in project meetings:
  - 1. Report progress of each trade.
  - 2. Recommend needed changes in schedules.
  - 3. Transmit minutes of meetings to trades as appropriate.

- E. Temporary Utilities
  - 1. Coordinate installation, operation and maintenance, to verify compliance with project requirements and with Contract Documents.
  - 2. Verify adequacy of service at required locations.
  
- F. Shop Drawings, Product Data and Samples - Submittals
  - 1. Prior to submittal, review for compliance with Contract Documents.
    - a. Check field dimensions, clearance dimensions and finish requirements.
    - b. Check relation to available space.
    - c. Check anchor bolt settings and setting of other embedded items.
    - d. Review the effect of any changes on the work of other contracts or trades.
    - e. Check items to receive field finish. Verify that item is suitable to receive such finish.
    - f. Check compatibility with mechanical and electrical equipment and work of other trades.
    - g. Coordinate controls and interlocks:
      - (1) Voltages
      - (2) Wiring of pneumatic switches or relays.
      - (3) Coordinate wiring and control diagrams.
  
- G. Coordination Drawings
  - 1. Prepare, as required to assure coordination of work of, or affected by trades or to resolve conflicts.
  - 2. Contractor to review prior to transmitting to appropriate trades.
  - 3. Reproduce and distribute Contractor approved copies to all concerned parties.
  
- H. Observe required testing; maintain a record of tests:
  - 1. Testing agency and name of inspector.
  - 2. Subcontractor.
  - 3. Manufacturer's Representative present.
  - 4. Date and time of testing.
  - 5. Type of product or equipment.
  - 6. Type of test and results.
  - 7. Retesting required.
  
- I. Verify that subcontractors maintain accurate record of documents.
  
- J. Document all window and door openings and through wall flashing.
  - 1. Notify related subcontractors that openings will be photo documented prior to brick or finish material being installed.
  - 2. Photo document and verify all flashing and weather barrier has been installed properly. Correct any deficiencies.
  - 3. Maintain record for file and future reference as needed.
  
- K. Substitution and Changes
  - 1. Review proposals and requests:
    - a. Check for compliance with Contract Documents.
    - b. Verify with work and equipment of other trades.
  - 2. Recommend action to concerned parties.
  
- L. Observe work of all trades, including mechanical and electrical work for compliance with requirements of Contract Documents.
  - 1. Maintain list of observed deficiencies.
  - 2. Promptly report deficiencies or discrepancies to applicable parties.
  
- M. Assemble documentation for handling of claims or disputes involving various trades.



- N. Equipment Startup
  - 1. Check to assure that utilities and specified connections are complete and that equipment is in operable condition.
  - 2. Observe test, adjust and balance.
  - 3. Record results, including time and date of startup.
- O. Inspection and Acceptance of Equipment
  - 1. Prior to inspection, check that equipment is clean, repainted as required, tested, and operational.
  - 2. Assist inspector; prepare list of items to be completed or corrected.
  - 3. Should acceptance and operation of equipment constitute the beginning of the specified guarantee period, prepare and transmit written notice to Owner.
- P. Assemble Record Documents for subcontractors; transmit to Architect for delivery to Owner.

#### 1.04 COORDINATION SCHEDULE

- A. The schedule designates areas of basic responsibility of contractors and subcontractors, including items of mechanical work for electrical power and control wiring for the project, but does not define scope.
- B. Refer to respective Sections of Project Manual for detailed descriptions of work required.
- C. Contractor Shall:
  - 1. Maintain Schedule throughout construction period; record changes in responsibilities due to:
    - a. Modifications to Contract.
    - b. Field orders.
    - c. Substitutions.
  - 2. Reproduce and distribute revised schedule promptly after each change to affected subcontractors, material suppliers, Architect, and Owner.

END OF SECTION



SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Contractor shall be responsible for all cutting, fitting and patching, including attendant excavation and backfill, required to complete the Work or to:
  - 1. Make its several parts fit together properly.
  - 2. Uncover portions of the Work to provide for installation of ill-timed work.
  - 3. Remove and replace defective work.
  - 4. Remove and replace work not conforming to requirements of Contract Documents.
  - 5. Remove samples of installed work as specified for testing.
  - 6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.
  - 7. Removal of portions of existing slab as necessary to execute proposed work.
- B. Related Requirements in Other Parts of the Project Manual:
  - 1. Basic responsibilities of parties: Conditions of the Contract.

1.02 SUBMITTALS

- A. Submit a written request to the Architect well in advance of executing any cutting or alteration which affects:
  - 1. The work of the Owner or any separate contractor.
  - 2. The structural value or integrity of any element of the Project.
  - 3. The integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
  - 4. The efficiency, operational life, maintenance or safety of operational elements.
  - 5. The visual qualities of sight-exposed elements.
- B. The request shall include:
  - 1. Identification of the Project.
  - 2. Description of the affected work.
  - 3. The necessity for cutting, alteration or excavation.
  - 4. The effect on the work of the Owner or any separate contractor, or on the structural or weatherproof integrity of the Project.
  - 5. Description of the proposed work:
    - a. The scope of cutting, patching, alteration, or excavation.
    - b. The trades who will execute the work.
    - c. Products proposed to be used.
    - d. The extent of refinishing to be done.
  - 6. Alternatives to cutting and patching.
  - 7. Cost proposal, if applicable.
  - 8. Written permission of any separate contractor whose work will be affected.
- C. Should conditions of the work or the schedule indicate a change of products from the original installation, Contractor shall submit a request for substitution as specified in Sections 01340 and 01600.
- D. Submit a written notice to the Architect designating the date and the time the work will be uncovered.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Comply with specifications and standards for each specific product involved.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Inspect existing conditions of the Project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, inspect the conditions affecting the installation of products, or performance of the work.
- C. Report unsatisfactory or questionable conditions to the Architect in writing; do not proceed with the work until the Architect has provided further instructions.

### 3.02 PREPARATION

- A. Provide adequate temporary support as necessary to assure the structural value or integrity of the affected portion of the Work.
- B. Provide devices and methods to protect other portions of the Project from damage.
- C. Provide protection from the elements for that portion of the Project which may be exposed by cutting and patching work, and maintain excavations free from water.

### 3.03 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.
- B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- C. Employ the original Installer or Fabricator to perform cutting and patching for weather-exposed or moisture-resistant elements and sight-exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances and finishes.
- E. Restore work which has been cut or removed; install new products to provide completed Work in accord with requirements of Contract Documents.
- F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces. Fire caulk where required to maintain integrity of fire rating.
- G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes.

END OF SECTION

SECTION 01050  
FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Provide and pay for field engineering services required for this Project. Such field engineering shall include:
  - 1. Survey work required in the execution of the Project.
  - 2. Other engineering services which the Contractor may select to contract at his option.
- B. Existing control points, property line corners and construction limits are as indicated on the Drawings.

1.02 RELATED SECTIONS

- A. Section 01010 - Summary of Work
- B. Section 01700 - Contract Closeout
- C. Section 01720 - Record Documents

1.03 QUALITY ASSURANCE

- A. Qualifications of Surveyor and Engineer: Provide a registered engineer/surveyor approved by the Architect and Owner. Engineer shall be registered in the discipline required for the specific service to be performed, licensed in the State where the project is constructed.

1.04 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the Project are those designated on the Drawings.
- B. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.
  - 1. Make no changes or relocations without prior written approval from the Architect.
  - 2. Report to the Architect when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.
  - 3. Require surveyor to replace project control points which may be lost or destroyed.
    - a. Establish replacements based on original survey control.

1.05 PROJECT SURVEY AND CONSTRUCTION ENGINEERING REQUIREMENTS

- A. Establish a minimum of two (2) permanent benchmarks on the site, referenced to data established by survey control points.
  - 1. Record locations, with horizontal and vertical data, on Project record Documents.
- B. Establish lines and levels, locate and lay out, by instrumentation and similar appropriate means:
  - 1. Existing column lines.
  - 2. Building floor slab elevations, column locations, roof elevations and variations in levels.
  - 3. Controlling lines and levels required for the mechanical and electrical trades.
- C. From time to time, verify layouts by the same methods.

1.06 RECORDS

- A. Maintain complete, accurate log of all control and survey work as it progresses.
- B. On completion of the steel framing, prepare a certified survey showing all dimensions, locations, angles, and elevations of construction.
  - 1. Notify Architect of any discrepancies or deviations; submit survey showing any discrepancies or deviations to the Architect and Structural Engineer.
  - 2. Submit with closeout package in accordance with Sections 01700 and 01720.

1.07 SUBMITTALS

- A. On request of the Architect, submit documentation to verify accuracy of field engineering work.
- B. Submit certificate signed by registered engineer or surveyor (as applicable) certifying that elevations and locations of improvements are in conformance, or non-conformance with Contract Documents.

END OF SECTION

SECTION 01150

UNIT PRICES

PART I - GENERAL

1.01 SECTION INCLUDES

- A. Includes requirements for administrative and procedural requirements for unit prices.
- B. A unit price is an amount proposed by Bidders and stated on this Unit Price Schedule and attached to the Bid Proposal Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event the estimated quantities of Work required by the Contract Documents are increased or decreased.
- C. Unit prices shall include all necessary material, labor, overhead, profit and applicable taxes.
- D. Refer to individual Specification Sections for construction activities requiring the establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- E. Schedule: A "Unit Price Schedule" is included at the end of this Section. Specification Sections referenced in the Schedule contain requirements for materials and methods described under each unit price.
- F. The Owner reserves the right to reject the Contractor's measurement of work-in-place that involves use of established unit prices, and to have this Work measured by an independent surveyor acceptable to the Contractor at the Owner's expense.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.01 UNIT PRICE SCHEDULE

- A. Earthwork: Undercut unsuitable soils, remove from Project Site, and replace with borrowed engineered fill material: \$ \_\_\_\_\_/CY.
- B. Electrical: Provide price to add/install one duplex electrical outlet: \$ \_\_\_\_\_ per outlet.
- C. Attach a copy of this Unit Cost Section to the Bid Form.

END OF SECTION





SECTION 01200  
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The Contractor shall schedule and administer a preconstruction meeting, twice monthly progress meetings and specially called meetings throughout the progress of the Work. The Contractor shall conduct the progress meetings, and:
  - 1. Prepare agenda for meetings.
  - 2. Make physical arrangements for meetings.
  - 3. Record the minutes; include all significant proceedings and decisions.
  - 4. Reproduce and distribute copies of minutes within three days after each meeting.
    - a. To all participants in the meeting.
    - b. To all parties affected by decisions made at the meeting.
    - c. Furnish copies of minutes to the Architect.
- B. Representatives of Contractors, Subcontractors and suppliers attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. The Architect or Engineers will attend meetings as necessary (at least monthly) to ascertain that work is expedited consistent with Contract Documents and the construction schedules.

1.02 PRE-CONSTRUCTION MEETING

- A. A Pre-Construction meeting shall be scheduled at the project site within 5 days after date of Notice to Proceed. This meeting shall be attended by:
  - 1. Owner's Representative.
  - 2. The Architect or his representative.
  - 3. Contractor's Superintendent.
  - 4. Major Subcontractors.
  - 5. Others as Appropriate.
- B. The following is a suggested Agenda for this meeting:
  - 1. Review requirements of Divisions 0 and 1 of the Project Manual.
  - 2. Projected Construction Schedules.
  - 3. Critical work sequencing.
  - 4. Major priorities.
  - 5. Project Coordination.
  - 6. Procedures and processing of:
    - a. Field Decisions.
    - b. Submittals.
    - c. Payroll Submittals.
    - d. Change Orders and itemization of cost.
    - e. Applications for payment.
  - 7. Extension of time (weather data shall be based on U. S. Weather Bureau statistics).
  - 8. Adequacy of distribution of Contract Documents.
  - 9. Use of premises.
  - 10. Construction facilities, controls and construction aids.
  - 11. Temporary Utilities.
  - 12. Safety and first-aid procedures.

13. Security procedures.
14. Housekeeping procedures.

### 1.03 PROGRESS MEETINGS

- A. Progress Meetings shall be scheduled at the Project Site monthly, concurrent with the Contractor submitting each Application for Payment. The meetings will be attended by:
  1. The Contractor's Superintendent and Project Manager.
  2. Subcontractors as appropriate to the stage of construction.
  3. The Architect, Engineer, or his representative.
  4. The Owner's representative (when required).
  5. Others, as required.
- B. The Contractor may schedule meetings with the subcontractors as frequently as necessary.
- C. The following is a suggested agenda for this meeting:
  1. Review of work progress since previous meeting.
  2. Application for Payment.
  3. Field observations, problems, conflicts.
  4. Problems which impede construction schedule.
  5. Review of off-site fabrication, delivery schedules.
  6. Corrective measures and procedures to regain projected schedule.
  7. Revisions to construction schedule.
  8. Plan progress, schedule, during succeeding work period.
  9. Coordination of schedules.
  10. Review submittal schedules: Expedite as required.
  11. Maintenance of quality standards.
  12. Other business, as required.

### 1.04 QUALITY ASSURANCE

- A. Preliminary Installation and Pre-Installation conferences shall be held on-site for the following materials and systems:
  1. Brick Masonry
  2. Fiber Cement Board
  3. Metal Wall Panels
  4. Weather Barrier and Flashings
  5. Exterior doors and windows
  6. Roofing, including insulated nail deck, rigid insulation, underlayment, membrane, and metal roofing.
  7. Additional materials and systems as required in other sections.
- B. Mock-up Panel: Construct a mock-up panel as directed, in order to illustrate the various exterior finish materials. Refer to Section 01451.
- C. Preliminary Installation Conference: As soon as possible, meet with the material installer, installer of substrate construction, and other work associated and adjoining work, including structural systems; the Architect; and representatives of other entities directly concerned with performance of the materials or system.
  1. Review requirements of the Contract Documents, submittals, status of coordinating work and availability of materials and installation facilities; establish preliminary installation schedule. Review requirements for inspections, testing, certifications, forecasted weather conditions, governing regulations and proposed installation procedures.
  2. Record discussion, including agreement or disagreement on matters of significance; furnish copy of recorded discussions to each participant.
  3. Discuss material or system protection requirements for construction period extending beyond material or system installation.

4. If meeting ends with substantial disagreements, determine how disagreements will be resolved and set date for reconvened meeting.
- D. Pre-Installation Conference: Approximately 2 weeks before scheduled commencement of material installation and associated and adjoining work, meet at project site with installer; installer of each component of associated and adjoining work; the Architect; material manufacturer's representative; and other representatives directly concerned with performance of the work.
1. Record in writing discussions, decisions, and agreements (or disagreements) reached at conference; furnish copy of report to each entity attending.
  2. Review foreseeable methods and procedures related to the work.
  3. Tour representative areas of substrates; inspect and discuss condition of substrate and other preparatory work performed by other trades.
  4. Review material and system requirements (drawings, specifications, and other Contract Documents). Ensure installation method and techniques are in full compliance with manufacturer's requirements and that all warranties will apply.
  5. Review required submittals, both completed and yet to be completed.
  6. Review and finalize construction schedule related to the work; verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  7. Review weather and forecasted weather conditions, as well as procedures for coping with favorable conditions.

END OF SECTION



## SECTION 01340

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes submittals to the Architect of shop drawings, product data, samples, and other submittals required by the Contract Documents. Items, materials and equipment proposed for use on this project, as specified/scheduled, will require submittals as evidence of item, product, material, equipment being furnished.

##### 1.02 TYPES OF SUBMITTALS

###### A. Shop Drawings

1. Shop drawings include technical data prepared specifically for this project including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements, and similar information not in standard printed form which illustrates a portion of the work.
2. Drawings shall be presented on bond in a clear and complete manner in appropriate size and scale with details identified by reference to sheet and detail, schedule, or room numbers shown on Contract drawings with the name of the Preparer indicated (firm name).
3. Digital submittals of shop drawings and product data are acceptable.
4. Shall be prepared by a qualified detailer (see technical Sections).
5. Identify field dimensions; show relation to adjacent or critical features, work, or products.

###### B. Product Data

1. Product data includes standard printed information on materials, products and systems not specifically prepared for this project other than the designation of selections from among available choices printed therein.
2. Preparation
  - a. Clearly mark each copy to identify pertinent products or models.
  - b. Show performance characteristics and capacities.
  - c. Show dimensions and clearances required.
  - d. Show wiring or piping diagrams and controls.
3. Manufacturer's standard schematic drawings and diagrams
  - a. Modify drawings and diagrams to delete information which is not applicable to the work.
  - b. Supplement standard information to provide information specifically required and applicable to the work.

###### C. Samples

1. Samples are physical examples which illustrate materials, equipment, or workmanship and establish standards by which the work will be judged.
2. Office samples shall be of sufficient size and quantity to illustrate clearly:
  - a. Functional characteristics of the product with integrally related parts and attachment devices.
  - b. Full range of color, texture, and pattern.
3. Mock-ups are a special form of samples which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals. When required, mock-ups are specified under appropriate specification section.

- D. Miscellaneous submittals related directly to the work (non-administrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports, physical work records, quality testing and certifying measurement data, operating and maintenance materials, overrun stock, and similar information, devices, and materials applicable to the work and not processed as shop drawings, product data, or samples.

### 1.03 CONTRACTOR RESPONSIBILITIES

- A. Review and indicate approval of shop drawings, product data, samples, and miscellaneous submittals with approval stamp and signature prior to submission to Architect.
- B. Determine and/or verify before submitting for approval:
  - 1. Field measurements
  - 2. Field construction criteria
  - 3. Catalog numbers and similar data
  - 4. Conformance with Contract Documents
- C. Coordinate each submittal with requirements of the work. Submittal schedules shall allow not less than fourteen (14) working days for Architect's review.
- D. Notify the Architect in writing, at time of submission, of any deviations in the submittals from requirements of the Contract Documents. The deviations shall be clearly marked on all copies of the submittal.
- E. Begin no fabrication or work which requires submittals until return of submittals with Architect's acceptance.
- F. Maintain a "Shop Drawing, Product Data, and Sample Log" identified with project name and descriptive identification. Log shall show title of each submittal, date of submittal, date returned, or status.

### 1.04 CONTRACTOR SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with progress schedule and in such sequence as to cause no delay in the work or in the work of any other contractor.
- B. Number of Submittals Required
  - 1. Shop drawings: Submit the number of copies which the Contractor requires: One (1) copy will be retained by the Architect, except for structural, mechanical, plumbing, fire protection and electrical items, of which two (2) copies will be retained by the Architect.
  - 2. Digital submittals of shop drawings and product data are acceptable.
  - 3. Product data: Submit the number of copies which the Contractor requires, plus two (2) copies which will be retained by the Architect.
  - 4. Samples: Submit the number stated in each specification or a minimum of two (2) for each sample required.
- C. All Submittals shall contain:
  - 1. The date of submission and the dates of any previous submissions.
  - 2. Project name.
  - 3. Contract identification.
  - 4. The names of:
    - a. Contractor
    - b. Supplier
    - c. Architect
  - 5. Identification of the product with the specification section number.
  - 6. Field dimensions clearly identified as such.
  - 7. Relationship to adjacent or critical features of the work or materials.
  - 8. Applicable standards such as ASTM numbers.
  - 9. Specific identification, in writing, of deviations if any from Contract Documents.
  - 10. Identification of revisions on resubmittals.
  - 11. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents. Those without stamp will not be reviewed by the Architect.

- D. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of shop drawings, product data, or samples unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission, and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the shop drawings, product data, or samples by the Architect's approval thereof. The Architect's approval of a separate item shall not indicate approval of an assembly in which the item functions.
- E. In checking shop drawings, the Architect will not check dimensions, quantities, electrical characteristics, specific capacities, or coordination with the trades. These are the responsibility of the Contractor.

#### 1.05 CONTRACTOR'S RESUBMISSION REQUIREMENTS

- A. Make any corrections or changes in the submittals required by the Architect and resubmit until approved. "Field Copy" of shop drawings without Architect's approval stamp shall not be used at the project site.
- B. Shop Drawings and Product Data
  - 1. Revise initial drawings or data, and resubmit as specified for the initial submittal.
  - 2. Clearly identify any changes which have been made other than those requested by the Architect.
- C. Samples: Submit new samples as required for initial submittal.

#### 1.06 DISTRIBUTION

- A. Distribute, without additional cost to the Owner or Architect, reproductions/copies of product data which carry the Architect's stamp of review and/or approval to:
  - 1. Job site file.
  - 2. Record Documents file.
  - 3. Other affected contractors.
  - 4. Subcontractors as applicable.
  - 5. Supplier or Fabricator as applicable.
- B. Distribute samples which carry the Architect's stamp of approval as directed by the Architect.

#### 1.07 LIMITS OF APPROVAL

- A. Nothing in the approval of shop drawings and samples shall be construed as authorizing additional work or increased cost to the Owner unless a change order has been authorized as provided in Sections 00700 and 00800.

#### 1.08 SUBSTITUTIONS

- A. Substitutions of material or equipment on an "or equal" basis shall not be proposed or requested in shop drawing or sample submittals unless submitted in accordance with Section 01600.

#### 1.09 SHOP DRAWING RECORDS

- A. Submit to the Owner one (1) final record copy of shop drawings marked "FOR JOB USE" which reflects all changes required in previous submittals including those marked "APPROVED AS NOTED" or similarly revised by the Architect or Engineers.

END OF SECTION





## SECTION 01410

### TESTING LABORATORY SERVICES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes Owner employment and payment of the services of an independent testing laboratory approved by the Engineers to perform specified services and testing. Employment of the laboratory does not relieve Contractor's obligations to perform the Work of the Contract.
- B. Contractor shall coordinate all inspections including those required by law, ordinances, rules, regulations, orders, or approvals of public authorities as required by the Contract Documents.
  - 1. Testing agency shall furnish copies of Products Test Reports as required.
  - 2. Contractor shall furnish incidental labor and facilities to facilitate inspections and tests and for storage and curing of test samples.
  - 3. Contractor shall notify the laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.
  - 4. Contractor shall make arrangements with laboratory and pay for additional samples and tests required for Contractor's convenience.

##### 1.02 TESTING LABORATORY

- A. Qualifications
  - 1. Meet "Recommended Requirements for Independent Laboratory Qualification", published by the American Council of Independent Laboratories, and basic requirements of ASTM E 329 "Standards of Recommended Practice for Inspection and Testing Agencies for Concrete and Steel as Used for Construction".
  - 2. Be authorized to operate in the State where the project is constructed.
  - 3. Submit copies of the report of inspection to the Architect with memorandum of remedies of any deficiencies reported by the inspection.
- B. Duties and Limitations of Authority
  - 1. Perform specified inspections, sampling and testing of materials and methods of construction, and promptly submit two (2) copies of the written report to the Architect within one (1) day of the test(s). Immediately email or fax one (1) copy to the Architect. Each report shall include:
    - a. Date issued.
    - b. Project name.
    - c. Testing laboratory name, address, and telephone number.
    - d. Name and signature of Engineer and laboratory Inspector or Technician.
    - e. Date and time of sampling or inspection or test.
    - f. Record of temperature and weather conditions.
    - g. Location in the project of sample or test.
    - h. Results of the test in compliance with Contract Documents.
    - i. Monetary accounting of tests by test type, indicating test or retest charges under this Contract.
  - 2. Laboratory is not authorized to release, revoke, alter or enlarge on requirements of the Contract Documents, approve or accept portions of the Work, or perform duties of the Contractor.

1.03 QUALITY ASSURANCE

- A. The following tests and inspections and the frequency of tests and inspections shall be strictly adhered to.
- B. The following tests and inspections shall be considered the minimum required. See other sections and drawings for additional requirements.
- C. Test soils in each area of the proposed additions.

TYPE OF WORK	ITEM	SAMPLE FREQUENCY	SAMPLE SIZE	MINIMUM TESTING
General Earthwork and Fill	Soil Material	1 per soil type	50 lbs.	- Gradation - P.I. - Moisture-Density - Relationship - Probe all footings to test bearing
	Compaction	1 per 2,500 sq. ft. per lift (min. of 3 per lift)		Field Density Test
Flexible Base	Base Material	1 per type per 1,000 cu. yds.	50 lbs.	- Sieve - P.I. - Moisture-Density
	Compaction	1 per 2,500 sq. ft. per lift (min. of 3 per lift)		Field Density Test
Hot Mix Paving	Job Mix Formula	1 per HMAC Type		Review and Approval
	Cold Aggregate	Weekly	50 lbs.	Sieve, Sand Equivalent and Examination
	Asphalt	Each transport delivery	1 qt.	As required.
	Uncompacted Mix	2 Daily	35 lbs.	Extraction, Density, Stability
	Compacted Mix on Job	1 per 1,000 sq. yds. or 3 daily, whichever is more		Field Density (Nuclear is permitted)
Concrete	Mix Design	1 per concrete class		- Review & approval with confirmatory cylinders - Plant & materials approval, testing if questionable
	Aggregates (coarse & fine)	1 per 500 cu. yd., min. 1 per job	50 lbs.	Sieve, organic, impurities, specific gravity
	Cement	1 per 100 cu. yds. 10 lbs. min. 1 per job		- fineness - chemical compound - see mill reports

TYPE OF WORK	ITEM	SAMPLE FREQUENCY	SAMPLE SIZE	MINIMUM TESTING
Concrete (continued)	Concrete Placement	1 per 50 cu. yds. or each day's pour if less		- slump - air test - 5 compressive cylinder test: test 2 at 7 days, 2 at 28 days, 1 hold
Welded Steel Inspection	All of welds at shop and field			
	Qualifications of Welders	Each		Observe and verify for required positions
	X-ray welds or Ultra-Sonic Testing of Welds			-all bending stress sections -20% of all other welds
Bolted Steel	Pre-installation Testing			Pre-installation bolt tension calibration per Structural specifications
AU Steel Including Reinforcing	Material	Per Lot		See Mill Report
Foundation	Bearing Surface, Reinforcing Steel & Concrete	Each Pour		Qualified inspector

END OF SECTION



SECTION 01451

MOCKUP PANEL REQUIREMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Mockup Panel: Built on-site in order to establish standards for exterior materials, systems, and installation methods for the project.

1.02 SUBMITTALS

- A. Quality Control Submittals
  - 1. Shop Drawing: Detailed, dimensioned plans and elevations showing mockup panel size, and items and materials that will be included.

1.03 DESCRIPTION OF WORK

- A. Integrated Exterior Mockup: Construct a full-size physical assembly on-site. The mockup panel shall be constructed in accordance with the drawings and specifications for each material and system included in the assembly. The mockup panel shall demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation. Construct the mockup panel so as to show the interface between adjacent and adjoining materials; and to demonstrate compliance with specified installation tolerances.
  - 1. Unless otherwise indicated, the approved mockup shall establish the standard by which the Work will be judged.
  - 2. The Mockup shall not be considered to be material Samples.

1.04 QUALITY ASSURANCE

- A. Mockup Shop Drawing: Submit as described under 1.02.A.1 above, and Section 01340.
- B. Pre-Construction Conference: Prior to the construction of the mockup, a conference will be called by the Contractor for the purpose of reviewing the requirements, and intent of mockup. The conference shall be attended by representatives of the Contractor, the Architect, and all subcontractors and vendors whose work will be included in the mockup.

PART 2 - PRODUCTS AND SYSTEMS

2.01 MOCKUP PANEL

- A. The mockup panel shall be constructed using only materials and systems specifically required for the project, and selections made under sample submittals.
  - 1. Refer to Section 04210 for brick and mortar selection.
- B. All products and systems represented in the mockup panel shall be installed as required by the drawings and specifications.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Before installing portions of the Work represented by the mockup panel, build and finish the panel as directed.
  - 1. Build the mockup panel in a location selected by the architect, and of size and profile indicated in the drawings.
  - 2. Notify the architect a minimum of 15 days in advance of dates and times when mockup will be constructed and available to be inspected.
  - 3. Employ supervisory personnel to oversee mockup construction. Employ same workers that will be employed during the construction of Project.
  - 4. Demonstrate the proposed range of aesthetic effects and workmanship.
  - 5. Commence the Work only after the mockup panel has been inspected and accepted in writing by the architect.
  - 6. The mockup will establish the standard of quality of workmanship by which the Work will be judged.
  - 7. Maintain the mockup panel during construction in an undisturbed condition as a standard for judging the completed Work. Failure to maintain the mockup, until directed, may be cause for rejection of the Work.
  - 8. Demolish and remove mockups when directed unless otherwise indicated.

END OF SECTION

## SECTION 01500

### TEMPORARY CONSTRUCTION FACILITIES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes providing all temporary construction and facilities necessary to complete the Work.

##### 1.02 TEMPORARY FIELD OFFICE AND STORAGE SHEDS

- A. Office: Provide and maintain a temporary field office for the Contractor's use and to be used by the representatives of the Owner and Architect. Provide lights, a working restroom (including a lavatory and watercloset), ventilation and air conditioning to permit comfortable use of the office. Provide and pay for telephone service within the office for administrative use. Provide exterior steps and handrail as required for access to the interior.
- B. Material Storage: Provide and maintain adequate protection and security for materials stored on site.
  - 1. Provide suitable and sufficient enclosed and covered spaces, with raised flooring, to protect materials and equipment subject to damage by weather or construction.
  - 2. Provide sheds, as necessary, to suitably store materials and equipment needing limited protection.
- C. Staging Area: Coordinate with the Owner. Once such an area has been defined, confine all storage and construction staging to this designated area.

##### 1.03 SAFETY DEVICES

- A. Provide all temporary works, including barriers, lighting, covered walkways, required to fulfill this Contract, and at all times comply with local and governing codes and laws and furnish protection to workmen, the public and inhabitants of the building and surrounding areas. Submit for Architect's review a Contractor-prepared program/plan for implementation and execution of such protective barriers.
- B. Maintain areas adjacent to the construction site in manner not to hinder or endanger normal traffic flow, or endanger or damage adjacent property.
- C. All streets shall be kept clean and open for pedestrian and vehicular traffic. Warning lights, guards and barricades shall be utilized and maintained as required to ensure these conditions. Should it be necessary to close right-of-way to pedestrian traffic, erect adequate barricades, lights, etc., as necessary. Erect warning signs directing pedestrians to safe, alternate routes.
- D. Provide cribbing and shoring for excavations which might endanger workmen, equipment or adjacent property.
- E. Erect barricades and/or fencing sufficient to prevent injury to persons or damage to property. Construct to prevent entry of unauthorized persons.
- F. Cover trenches and holes when not in use. Erect barriers as required to maintain safe conditions.
- G. Temporary stairs, ladders and ramps shall be provided to safely enable access to all parts of the work by the Architect and the Owner, or any other authorized personnel. All such equipment shall meet all governing and local safety requirements.
- H. Provide temporary lifting and hoisting devices and equipment as required to distribute materials and equipment to various locations.

#### 1.04 AREAS AVAILABLE

- A. Actual areas in which the project is to be constructed are herein defined to exist within all boundary lines as clearly identified and delineated on the Drawings.
- B. Provide temporary construction easement, limits as shown on the Drawings.

#### 1.05 ACCESS

- A. Limit access to the property so as not to block any entrance to or exit from the site at any time.
- B. Coordinate parking area for Contractor's trucks. All damage made to entrances, driveways and yards shall be repaired by the Contractor.
- C. Parking of cars or other vehicles used for personal transportation shall be coordinated by the Contractor.
- D. All traffic routes shall be kept open at all times, free of all operations and storage of materials.

#### 1.06 PROJECT SIGN AND ARCHITECT'S CONSTRUCTION SIGN

- A. Provide a Project Sign as designed by the Architect. Locate on site as directed by Architect. Sign shall be constructed as detailed, printed on two (2) sides with professionally painted lettering and graphics on each side, typically 4' x 8'. The sign shall conform to all applicable sign and zoning ordinances.

#### 1.07 TEMPORARY WATER DURING CONSTRUCTION

- A. All necessary arrangements for providing all water required during the entire construction period shall be provided by the General Contractor. Where the installation of a water meter is required to obtain temporary water, the metered cost for temporary water shall be borne by the General Contractor. Provide drinking water for construction personnel.

#### 1.08 TEMPORARY TOILET FACILITIES

- A. Provide and maintain in use an adequate number of temporary toilets with proper enclosures as necessary for use of workmen and all inspection staff during construction. Locate toilets where directed and approved by the Owner. Keep toilets clean and comply with all local and governing health requirements and sanitary regulations. Toilet facilities shall consist of the prefabricated chemical type. The plumbing fixtures within the newly constructed areas may not be used by construction personnel.

#### 1.09 TEMPORARY ELECTRICITY DURING CONSTRUCTION

- A. All necessary and sufficient temporary electric service and lighting required during the entire construction period shall be provided by the General Contractor. Monthly service charges shall be borne by the General Contractor.
  - 1. Power sources shall be provided at points as required to complete the Work.
  - 2. Power and lighting in corridors, stairways and other dark enclosed areas shall be provided as required for safety and in accordance with OSHA requirements. Provide lighting levels in all areas to allow for acceptable workmanship.
  - 3. Security site lighting shall be provided as required for protection of personnel and materials. Any such security lighting shall be shielded from adjacent Residential property.
- B. Electricity During Partial Occupancy: Should a portion of the building be occupied by the Owner prior to final acceptance, the metered cost of utilities for the occupied portion of the building will be borne by the Owner from time of partial occupancy until final acceptance, only when agreed and authorized in writing by the Architect.



1.10 COLD WEATHER PROTECTION AND TEMPORARY HEAT

- A. Provide all cold weather protection necessary to carry on the work expeditiously during inclement weather and protect all work and materials against injury and from environment harmful to man.

1.11 PUMPING AND DRAINAGE

- A. Keep working and storage areas free from water that could cause damage or that would interfere with work.
- B. Pump or drain water to designated points. Distribute discharge to prevent excessive erosion.

1.12 TEMPORARY FIRE PROTECTION AND FIRE SAFETY

- A. The Contractor is responsible for fire extinguishers and fire protection for all work, equipment, office, sheds, etc., as required by OSHA regulations.
- B. Free access shall be maintained at all times from the street to fire hydrants and to outside connections for standpipes. Fire doors shall be installed and in operation at the earliest possible time.
- C. Where existing exits occur, they shall be fully maintained at all times and shall be kept free from materials, equipment, or other obstructions.
- D. Combustible materials shall not be stored in the building.
- E. The use of wood scaffolding shall be kept to a minimum and entirely eliminated when possible in order to eliminate fire hazards from this source. No part of the building where forms are in place shall be used for the storage of flammable materials of any kind. Temporary structures of combustible material shall be located not less than 30 feet from the building.
- F. No smoking or use of tobacco in any form shall be permitted within the building or on the roof surfaces.

1.13 HAZARDOUS MATERIALS

- A. The Contractor shall comply with all laws concerning hazardous materials. Hazardous material shall be disposed in a legal manner. MSDS sheets for hazardous materials shall be filed at the Contractor's job site office and as otherwise required by law.

END OF SECTION



## SECTION 01600

### MATERIALS AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes proper methods of shipping materials and equipment, handling, and storage of same in accordance with manufacturer's recommendations. Also includes requirements for making material and equipment substitutions.

##### 1.02 REQUIREMENTS INCLUDED

- A. Conform to applicable specifications and standards.
- B. Comply with size, make, type and quality specified, or as specifically approved in writing by Architect.
- C. Manufactured and Fabricated Products:
  - 1. Design, fabricate and assemble in accord with the best engineering and shop practices.
  - 2. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.
  - 3. Two (2) or more items of the same kind shall be by the same manufacturer and identical.
  - 4. Products shall be suitable for service conditions.
  - 5. Equipment capacities, sizes and dimensions shown or specified shall be adhered to unless variations are specifically approved in writing by the Architect.
- D. Do not use material or equipment for any purpose other than that for which it is designed or specified.

##### 1.03 MANUFACTURER'S INSTRUCTIONS

- A. When Contract Documents require that installation of work shall comply with manufacturer's printed instructions, obtain and distribute copies of such instructions to parties involved in installation, including copies to Architect and Contractor. Maintain one (1) set of complete instructions at the job site during installation and until completion.
- B. Handle, install, connect, clean, condition and adjust products in strict accord with such instructions and in conformance with specified requirements.
- C. Should job conditions or specified requirements conflict with manufacturer's instructions, consult with Architect for further instructions. Do not proceed with work without clear instructions.
- D. Do not omit any preparatory step or installation procedure unless specifically modified or exempted by Contract Documents, or Architect's written instructions.

##### 1.04 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of Products in accordance with construction schedules, coordinate to avoid conflict with work and conditions at the site.
- B. Deliver products in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
- C. Immediately on delivery, inspect shipments to assure compliance with Contract Documents and approved submittals, and that Products are properly protected and undamaged.

- D. Provide equipment and personnel to handle Products by methods to prevent soiling or damage to Products or packaging.

#### 1.05 STORAGE

- A. Store Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store products subject to damage by the elements in weathertight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- B. Exterior Storage
  - 1. Store fabricated products above ground, on blocking or skids; prevent soiling or staining. Cover products which are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.
  - 2. Store loose, granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter.
- C. Arrange storage in a manner to provide easy access for inspection. Make periodic inspections of stored Products to assure that products are maintained under specific conditions, and free from damage or deterioration.
- D. Provide substantial coverings as required to protect installed Products from damage from traffic and subsequent construction operations. Remove when no longer needed.

#### 1.06 SUBSTITUTIONS AND PRODUCT OPTIONS

- A. Submit to the Architect a complete list of major products proposed to be used, with the name of the manufacturer and the installing subcontractor.
- B. Contractor's Options
  - 1. For Products specified only by reference standard, select any product meeting that standard.
  - 2. For Products specified by naming several products or manufacturers, select any one of the products or manufacturers names, which complies with the Specifications.
  - 3. For Products specified by naming one (1) or more Products or manufacturers, Contractor must submit a request for substitutions for any Product of manufacturer not specifically named. Submit data that the substituted product/material will perform as well as the specified item. Substitutions submitted without such substantiating data will be returned without review.
- C. Substitutions
  - 1. For a period of fifteen (15) days after Contract Date, the Architect will consider written requests for substitution of Products. Comply with requirements Paragraph 1.06B 3.
  - 2. Submit a separate request for each Product, supported with complete product data, with Drawings and samples as appropriate, in accordance with Section 01340.
- D. By making requests for substitutions, Contractor:
  - 1. Represents that he has personally investigated the proposed substitute product and determined it is equal or superior in all respects to that specified;
  - 2. Represents that he will provide the same warranty for the substitute that he would for that specified;
  - 3. Certifies that the cost data presented is complete and includes all related costs, and excludes the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently becomes apparent; and
  - 4. Will coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

- E. The Architect will reply in writing to the Contractor stating whether the Architect, after due investigation, has reasonable objection to any such proposal. If adequate data on any proposed manufacturer or installer is not available, the Architect may state that action will be deferred until the Contractor provides further data. Failure to object to a manufacturer shall not constitute a waiver of any of the requirements of the Contract Documents. All products furnished by the listed manufacturer must conform to such requirements.
- F. When a material, equipment or system is approved by the Architect for substitution, such material, equipment or system shall become an essential element of the Contract. The Architect will be the final judge of the acceptability of the substitution. The Architect is under no obligation to consider or accept any proposed substitution, and he may reject any requested substitution for any cause or no cause. No substitution shall be made without authority in writing from the Architect.

#### 1.07 NO-ASBESTOS/NO LEAD REQUIREMENTS

- A. No asbestos-containing or lead-containing materials or products shall be incorporated into the project. All products and materials shall be 100% asbestos free and 100% lead free.
- B. The intent of the Contract Documents is to exclude all materials and products which contain asbestos or lead in any form or amount. In studying the Contract Documents and at any time during execution of the Work, the Contractor shall at once report to the Architect any asbestos-containing materials or products that he may discover. Do not proceed with installation of asbestos-containing materials or products or lead-containing materials or products.
- C. Where products are specified by reference standard or in a descriptive manner without manufacturer's name, model number or trade name, Contractor shall select materials or products meeting specified requirements which do not contain asbestos or lead in any form or amount.
- D. In making requests for substitutions, Contractor shall be responsible for determining that materials and products requested for substitution are 100% free of asbestos and lead in any form.

END OF SECTION



## SECTION 01650

### STARTING OF SYSTEMS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes all material and labor to clean, inspect and adjust in accordance with manufacturer's written recommendations every piece of equipment, control/safety device and system.
- B. Testing, adjusting, and balancing of HVAC systems, although specified elsewhere, is part of this section.
- C. Code required disinfecting of potable water systems, although specified elsewhere, is a requirement of this section.
- D. After completion of all requirements of A, B, and C above, the Contractor shall start up (put into operation) every piece of equipment, control/safety device and system and demonstrate to the Architect and Owner's Representative that same will operate safely, noiselessly, as per code, as specified and as required by Architect whichever is the more stringent requirement.
- E. Related Requirements: 01700 - Contract Closeout.

##### 1.02 RELATED WORK SPECIFIED/INDICATED ELSEWHERE

- A. Equipment, control/safety devices and systems, including, but not limited to, the following:
  - 1. Mechanical
  - 2. Plumbing
  - 3. Fire Protection System
  - 4. Electrical / Fire Alarm

##### 1.03 PROCEDURES

- A. Mechanical and Electrical: Contractor shall provide a detailed checklist and procedures for cleaning, inspecting and adjusting each piece of equipment, control/safety devices, system, etc. All to be in accord with the manufacturer's specific recommendations and as required to prepare each item for proper operation, including, but not limited to, the following items and systems:
  - 1. HVAC Systems
    - a. Exhaust (air)
    - b. Make up air
    - c. Combustion air
    - d. Air handling H/C
    - e. Control
  - 2. Mechanical Equipment, Control/Safety Devices
    - a. Air Handling Units
    - b. Fans and blowers
    - c. Fan coil units
    - d. Coils
    - e. Valves - gate, globe, plug, balancing, etc.
    - f. Filters
    - g. Safety and pressure reducing valves
    - h. Gauges and thermometers

- i. Thermostats and controls
    - j. Sound and vibration attenuation
    - k. Dampers and operators
  - 3. Plumbing Systems
    - a. Domestic cold water
    - b. Domestic hot water
    - c. Sanitary sewer
    - d. Storm sewer
  - 4. Plumbing equipment, controls/safety devices
    - a. Water heaters
    - b. Storage tanks
    - c. Valves - gate, globe, plug, balancing, etc.
    - d. Safety & pressure reducing valves
    - e. Gauges and thermometers
    - f. Thermostats and controls
    - g. Sound & vibration attenuation
    - h. Circulating pumps
    - i. House pumps
    - j. Meters (water and gas)
    - k. Vacuum breakers
    - l. Backflow preventers
    - m. Fixtures and trim
    - n. Automatic fire sprinkler system
  - 5. Electrical Systems
    - a. Emergency lighting
    - b. Grounding
    - c. Power Distribution
    - d. Lighting circuitry
    - e. Equipment - power & control
    - f. Smoke detection
    - g. Light dimming
    - h. Exit lighting
  - 6. Electrical equipment, controls/safety devices
    - a. Motor control center
    - b. Panels - light, power, control, annunciation
    - c. Transformers
    - d. Disconnects
    - e. Breakers
    - f. Fuses
    - g. Switches
    - h. Fixtures & Lamps
    - i. Starters
    - j. Clocks/timers
    - k. Relays
    - l. Solenoids
    - m. Arrestors - surge
    - n. Thermostats
- B. Start-up and check-out of miscellaneous equipment.
1. Equipment manufacturer's representative to visit site, when notified by Contractor that specific equipment is ready for start-up and check-out.
  2. Architect, Owner's Representative, equipment manufacturer's representative, representatives of Contractor and Subcontractor responsible for hook-up, equipment design engineer, and representative of operations staff are to be present during start-up and must sign acceptance of each piece of equipment after check-out.



3. Any deficiencies found must be reported in writing to the Architect and corrected before final check-out and acceptance, again following the above procedure.
4. To minimize site visits, it is preferable to have as many pieces of equipment as possible ready together, with the required representatives available.

## PART 2 - PRODUCTS

### 2.01 CLEANING MATERIAL SHALL BE

- A. Specifically recommended by manufacturer for the service intended.
- B. Approved by the manufacturers of the equipment, item and system being cleaned.
- C. Approved by governing agencies.
- D. Approved by Architect.

### 2.02 DISINFECTING AGENTS

- A. For potable water system shall be:
  1. Specifically recommended by manufacturer for the service intended.
  2. Approved by the manufacturers of the equipment, item and system to be disinfected.
  3. Approved by governing agencies.
  4. Approved by Owner and Architect.

### 2.03 LUBRICANTS AND OTHER MATERIALS

- A. Lubricants and other materials necessary during checking, adjusting or servicing of each piece of equipment, control/safety device on system in preparation for putting it into operation shall be:
  1. Specifically recommended by manufacturer for the service intended.
  2. Approved by the manufacturer of the equipment, item or system part being checked, adjusted or serviced.
  3. Approved by governing agencies.
  4. Approved by Owner and Architect.

### 2.04 MATERIAL QUALITY

- A. All products shall be new and of top quality. Delivered to job site in unopened clearly labeled containers giving storage and handling recommendations, expiration dates and instructions for safe use.

## PART 3 - EXECUTION

### 3.01 STARTING OF SYSTEMS

- A. Personnel performing services pursuant to this section shall be fully trained and experienced tradesmen highly skilled in the work being performed and, where necessary or required, be factory trained and approved.
- B. Contractor shall provide all required or necessary safety equipment, warning signs, barricades, etc. so that all cleaning, disinfecting and adjusting operations will be completed without injury to personnel, equipment, property, etc.

- C. All cleaning of equipment, control/safety devices and systems shall be performed using approved top quality trade procedures, repeated if necessary, until every piece of equipment, control/safety device and system is clean and ready for operation is required and approved by manufacturer, governing agency and Architect.
- D. All adjusting and servicing of equipment, control/safety devices and systems shall be performed using top quality trade procedures in strict accord with manufacturer's recommendations, and governing agencies and Owner's requirements.
- E. The disinfecting of the potable cold and hot water systems shall be performed after the above specified cleaning, adjusting and servicing work has been completed and in strict accord with governing codes and agencies, manufacturer's recommendations and Owner's requirements. Contractor shall provide an approved laboratory's test showing test results. Disinfecting and laboratory report shows findings acceptable to governing agencies and Architect.
- F. Testing, adjusting and balancing of HVAC systems specified elsewhere shall be performed immediately after the applicable work specified above has been completed and approved.
- G. Contractor shall attest in writing and demonstrate to Architect that every piece of equipment, control/safety device, and system is clean, ready for operation and approved for operation by governing agencies.
- H. Contractor shall demonstrate to Architect and Owner's Representative by starting up and/or causing to function, that every piece of equipment, control/safety device and system will perform its intended function safely, noiselessly, per governing codes and as required by Architect. This work shall be performed by highly skilled tradesmen under direct supervision of manufacturer's factory trained and approved representatives under close surveillance of Contractor's and Owner's consultants.

END OF SECTION

## SECTION 01700

### CONTRACT CLOSEOUT

#### PART 1 - GENERAL

##### 1.01 REQUIREMENTS

- A. Comply with the requirements stated in the General Conditions of the Contract for Construction and the Supplementary Conditions for administrative procedures, fiscal provisions and legal submittals to close out the Work.
- B. Cleaning: Refer to Section 01710.
- C. Record Documents: Refer to Section 01720.

##### 1.02 REPAIRS

- A. All structures, sidewalks, pavement, planting and other items disturbed or damaged incident to construction work under this Contract shall be replaced by the Contractor as soon as possible, in a manner satisfactory to the Owner, Architect and Governing Agencies.

##### 1.03 SUBSTANTIAL COMPLETION

- A. When the Contractor considers the Work to be substantially complete, he shall submit to the Architect:
  - 1. A written notice that the Work is sufficiently complete, that the Owner may occupy the Work for the use for which it is intended, and is therefore substantially complete.
  - 2. List of items to be completed or corrected and dates scheduled for completion or correction of each item.
- B. Within a reasonable time after receipt of such notice, the Architect will schedule a date with the Owner's Representative, and the Architect and his consultants will make an inspection to determine the status of completion.
- C. Should the Architect determine that the Work is not substantially complete, he will promptly notify the Contractor in writing stating the reasons. The Contractor shall remedy the deficiencies in the Work and send a second notice of Substantial Completion to the Architect. The Architect will notify the Owner and reinspect the Work.
- D. When the Architect concurs that the Work is substantially complete, he will prepare a Certificate of Substantial Completion on AIA Document G704 accompanied by the Contractor's list of items to be completed or corrected (punch list) as verified and amended by the Architect. The Architect will submit the Certificate to the Contractor and Owner for their written acceptance.

##### 1.04 FINAL ACCEPTANCE

- A. When the Contractor determines the Work is complete he shall submit written certification that:
  - 1. Contract Documents have been reviewed.
  - 2. The Work has been inspected by a qualified person authorized by the Contractor for compliance with the Contract Documents.
  - 3. The Work has been completed in accordance with the Contract Documents.
  - 4. Equipment and systems have been tested and demonstrated in the presence of the Owner's Representative and are operational.
  - 5. Inspections, inspection certificates or letters of acceptance for items requiring approval from governing authority or authorities are complete and available.
  - 6. The Work is completed and ready for final inspection.

- B. Within a reasonable time after receipt of the certification the Architect will schedule a date with the Owner's Representatives, and the Architect and his consultants will make an inspection to verify completion.
- C. Should the Architect consider the Work incomplete or defective the Contractor will be notified in writing listing incomplete or defective Work. The Contractor shall take immediate steps to remedy the stated deficiencies and send a second written certification that the Work is complete. The Architect will notify the Owner and reinspect the Work.

#### 1.05 REINSPECTION FEES

- A. Should the Architect perform reinspections due to failure of the Work to comply with the claims of status of completion made by the Contractor:
  - 1. The Contractor will compensate the Architect for such additional services.
  - 2. Owner may deduct the amount of such compensation from the final payment due the Contractor.

#### 1.06 UTILITY TRANSFER

- A. It shall be the responsibility of the Contractor to coordinate the transfer of all utility services to the name of the Owner. This transfer shall be at the time of Substantial Completion, unless directed otherwise by the Owner.

#### 1.07 CONTRACTOR'S CLOSEOUT SUBMITTALS TO ARCHITECT FOR THE OWNER

- A. The closeout submittal shall be complete and submitted to the Architect as a single package. The package shall include two (2) copies of the following or other number as specified in the various Sections of the Project Manual. Refer to Section 01720 for specific requirements for preparation and submittal of Record Documents.
  - 1. Project Record Documents as required by Section 01720.
  - 2. Operating and Maintenance Data bound in commercial quality, three-ring binders with durable plastic covers.
  - 3. Shop Drawings and Product Data as required by Section 01340.
  - 4. Written guarantees as specified, bound in with Operating and Maintenance Data.
  - 5. Paint Schedule, consisting of color chip of each color used, paint manufacturer's name and color number, and room number where each color and type of paint is applied.
  - 6. Keys and Keying Schedule as called for in Section 08710, Finish Hardware.
  - 7. Spare Parts and Maintenance Materials as called for in various Sections of the Project Manual.
  - 8. Contractor's Affidavit of Payment of Debts and Claims, AIA Document G706.
  - 9. Affidavit of Release of Liens, AIA Document G706A.
  - 10. Consent of Surety to Final Payment, AIA Document G707.
  - 11. Occupancy Permits as required by local and governing agencies.
  - 12. Record Survey as specified in Section 01050.

#### 1.08 FINAL ADJUSTMENT OF ACCOUNTS

- A. The Contractor shall submit to the Architect the Final Application for Payment accompanied by a statement of accounting. The statement shall reflect all adjustments to the Contract Sum.
  - 1. The Original Contract sum
  - 2. Additions and Deductions resulting from:
    - a. Previous Change Orders
    - b. Allowances
    - c. Unit Prices
    - d. Deductions for non-conforming work
    - e. Deductions for Liquidated Damages
    - f. Deductions for reinspection payments
    - g. Other adjustments
  - 3. Total contract sum as adjusted
  - 4. Previous Payments
  - 5. Sum Remaining Due

- B. When the Architect has determined that the Closeout submittal is complete and correct and has received the final Application for Payment with the statement of accounting, he will prepare a Change Order reflecting the approved adjustments to the Contract sum which were not previously made by Change Order.
- C. The Architect will submit to the Owner the Consent of Surety, Releases of Liens, Final Application for Payment with the Statement of Accounting, and signed Change Order, if required, and other documents related to fiscal provisions with a cover letter (from the Architect) to certify that to the best of his knowledge, completion of the Project is in compliance with the Contract documents and the balance shown is due and payable.

END OF SECTION



## SECTION 01710

### CLEANING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Execution of daily cleaning during progress of the Work and at completion of the Work. If the Contractor fails to keep the project clean, as herein specified, the Owner shall do the cleaning, the cost of which shall be charged to the Contractor.

##### 1.02 DISPOSAL REQUIREMENTS

- A. Conduct daily cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by the manufacturer of the surface to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.
- D. Refer to particular sections of this Project Manual for items requiring special handling and cleaning.

#### PART 3 - EXECUTION

##### 3.01 PROGRESS CLEANING

- A. General
  1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of materials.
  2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for the construction of this work.
  3. Twice weekly, and more often if necessary, the Contractor shall completely remove all scrap, debris, and waste material from the job site, and shall place into container furnished by the Contractor.
  4. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection.
- B. Project Site: The Contractor shall:
  1. Daily, and more often if necessary, inspect the project site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
  2. Weekly, and more often if necessary, sweep all interior places clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material that can be removed by reasonable diligence using a hand-held broom.
  3. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using all equipment and materials required to achieve the required cleanliness.

4. Following the installation of finish floor materials, protect by covering with temporary coverings and/or clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials have been installed. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from all foreign material, which may be injurious to the finish floor material.

### 3.02 FINAL CLEANING

- A. Definition: Except as otherwise specifically provided, "Clean" (for the purpose of this Article) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance Subcontractors using commercial quality building maintenance equipment and materials.
- B. General: Prior to completion of the work, remove from the job site all tools, temporary structures, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.01 above.
- C. Interior: Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only the specified cleaning materials and equipment.
- D. Repair, patch, and touch-up marred or damaged surfaces to match adjacent finishes.
- E. Clean the following if located within the project area:
  1. Plumbing Fixtures, Strainers and Floor Drains
  2. Light Fixtures and Lamps
  3. Replace filters of ventilating equipment when units have been operating during construction. In addition, clean grilles and louvers.
  4. Excess lubrication is to be removed from mechanical and electrical equipment.
  5. All Electrical Panels
- F. Clean all transparent materials, including glass and mirrors. Remove glazing compound and other substances that are noticeable from vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
- G. Remove labels that are not permanent labels.
- H. Polished and Resilient Surfaces: To all surfaces requiring the routine application of protective waxes and/or buffed polish, apply coating and/or polish as recommended by the manufacturer of the material being treated.
- I. Clean hard tile and stone as work progresses, preventing accumulation of setting and grouting materials or debris on tile faces. Clean glazed tile and thresholds using solution of detergent and water only. Cleaning glazed tile and thresholds with acids is prohibited.
- J. Leave concrete floors broom clean. Vacuum carpeted surfaces.
- K. Clean areas traversed by construction personnel.
- L. Clean the site, including landscape development areas, of construction rubbish, litter, and other foreign substances left on site as a result of construction operations. Sweep paved areas broom clean. Remove stains, spills, and other foreign deposits.
  1. Wash walks, steps, terraces, curbs, drives and paved areas free of mud or other foreign stains, where such has become contaminated with construction debris.
  2. Clean finish surfaces and site improvements of dirt, stains and foreign matter, where such has become contaminated with construction debris.
  3. Clean storm drainage systems to provide for free flow of storm water where such has become contaminated with construction debris.



- M. Roof
  - 1. Remove all construction debris from each roof.
  - 2. Verify that all roof drains, gutters and downspouts are clear and will provide free flow of storm water.
  - 3. Remove leaves and other foreign matter from the surface of each roof where work has been performed.
- N. Maintain cleaning until the Date of Substantial Completion.
- O. Timing: Schedule final cleaning as to enable the Owner to accept a completely clean project.

END OF SECTION



SECTION 01720  
RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes maintenance at the site for the Owner one copy of:
  - 1. Drawings
  - 2. Project Manual
  - 3. Addenda
  - 4. Change Orders and other Modifications to the Contract
  - 5. Architect Field Orders and Written Instructions
  - 6. Approved Shop Drawings, Project Data and Samples
  - 7. Field Test Reports
  - 8. Record Survey
  
- B. Related Requirements in Other Parts of the Project Manual:
  - 1. Conditions of the Contract
  - 2. Field Engineering

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and samples in Contractor's field office apart from documents used for construction.
  - 1. Provide files and racks for storage of documents.
  - 2. Provide locked cabinet or secure space for storage of samples.
  
- B. File documents and samples in accordance with Data Filing Format of the Uniform Construction Index.
  
- C. Maintain documents in a clean, dry, legible condition and in good order. Record Documents shall not be used for construction purposes.
  
- D. Make documents and samples available at all times for inspection by the Architect and Owner.
  
- E. Prepare Record Drawings by marking a set of Contract Drawings (marked up Xerox bond prints) at the Construction Site. Record Drawings shall be furnished to the Architect for the Owner at the completion of the Work.

1.03 RECORDING

- A. Label each document "PROJECT RECORD" in neat, large, printed letters
  
- B. Record information concurrently with construction progress.
  - 1. Do not conceal any work until required information is recorded.
  
- C. Drawings: Legibly mark to record actual construction:
  - 1. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
  - 2. Field changes of dimension and detail.
  - 3. Changes made by Field Order and Change Order.
  - 4. Details not on original Contract Drawings, such as Supplemental (SUP) drawings.

- D. Specifications and Addenda: Legibly mark each Section to record:
1. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.
  2. Changes made by Field Order and Change Order.

#### 1.04 PROJECT DATA BINDERS

- A. Furnish two (2) complete sets of Project Data in commercial quality ring binders with durable plastic covers in black. Identify the project on the face side of the binder. If multiple binders are required, identify each as consecutively numbered volumes. The original documents shall be considered as set number one.
- B. Introductory Information
1. Cover sheet or sheets giving complete Project title, Contractor's name, address, telephone number, name of project superintendent, project manager and related general information.
  2. Provide a complete listing of subcontractors and material suppliers, including company name, address, telephone number, contact person and local representative.
  3. Table of Contents for each Section.
- C. Certificates and Acceptance
1. Section Table of Contents.
  2. Contractor's certification as required in Section 01700.
  3. Certificate of Substantial Completion.
  4. Certificate of Inspection or Letter of Acceptance from Public Health Department.
  5. Copy of Occupancy Certificate.
- D. Warranties and Bonds
1. Section Table of Contents.
  2. Contractor's Warranty of the Work.
  3. Warranties and service/maintenance contracts, executed by each of the respective manufacturers, suppliers and subcontractors as specified in respective Sections of the Specifications.
  4. Complete information for each item of work with the beginning date and duration of warranty or service maintenance contract and information on conditions which might affect the validity and proper procedure in case of failure.
- E. Operating and Maintenance Data
1. Section Table of Contents.
  2. List, with each system or product, the name, address and telephone number of the responsible subcontractor or installer. Give Drawing and Specification reference, project location, manufacturer and model number, local supplier and maintenance service company for each item.
  3. Data for maintenance and operation of all major mechanical and electrical systems, equipment, and products furnished under the contract. For each item of equipment, system or product, as appropriate or as specified, provide the following.
    - a. Description and component parts.
    - b. Operating and maintenance procedures, including manufacturer's printed operating and maintenance instructions, supplemented with drawings and written text as necessary to clearly illustrate proper operation. Provide a logical sequence of instructions for each procedure.
    - c. Servicing and lubrication schedule with a list of lubricants required.
    - d. Manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
    - e. Instructions for care, with a list of manufacturer's recommended types of cleaning agents and methods.
    - f. Product data that clearly identifies the specific product or part installed. When manufacturer's cut sheets are used for product identification, plainly mark the specific items included in the work.
    - g. List materials and parts furnished for the Owner's use.
  4. Prior to final inspection, demonstrate operation of each system to the Architect and the Owner's Representative. Instruct Owner's personnel in the operation, adjustment and maintenance of equipment and systems, using the operating and maintenance data as the basis of instruction.

1.05 SUBMITTAL

- A. At Contract Close-Out, deliver all Record Documents to the Architect for the Owner.
- B. Accompany submittal with transmittal letter in duplicate, containing:
  - 1. Date
  - 2. Project title and number
  - 3. Contractor's name and address
  - 4. Title and number of each Record Document
  - 5. Signature of Contractor or his authorized representative

END OF SECTION



SECTION 02000  
GEOTECHNICAL DATA

PART 1 – GENERAL

1.01 SUMMARY

A. These documents include a:

Subject: Geotechnical Investigation for Proposed Trumann Fire Station

Authored by: Anderson Engineering Consultants, Inc.  
10205 Rockwood Road  
Little Rock, Arkansas 72204

Prepared for: Miller-Newell Engineers, LTD and the City of Trumann, Arkansas

Dated: November 23, 1998

B. Extent of Inclusion of the Report: The entire report is bound herein.

C. Investigation: Visit the site and become acquainted with existing site conditions, including but not limited to, existing subsurface utilities and structures.

D. Site Information: Data concerning subsurface conditions are not intended as representations or warranties of accuracy or continuity between soil borings. Commentary in the report is the opinion solely of the Soil Investigator. It is expressly understood that neither the Owner nor the Architect/Engineer is responsible for interpretations or conclusions drawn therefrom by the contractor. Data is made available for the convenience of the Contractor. The Contractor may make additional test borings and other exploratory operations. All costs incurred in further explorations shall be paid by the Contractor.

E. After demolition and removal of the existing structures, the Contractor shall call for an evaluation of the soil by the Geotechnical Engineer. The Engineer shall propose necessary methods of soil testing and specify removal, replacement, processing, or other requirements for earthwork preparation. The Geotechnical Engineer shall work directly for the Owner.

F. The Geotechnical Engineer shall propose testing and specify earthwork in accordance with Section 01410, Division 2, Division 3, and Division 5 of this Project Manual, where practicable. If other methods and procedures are required, the scope, equipment, standards, methods, and procedures shall be clearly described.

G. The Geotechnical Engineer shall provide a fee for construction testing and specifications for the review by the Architect, prior to approval by the Owner.

END OF SECTION





**GEOTECHNICAL INVESTIGATION**

**FOR**

**PROPOSED FIRE STATION**

**TRUMANN, ARKANSAS**

\* \* \* \* \*

**MILLER-NEWELL ENGINEERS, LTD.**

**ENGINEERS**

**P. O. BOX 717**

**NEWPORT, ARKANSAS 72112**

\* \* \* \* \*

**NOVEMBER 23, 1998**

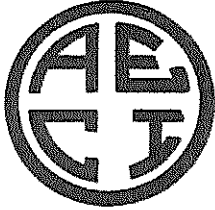
**JOB NO. 6622**



**ANDERSON ENGINEERING CONSULTANTS, INC.**

10205 ROCKWOOD ROAD -- LITTLE ROCK, ARKANSAS 72204

PHONE (501) 455-4545 FAX (501) 455-4552



# ANDERSON ENGINEERING CONSULTANTS, INC.

10205 ROCKWOOD ROAD -- LITTLE ROCK, ARKANSAS 72204

PHONE (501) 455-4545 FAX (501) 455-4552

November 23, 1998

Job No. 6622

Mr. Albert H. Miller, P.E.  
Miller-Newell Engineers, LTD  
P. O. Box 717  
Newport, Arkansas 72112

Re: Geotechnical Investigation  
Proposed Fire Station  
Trumann, Arkansas

Dear Mr. Miller:

It is our pleasure to submit this report on the soil and foundation investigation for the proposed Fire Station at Trumann, Arkansas. The investigation consisted of field test borings, soils laboratory analyses, foundation design analyses, and pavement recommendations.

We recommend that our geotechnical services be continued in the foundation construction phases of the project for this is the most feasible means of assuring the owners, designers, and builders that the geotechnical design intent is being achieved. In the event adverse geotechnical conditions are encountered during excavation, they can be identified and evaluated so adequate remedial measures can be implemented during construction.

We wish to express our appreciation for the opportunity of serving you and members of the design team. Our Jonesboro, Arkansas, office is close to the project site and is available to provide testing during construction. We are available for further assistance at any time during final design and construction, should you desire additional consultation.

Very truly yours,

ANDERSON ENGINEERING CONSULTANTS, INC.

Bobby Van Cleave, E.I.  
Staff Engineer

Scott W. Anderson, P.E.  
Senior Geotechnical Engineer



BVC/SWA/acc  
6622.GEO

ANDERSON ENGINEERING CONSULTANTS, INC.  
10205 ROCKWOOD ROAD LITTLE ROCK, ARKANSAS 72204

GEOTECHNICAL INVESTIGATION  
FOR  
PROPOSED FIRE STATION  
TRUMANN, ARKANSAS

\* \* \* \* \*

MILLER-NEWELL ENGINEERS, LTD  
ENGINEERS  
P. O. BOX 717  
NEWPORT, ARKANSAS 72112

\* \* \* \* \*

BY  
ANDERSON ENGINEERING CONSULTANTS, INC.  
GEOTECHNICAL CONSULTANTS  
10205 ROCKWOOD ROAD  
LITTLE ROCK, ARKANSAS 72204

NOVEMBER 23, 1998      JOB NO. 6622

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ABSTRACT

Proposed Fire Station .....	Job No. 6622
Date of Borings .....	11/05/98
Number of Borings .....	5
Maximum Depth Investigated .....	16.5 feet
Type of Samples .....	Standard Penetration
General Stratigraphy: The overall stratigraphy consists of a thin layer of silty clay (CL) underlain by silty sand (SM) to the full depths investigated.	
Water Table (Static) .....	8.0 feet
Frost Depth .....	8.0 inches
Earthwork (Specify) .....	98% ASTM D 698 within 2% of optimum moisture
Borrow Area Soils	
On-Site .....	Suitable for use as fill when dried and compacted
Off-Site (Specify) .....	Select PI < 15 Non-Expansive
Conventional Footings or Monolithic Slab	
Bearing Capacity .....	1300 psf
Bearing Depth (from existing grade) .....	2.0 feet
Total Settlement .....	0.80 inch
Differential Settlement .....	0.50 inch

NOTE: Undercutting of soft or wet soils may be required in the building and parking areas.

Abstract - Continued

Pavements		<u>Light Duty</u>	<u>Heavy Duty</u>
Flexible:	HMAC .....	2.0"	3.0"
	Crushed Stone or Clay-Gravel Base .....	6.0"	8.0"
	Compacted Subgrade .....	6.0"	8.0"
Rigid:	Concrete .....	5.0"	7.0"
	Crushed Stone or Clay-Gravel Base .....	4.0"	4.0"
	Compacted Subgrade .....	8.0"	8.0"

Note: A subgrade support fabric such as Mirafi 500X is required between the compacted select fill and the natural ground. Undercutting of soft soils may be required to accommodate placement of select fill.

### APPLICABLE NOTES

1. Geotechnical Engineering and Quality Control Testing services by this firm are recommended during construction.
2. We have endeavored to analyze the site foundation conditions in accordance with basic geotechnical engineering principles; however, we are not aware of all the loading or structural conditions. Therefore, we suggest that your professional staff carefully review our report for any design criteria for which we may not be familiar, or for which we may have inadvertently omitted. Accordingly, the contractual documents should advise that no claims will be allowed as a result of our geotechnical investigation and recommendations.
3. If any conditions are encountered during final design and/or during construction which are materially different than those presented in this report or assumed to exist at the site, this firm should be notified at once so that we may have an opportunity to make further studies and recommendations.
4. This publication is intended for the use of professional personnel competent to evaluate the significance and limitations of its contents and who will accept responsibility for the applications of the material it contains.
5. It is considered prudent and recommended that the soils engineer be consulted further during the final stages of design, and the preparation of plans and specifications, to ascertain that the earthwork and foundation recommendations have been interpreted and implemented basically in accordance with our intent. It thus may be necessary to submit supplementary recommendations to assure compatibility of these items. All communications concerning this report must be made in writing.
6. This geotechnical engineering investigation report is not intended to be utilized as an earthwork specification for construction.
7. Unused soil samples will be retained for inspection and/or further use for only 30 days unless specifically requested otherwise.
8. It should be understood that the assessment of site environmental conditions or the presence of contaminants in the soil, rock, surface water or groundwater of the site was beyond the scope of this study, unless otherwise noted.

## IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL ENGINEERING REPORT

As the client of a consulting geotechnical engineer, you should know that site subsurface conditions cause more construction problems than any other factor. ASFE/The Association of Engineering Firms Practicing in the Geosciences offers the following suggestions and observations to help you manage your risks.

### **A GEOTECHNICAL ENGINEERING REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS**

Your geotechnical engineering report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. These factors typically include: the general nature of the structure involved, its size, and configuration; the location of the structure on the site; other improvements, such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask your geotechnical engineer to evaluate how factors that change subsequent to the date of the report may affect the report's recommendations.

Unless your geotechnical engineer indicates otherwise, do not use your geotechnical engineering report

- when the nature of the proposed structure is changed, for example, if an office building will be erected instead of a parking garage, or a refrigerated warehouse will be built instead of an unrefrigerated one;
- when the size, elevation, or configuration of the proposed structure is altered;
- when the location or orientation of the proposed structure is modified;
- when there is a change of ownership; or
- for application to an adjacent site.

Geotechnical engineers cannot accept responsibility for problems that may occur if they are not consulted after factors considered in their report's development have changed.

### **SUBSURFACE CONDITIONS CAN CHANGE**

A geotechnical engineering report is based on conditions that existed at the time of subsurface exploration. Do not base construction decisions on a geotechnical engineering report whose adequacy may have been affected by time. Speak with your geotechnical consultant to learn if additional tests are advisable before construction starts. Note, too, that additional tests may be required when subsurface conditions are affected by construction operations at or adjacent to the site, or by natural events such as floods, earthquakes, or ground water fluctuations. Keep your geotechnical consultant apprised of any such events.

### **MOST GEOTECHNICAL FINDINGS ARE PROFESSIONAL JUDGMENTS**

Site exploration identifies actual subsurface conditions only at those points where samples are taken. The data were extrapolated by your geotechnical engineer who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your geotechnical engineer can work together to help minimize their impact. Retaining your geotechnical engineer to observe construction can be particularly beneficial in this respect.

### **A REPORT'S RECOMMENDATIONS CAN ONLY BE PRELIMINARY**

The construction recommendations included in your geotechnical engineer's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Because actual subsurface conditions can be discerned only during earthwork, you should retain your geotechnical engineer to observe actual conditions and to finalize recommendations. Only the geotechnical engineer who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations are valid and whether or not the contractor is abiding by applicable recommendations. The geotechnical engineer who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

### **GEOTECHNICAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND PERSONS**

Consulting geotechnical engineers prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your geotechnical engineer prepared your report expressly for you and expressly for purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the geotechnical engineer. No party should apply this report for any purpose other than that originally contemplated without first conferring with the geotechnical engineer.

### **GEOENVIRONMENTAL CONCERNS ARE NOT AT ISSUE**

Your geotechnical engineering report is not likely to relate any findings, conclusions, or recommendations



## PURPOSE

The primary purposes of this geotechnical investigation were:

- a. To determine the physical and engineering properties of the soils within the area of the proposed construction with respect to their suitability for the support of the proposed facility.
- b. To make recommendations for the earthwork, type of foundation and pavements suited for the prevailing soil conditions within the proposed construction area.
- c. To evaluate and recommend the design procedures for the various soil, foundation and pavement items in accordance with current engineering practices.

## SCOPE

The scope of this geotechnical investigation includes the following:

- a. The geological features of the job site area consist essentially of alluvial sands and clays to the full depths investigated. Thus, the site stratigraphy was defined by four continuous flight auger borings terminated at from 6.5 to 16.5 feet.
- b. Field testing consisted of Standard Penetration test samples taken in two of the borings. Soils were visually classified in the field by a soils engineering technician.
- c. The soils analyses were based on N-values obtained from the Standard Penetration tests, visual observations, and other routine inspection and classification methods. The soils were classified basically in accordance with the Unified Soils Classification System and visual classifications are given on the logs. Due to the granular nature of the site soils, laboratory testing was not performed.

- d. The foundation bearing capacity and settlement analyses were based on AECI's current foundation design procedures, using the Standard Penetration N-values obtained during drilling and the results of the laboratory testing program.
- e. The flexible and rigid pavement designs shown in this report are based on the CBR design method estimated from field and laboratory tests on the top 5.0 feet of soil in the pavement areas of the site.

#### AUTHORITY

This geotechnical investigation was authorized on October 20, 1998, by Mr. Albert Miller, P.E. of Miller-Newell Engineers LTD, the owner's representative for the proposed project by signed acceptance of AECI Proposal No. 98467.

#### GEOTECHNICAL INVESTIGATION

On November 4 and 5, 1998, five geotechnical test borings were made at the site of the proposed project in Trumann, Arkansas. The site is located as shown on the Vicinity Map, Plate 1. The borings were placed on site as shown on the Plan of Borings, Plate 2. The logs of the borings are given on Plates 3 through 6. The Field Classification System for Soil Exploration and Key to the Soil Classifications and Symbols are given on Plates 7 and 8, respectively. The Unified Soils Classification System is given on Plate 9.

### GEOLOGY AND STRATIGRAPHY

The site of the proposed project is located at the southwest corner of West Main Street and U.S. Highway 63, and is bounded on the east side by Pine Avenue in the City of Trumann, Arkansas. The proposed site is a vacant lot and grass covered. The site at the time of investigation was relatively flat to gently sloping. Since the site is poorly drained, access will be difficult after stripping during rainy weather.

The geology of the Trumann, Arkansas, area consists of alluvial and terrace deposits of silts, sands and clays of the Quaternary alluvium geologic groups. The soils range, in general, from clays to sands. The site soils are consistent with the area geology. The site stratigraphy consists of a thin layer of stiff silty clay (CL) underlain by very loose to medium dense silty sand (SM) to the full depths investigated.

The long term static groundwater was encountered within the depths investigated in the test borings from 8.0 to 10.0 feet. Thus, it may be assumed that it will have some effect on design and construction of the proposed project. The groundwater may be encountered in wetter months within the top 3.0 feet of the site and will have a tendency to collect in deeper utility or foundation excavations and thus, temporary dewatering by gravity, ditches or pumping will be required to place foundations or backfill utility trenches.

**SEISMICITY**

The seismic analyses should include the selection of an appropriate site coefficient established from the subsurface conditions. The structure's foundations should be designed using guidelines as set forth in Arkansas Act 1100-1991 (as amended).

The predominant soil type is medium dense silty sand (SM) overlain by silts and silty clays. Based upon the subsurface soil conditions and the Arkansas State Building Services guidelines, the following data are considered applicable.

Seismic Zone . . . . .	3
Soil Profile Type . . . . .	S <sub>3</sub>
Soil Coefficient . . . . .	1.5
Peak Acceleration Coefficient (A <sub>a</sub> ) . . . . .	0.24
Effective Peak Velocity-Related Acceleration Coefficient (A <sub>v</sub> ) . . . . .	0.24

Based on the low (N<10) values compounded by a high water and varied silty soils, liquefaction appears imminent at this location under extreme seismic stress. A registered structural engineer should review all foundation plans prior to construction to determine foundation stability against seismic forces.

**EARTHWORK**

The field test data indicates that the silty clay (CL) or silty sand (SM) surface soils will have moderate to poor compaction and strength properties due to their type and high natural moisture content. These soils will require significant drying to achieve optimum moisture

content. The overburden soils will pump readily when the moisture content surpasses optimum moisture content. The contractor should be prepared to provide temporary construction drainage and equipment to facilitate drying of the wet soils. Undercutting and replacement may also be required in the building and paving areas due to very soft, wet, silts. Choking or bridging of soft soils with clay gravel may be required to stabilize the site to allow mobility of construction equipment.

It is recommended that 98% Standard compaction be used in all earthwork for buildings and pavement areas. Soils in the upper 4.0 feet of the site are not suitable for use as fill due to their moisture content and should be avoided unless dried. Any off-site borrow soils required should be clay gravel (GC) or clayey sand (SC) type soils and have a PI of less than 15. All fill soils should be placed in 8.0-inch lifts with a moisture content within two percentage points of optimum moisture content. A geotextile such as Mirafi 500X may greatly aid in stabilization of undercut areas in building and parking areas. A unit rate for this item should be included in the bidding documents so that construction delays can be minimized.

### FOUNDATIONS

Conventional spread footings or a reinforced monolithic slab foundation can perform satisfactorily for the support of the proposed facility when properly constructed. The bearing capacity for footings founded on the silty clay (CL) natural ground is 1300 psf at a depth of 2.0 feet as shown by the calculations and curve given on Plates 10 and 11. An explanation of bearing capacity calculations is provided on Plate 12.

The magnitude of anticipated settlement is a function of the longtime applied load to the foundations and the compressibility of the supporting soils within the depth of significant stresses. Based upon a  $Q_a$  equal to 1300 psf, we recommend that the foundation be designed for a total settlement of 0.80 inch and a corresponding differential settlement of 0.50 inch as long as the span between adjacent columns comply with the local building codes and that there is no imperfections in the bearing strata of the footing excavations.

Evaluation by the soils engineer or his representative is recommended to verify that the allowable bearing value has not been reduced by disturbance due to excavating and/or massive imperfections in the bearing strata, in which case deeper excavations will be required and/or the subgrade improved to yield the design bearing value. Any areas undercut shall be backfilled with clay gravel as previously recommended.

### FLOOR SLABS

Differential movement of the floor slab may be caused by a difference in the allowable gross bearing capacity, differing heave and/or variable thicknesses of compressible soils below the floors. A 6.0-inch thick layer of <sup>granular material (sand)</sup> ~~clay gravel~~ fill should be used as a ~~vapor barrier~~ and shall be compacted to at least 98% Standard compaction. A modulus of subgrade reaction (k) equal to 125 pci can be used for design of floor slabs if all other earthwork criteria are met.

## PAVEMENTS

The following pavement designs and pavement recommendations are based on numerous reasonable assumptions concerning the pavement use, site conditions, and maintenance. The pavement designs presented herein are based on the earthwork recommendations presented earlier and an assumed CBR value of 4 based on correlation with the soil physical properties. AECI must be notified immediately of any soils or site conditions which vary from those assumed herein.

### Flexible Pavement

Based upon a CBR of 4, the required parking lot pavement structure for light duty pavement would consist of 6.0 inches of compacted subgrade, 6.0 inches of clay gravel base course (AHTD Class 5), and 2.0 inches (AHTD Type II) of hot mix. For heavy duty pavements, 8.0 inches of compacted subgrade, 8.0 inches of clay gravel base, and 3.0 inches of hot mix would be required. The recommended flexible pavement structures are shown on Plate 13. The base course should be compacted to a minimum of 100% Standard compaction to properly support the flexible pavement.

### Rigid Pavement

As an option to the proposed flexible pavement, a non-reinforced concrete pavement may be utilized. The light duty pavement areas should consist of 5.0 inches of concrete, 4.0 inches of clay gravel base, and 6.0 inches of compacted subgrade. The heavy duty pavement areas, including access to dumpsters or truck docks, should consist of 7.0 inches of concrete, 4.0 inches of clay gravel base, and 8.0 inches of compacted subgrade. Plate 13 shows the

recommended rigid pavement structures. The base course should be compacted to a minimum of 100% Standard compaction to properly support the concrete pavement. The paving concrete should have a minimum 28-day compressive strength of 4000 psi and be entrained with 5% air as recommended by the ACI code. The jointing pattern and load transfer devices should be as recommended by the ACI and the PCA criteria.

### CONCLUSIONS AND RECOMMENDATIONS

As a result of this geotechnical investigation, the following recommendations are offered for consideration:

1. As previously discussed, conventional footings or a reinforced monolithic slab, enhanced for rigidity, would serve satisfactorily for the proposed structure. It is concluded that this will be an economical type of foundation and should be designed in accordance with the necessary structural and/or architectural requirements determined by the designers with the owner's ultimate approval.
2. The conventional footings or monolithic slab foundations should be designed utilizing a maximum allowable bearing of 1300 psf at a depth of 2.0 feet from existing grade.
3. Soil in the upper 4.0 feet of the site will not be suitable for use as fill without significant drying; thus, off-site non-expansive granular fill shall be placed in 8.0-inch thick lifts and be compacted within two percentage points of optimum moisture content to 98% Standard Proctor density as per ASTM D 698. The select off-site fill shall not have a PI in excess of 15. Clay-gravel (GC) or clayey sand (SC) are the most suitable structural fill for this project.

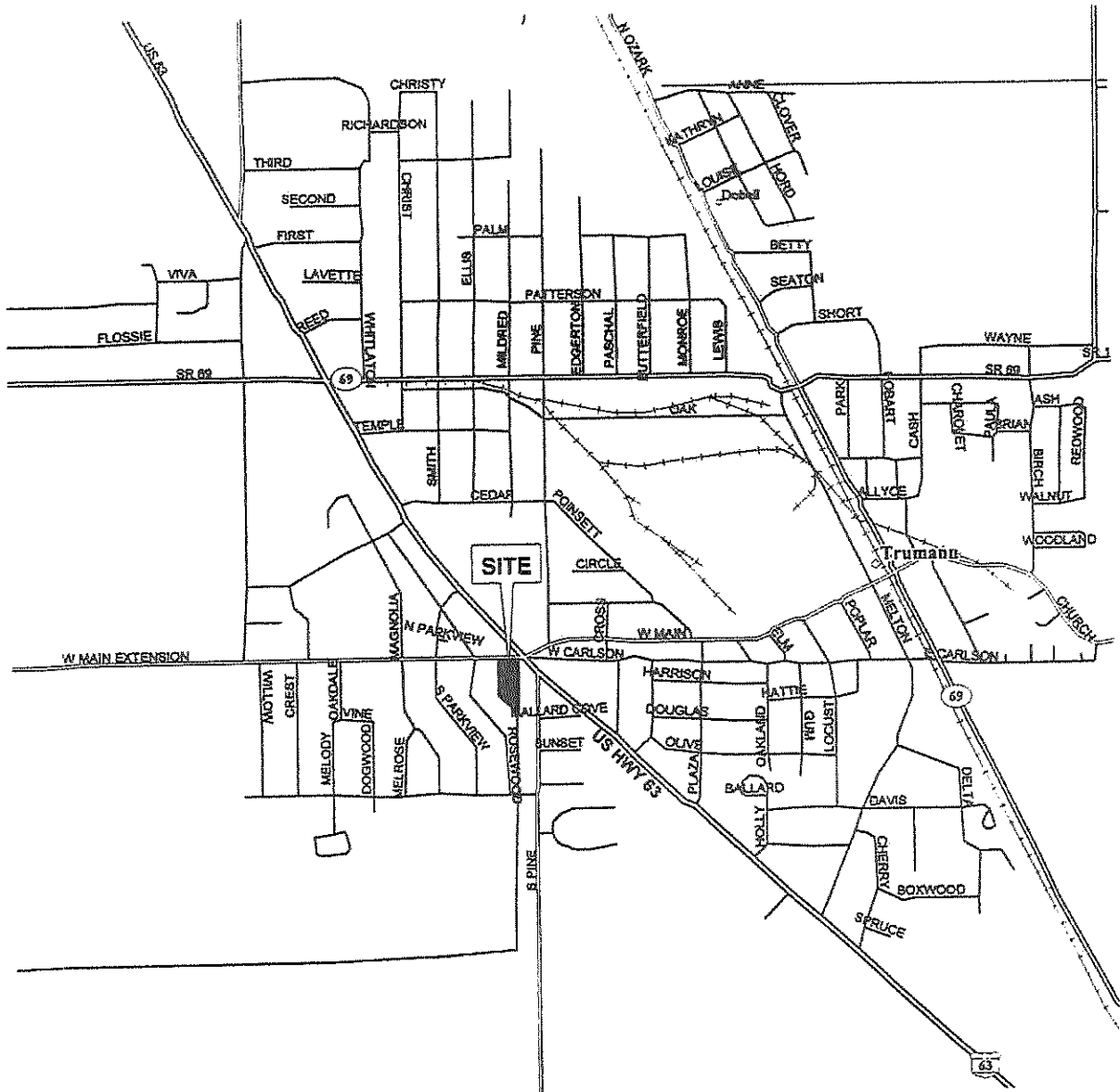


4. Draining of any perched water encountered during construction and undercutting of soft, wet or pumping silts may be required in the building areas. The contractor should be prepared to make select fill available to facilitate foundation and pavement construction.
5. All utility excavations to be backfilled should be well compacted using clay gravel (GC) fill at 98% of Standard compaction. A good surface and subsurface drainage system will aid the performance life of pavements and utilities.
6. Quality control testing should be utilized in the construction of the foundation, undercutting, fill placement, and floor slab construction with adequate testing to verify that the design requirements have been achieved.
7. Geotechnical engineering services should be utilized in the foundation construction phase, and our recommendations are based upon this so that adequate compensation can be made for conditions that may occur which differ significantly from those assumed as a result of this investigation.
8. Other recommendations are given throughout the text of this report.

\* \* \* \* \*

**APPENDIX A**  
**PLATES**

ANDERSON ENGINEERING CONSULTANTS, INC.  
10205 ROCKWOOD ROAD LITTLE ROCK ARKANSAS 72204



©1993 DeLorme Mapping  
MAP FROM DELORME'S MAPEXPERT, FREEPORT, MAINE

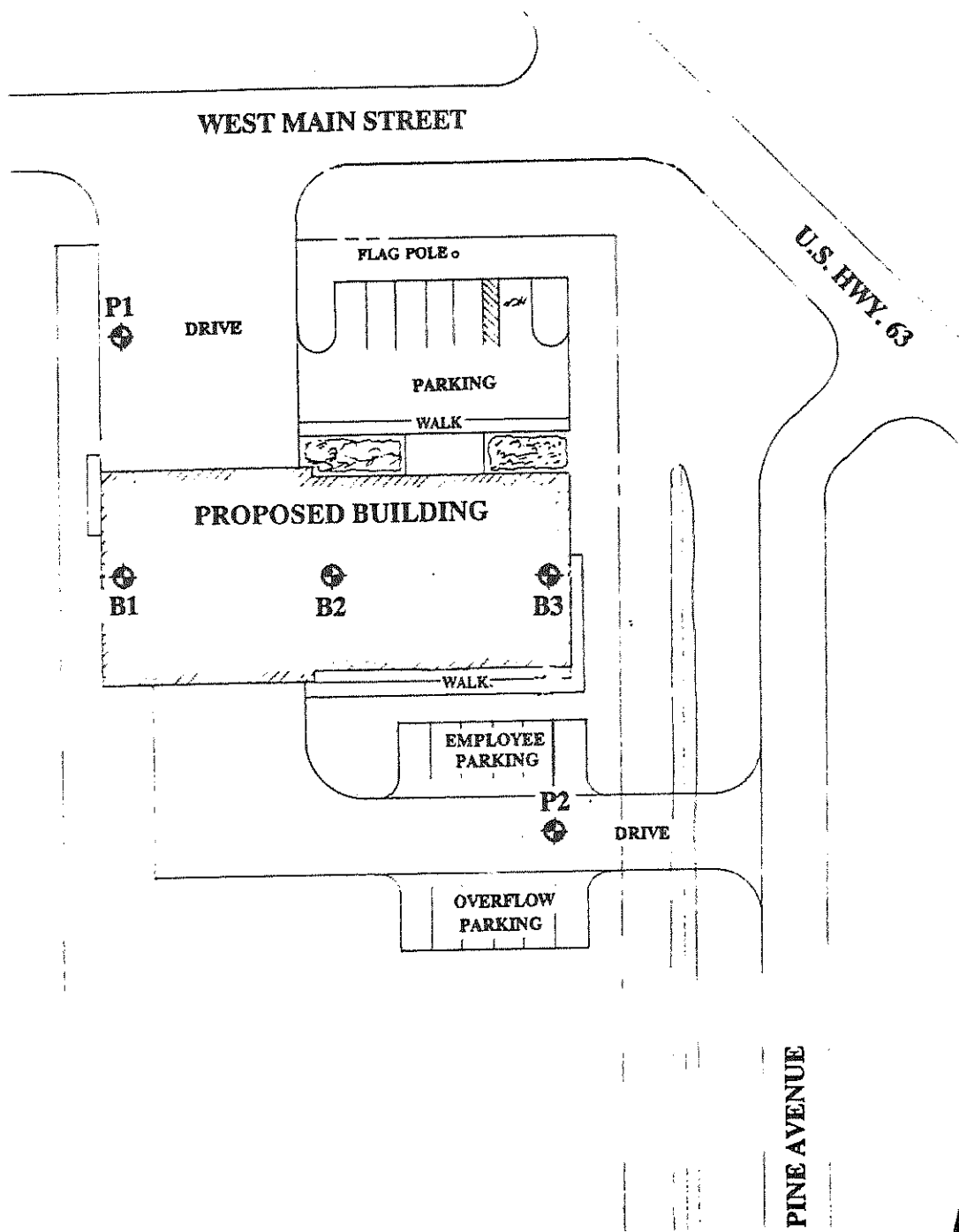


# VICINITY MAP

## TRUMANN, ARKANSAS

Geotechnical Engineering - Environmental Assessments - Quality Control Of Construction Materials

NOT DRAWN TO SCALE.



# PLAN OF BORINGS



AECI COPYRIGHT © 1998

LOG OF BORING

PROJECT: PROPOSED TRUMANN FIRE STATION  
TRUMANN, ARKANSAS

BORING NO: B1

FOR: MILLER, NEWELL ENGINEERS

LOCATION: SEE PLAN OF BORINGS

DATE: 11/05/98

JOB NO: 6622

BORING TYPE: AUGER W/SPT

DRILLER: STONE  
SIMCO 2400

GEOTECHNICIAN: ROACH

GROUND ELEVATION: NOT FURNISHED

Depth In Feet	Sample Type & No.	N-Blows Per Foot	Graphic Symbol	LEGEND		
				S Shelby Tube	NX Diamond Core	P Penetration Test
				⊠ Standard Penetration	⏏ J-Jar	
			∇ Static Water Table	∇ Hydrostatic Water Table	⊠ No Recovery	
VISUAL DESCRIPTION OF STRATUM						
0				5.0 INCHES OF TOPSOIL		
	P1	8		STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 TSF		
	P2	6		LOOSE MOIST BROWN SILTY SAND (SM)		
5	P3	13		MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
	P4	10	∇	MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
10	P5	4		VERY LOOSE MOIST BROWN SILTY SAND (SM)		
15	P6	7		LOOSE MOIST BROWN SILTY SAND (SM)		
20				BOTTOM OF HOLE AT 16.5 FEET IN SILTY SAND (SM). BORING CAVED AT 10.0 FEET. WATER WAS ENCOUNTERED AT 8.0 FEET DURING DRILLING. WATER LEVEL AT 8.0 FEET UPON COMPLETION OF DRILLING.		
25						
30						
35						

## LOG OF BORING

**PROJECT:** PROPOSED TRUMANN FIRE STATION  
 TRUMANN, ARKANSAS  
**FOR:** MILLER, NEWELL ENGINEERS  
**DATE:** 11/05/98      **JOB NO:** 6622  
**DRILLER:** STONE      **GEOTECHNICIAN:** ROACH  
 SIMCO 2400

**BORING NO:** B2  
**LOCATION:** SEE PLAN OF BORINGS  
**BORING TYPE:** AUGER W/SPT  
**GROUND ELEVATION:** NOT FURNISHED

Depth In Feet	Sample Type & No.	N-Blows Per Foot	Graphic Symbol	LEGEND		
				S Shelby Tube	NX Diamond Core	P Penetration Test
				☒ Standard Penetration	☐ J-Jar	
			∇ Static Water Table	∇ Hydrostatic Water Table	☒ No Recovery	
VISUAL DESCRIPTION OF STRATUM						
0			☒	5.0 INCHES OF TOPSOIL		
	P1	7	☒	STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 TSF		
	P2	8	☒	LOOSE MOIST BROWN SILTY SAND (SM)		
5	P3	14	☒	MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
	P4	13	☒	MEDIUM DENSE MOIST GRAYISH BROWN SILTY SAND (SM)		
10	P5	15	☒	MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
			∇	WATER LEVEL AT 10.0 FEET		
15	P6	2	☒	VERY LOOSE MOIST GRAYISH BROWN SILTY SAND (SM)		
20				BOTTOM OF HOLE AT 16.5 FEET IN SILTY SAND (SM). BORING REMAINED OPEN. WATER WAS ENCOUNTERED AT 10.0 FEET DURING DRILLING. WATER LEVEL AT 10.0 FEET UPON COMPLETION OF DRILLING.		
25						
30						
35						

LOG OF BORING

PROJECT: PROPOSED TRUMANN FIRE STATION  
TRUMANN, ARKANSAS

BORING NO: B3

FOR: MILLER, NEWELL ENGINEERS

LOCATION: SEE PLAN OF BORINGS

DATE: 11/04/98

JOB NO: 6622

BORING TYPE: AUGER W/SPT

DRILLER: STONE  
SIMCO 2400

GEOTECHNICIAN: ROACH

GROUND ELEVATION: NOT FURNISHED

Depth In Feet	Sample Type & No.	N-Blows Per Foot	Graphic Symbol	LEGEND		
				S Shelby Tube	NX Diamond Core	P Penetration Test
				□ Standard Penetration	□ J-Jar	
			▽ Static Water Table	▽ Hydrostatic Water Table	□ No Recovery	
VISUAL DESCRIPTION OF STRATUM						
0				5.0 INCHES OF TOPSOIL		
	P1	8		STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 TSF		
	P2	7		MEDIUM STIFF MOIST BROWNISH GRAY SILTY CLAY (CL) PP = 0.75 TSF		
5	P3	12		MEDIUM DENSE MOIST BROWNISH GRAY SILTY SAND (SM)		
	P4	16	▽	MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
10	P5	13		MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
15	P6	2		VERY LOOSE MOIST BROWN SILTY SAND (SM)		
20				BOTTOM OF HOLE AT 16.5 FEET IN SILTY SAND (SM). BORING REMAINED OPEN. WATER WAS ENCOUNTERED AT 8.0 FEET DURING DRILLING. WATER LEVEL AT 8.0 FEET UPON COMPLETION OF DRILLING.		
25						
30						
35						

**LOG OF BORING**

PROJECT: PROPOSED TRUMANN FIRE STATION  
TRUMANN, ARKANSAS  
FOR: MILLER, NEWELL ENGINEERS

BORING NO: P1  
LOCATION: SEE PLAN OF BORINGS

DATE: 11/05/98 JOB NO.: 6622

BORING TYPE: AUGER W/SPT

DRILLER: STONE  
SIMCO 2400

GEOTECHNICIAN: ROACH

GROUND ELEVATION: NOT FURNISHED

Depth In Feet	Sample Type & No.	N-Blows Per Foot	Graphic Symbol	LEGEND		
				S Shelby Tube	NX Diamond Core	P Penetration Test
			Core	Standard Penetration	J-Jar	
			Static Water Table	Hydrostatic Water Table	No Recovery	
VISUAL DESCRIPTION OF STRATUM						
0				5.0 INCHES OF TOPSOIL		
	P1	6		MEDIUM STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 TSF		
	P2	6		LOOSE MOIST BROWN SILTY SAND (SM)		
5	P3	12		MEDIUM DENSE MOIST BROWN SILTY SAND (SM)		
				BOTTOM OF HOLE AT 6.5 FEET IN SILTY SAND (SM). BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.		
10						

**LOG OF BORING**

PROJECT: PROPOSED TRUMANN FIRE STATION  
TRUMANN, ARKANSAS  
FOR: MILLER, NEWELL ENGINEERS

BORING NO: P2  
LOCATION: SEE PLAN OF BORINGS

DATE: 11/05/98 JOB NO.: 6622

BORING TYPE: AUGER W/SPT

DRILLER: STONE  
SIMCO 2400

GEOTECHNICIAN: ROACH

GROUND ELEVATION: NOT FURNISHED

0				5.0 INCHES OF TOPSOIL		
	P1	7		MEDIUM STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 TSF		
	P2	6		MEDIUM STIFF MOIST BROWN SANDY CLAY (CL) PP = 0.75 TSF		
5	P3	11		STIFF MOIST BROWN SANDY CLAY (CL) PP = 1.00 KSF		
				BOTTOM OF HOLE AT 6.5 FEET IN CLAY (CL). BORING REMAINED OPEN. NO WATER WAS ENCOUNTERED IN THIS BORING.		
10						



**FIELD CLASSIFICATION SYSTEM  
FOR SOIL EXPLORATION**

**NON COHESIVE SOILS**

(Silt, Sand, Gravel and Combinations)

**Density**

Very Loose	- 5 blows/ft. or less
Loose	- 6 to 10 blows/ft.
Medium Dense	- 11 to 30 blows/ft.
Dense	- 31 to 50 blows/ft.
Very Dense	- 51 blows/ft. or more

**Particle Size Identification**

Boulders	- 8-inch diameter or more
Cobbles	- 3 to 8-inch diameter
Gravel	- Coarse - 1 to 3-inch
	Medium - ½ to 1-inch
	Fine - ¼ to ½-inch
Sand	- Coarse - 0.6 mm to ¼-inch (dia. of pencil lead)
	Medium - 0.2 mm to 0.6 mm (dia. of broom straw)
	Fine - 0.05 mm to 0.2 mm (dia. of human hair)
Silt	- 0.06 mm to 0.002 mm (Cannot see particles)

**Relative Proportions**

Descriptive Term	Percent
Trace	1 - 10
Little	11 - 20
Some	21 - 35
And	36 - 50

**COHESIVE SOILS**

(Clay, Silt and Combinations)

**Consistency**

Very Soft	- 3 blows/ft. or less
Soft	- 4 to 5 blows/ft.
Medium Stiff	- 6 to 10 blows/ft.
Stiff	- 11 to 15 blows/ft.
Very Stiff	- 16 to 30 blows/ft.
Hard	- 31 blows/ft. or more

**Plasticity**

Degree of Plasticity	Plasticity Index
None to slight	0 - 4
Slight 5 - 7	
Medium 8 - 22	
High to Very High	over 22

**NOTES**

**Classification** on logs are made by visual inspection.

**Standard Penetration Test** - Driving a 2.0-inch O.D., 1½-inch I.D., sampler a distance of 1.0 foot into undisturbed soil with a 140-pound hammer free falling a distance of 30.0 inches. It is customary for AECI to drive the spoon 6.0 inches to seat into undisturbed soil, then perform the test. The number of hammer blows for seating the spoon and making the tests are recorded for each 6.0 inches of penetration on the drill log (Example: 6/8/9). The standard penetration test results can be obtained by adding the last two figures (i.e., 8 + 9 = 17 blows/ft.).

**Strata Changes** - In the column "Soil Descriptions" on the drill log the horizontal lines represent strata changes. A solid line (-----) represents an actually observed change, a dashed line (- - -) represents an estimated change.

**Groundwater** observations were made at the times indicated. Porosity of soil strata, weather conditions, site topography, etc., may cause changes in the water levels indicated on the logs.

KEY TO SOIL CLASSIFICATIONS AND SYMBOLS

UNIFIED SOIL CLASSIFICATION SYSTEM <sup>1,2</sup>					TERMS CHARACTERIZING SOIL STRUCTURE <sup>2</sup>	
Major Divisions	Letter	Symbol		Name		
		Matching	Color			
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW		RED	Well-graded gravels or gravel-sand mixtures, little or no fines	SLICKENSIDED - having inclined planes of weakness that are slick and glossy in appearance
		GP		RED	Poorly-graded gravels or gravel-sand mixtures, little or no fines	FISSURED - containing shrinkage cracks, frequently filled with fine sand or silt; usually more or less vertical.
		GM		YELLOW	Silty gravels, gravel-sand-silt mixtures	LAMINATED (VARVED) - composed of thin layers of varying color and texture, usually grading from sand or silt at the bottom to clay at the top.
		GC		YELLOW	Clayey gravels, gravel-sand-clay mixtures	CRUMBLY - cohesive soils which break into small blocks or crumbs on drying.
	SAND AND SANDY SOILS	SW		RED	Well-graded sands or gravelly sands, little or no fines	CALCAREOUS - containing appreciable quantities of calcium carbonate, generally nodular.
		SP		RED	Poorly-graded sands or gravelly sands, little or no fines	WELL GRADED - having wide range in grain sizes and substantial amounts of all intermediate particle sizes.
		SM		YELLOW	Silty sands, sand-silt mixtures	POORLY GRADED - predominantly of one grain size (uniformly graded) or having a range of sizes with some intermediate size missing (gap or skip graded).
		SC		YELLOW	Clayey sands, sand-clay mixtures	
FINE GRAINED SOILS	SILTS AND CLAYS LL < 50	ML		GREEN	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
		CL			Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
		OL			Organic silts and organic silt-clays of low plasticity	
	SILTS AND CLAYS LL > 50	MH		BLUE	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
		CH			Inorganic clays of high plasticity, fat clays	
		OH			Organic clays of medium to high plasticity, organic silts	
HIGHLY ORGANIC SOILS	PI		ORANGE	Peat and other highly organic soils		

- SYMBOLS FOR TEST DATA**
- M/C-15 - Natural moisture content in percent.
  - $\gamma_{95}$  - Dry unit weight in lbs/cuft.
  - Qu=1.23 - Unconfined compression strength in tons/sq ft.
  - Qc=1.66 (21 psi) - Confined compression strength at indicated lateral pressure.
  - SI-21-30 - Liquid limit, Plastic limit, and Plasticity Index.
  - 30% FINER - Percent finer than No. 200 mesh sieve.
  - 30 S/F - Blows per foot, standard penetration test.
  - ▽ - Ground water table.

TERMS DESCRIBING CONSISTENCY OF SOIL(S)

DESCRIPTIVE TERM	COARSE GRAINED SOILS		FINE GRAINED SOILS	
	NO. BLOWS/FT. STANDARD PEN. TEST	DESCRIPTIVE TERM	NO. BLOWS/FT. STANDARD PEN. TEST	UNCONFINED COMPRESSION TONS PER SQ. FT.
Very loose	0-4	Very Soft	< 2	< 0.25
Loose	4-10	Soft	2-4	0.25-0.50
Firm (medium)	10-30	Plastic (med. stiff)	4-8	0.50-1.00
Dense	30-50	Stiff	8-15	1.00-2.00
Very Dense	over 50	Very Stiff	15-30	2.00-4.00
		Hard	over 30	over 4.00

Field classification for "Consistency" is determined with a 0.25" diam. penetrometer.

1-From Waterways Experiment Station Technical Memorandum No. 3-387  
2-From "Soil Mechanics in Engineering Practice" by Terzaghi and Peck

## UNIFIED SOILS CLASSIFICATION SYSTEM (ASTM D-2487)

Major divisions	Group symbols	Typical names	Laboratory classification criteria		
<p style="text-align: center;">Gravels (More than half of coarse fraction is larger than No. 4 sieve size)</p> <p style="text-align: center;">Coarse-grained soils (More than half of material is larger than No. 200 sieve size)</p>	GW	Well-graded gravel, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3  Not meeting all gradation requirements for GW		
	GP	Poorly graded gravel, gravel-sand mixtures, little or no fines			
	Gravels with fines (Appreciable amount of fines)	GM <sup>o</sup>	d u	Determine percentages of sand and gravel from gradation curves. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than 5 per cent . . . . . GW, GP, SW, SP More than 5 per cent . . . . . GM, GC, SM, SC Borderline cases requiring dual symbols <sup>o</sup>	
		GC	Clayey gravels, gravel-sand-clay mixtures		
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3  Not meeting all gradation requirements for SW	
		SP	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (Appreciable amount of fines)	SM <sup>o</sup>	d u	Afterburg limits below "A" line or P.I. less than 4  Above "A" line with P.I. between 4 and 7 are borderline cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	
	<p style="text-align: center;">Silt and clays (Liquid limit less than 50)</p> <p style="text-align: center;">Fine-grained soils (More than half of material is smaller than No. 200 sieve)</p>	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity	<p style="text-align: center;">Plasticity Chart</p>	
		CL	Inorganic clays of low to medium plasticity, gravelly clays, silty clays, loam clays		
OL		Organic silts and organic silty clays of low plasticity			
MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
CH		Inorganic clays of high plasticity, fat clays			
OH		Organic clays of medium to high plasticity, organic silts			
Pt		Peat and other highly organic soils			

<sup>o</sup> Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Afterburg limits.  
<sup>1</sup> The U used when L.L. is 25 or less and the P.I. is 8 or less; the u is used when L.L. is greater than 25.  
<sup>2</sup> Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols.  
 For example GW-GC, well-graded gravel-sand mixture with clay binder.

Design Calculations for Conventional Footings

PROJECT: PROPOSED FIRE STATION

PROJECT NO.: 6620

DATE: 11/17/98

BORING NO.: AVG N

TESTED BY: AETC

SAFETY FACTOR: 2.00

Df ft	DEPTH - ft from to		STRATA H - ft	N B/F	Qu KSF	Qu/2 KSF	1.25Qu KSF	.125Df KSF	Qa KSF
1.5	0.0	1.5	1.5	7	1.9	0.9	2.3	0.188	1.3
4.0	1.5	4.0	2.5	7	1.9	0.9	2.3	0.500	1.4
6.5	4.0	6.5	2.5	13	3.4	1.7	4.3	0.813	2.6
9.0	6.5	9.0	2.5	13	3.4	1.7	4.3	1.125	2.7
11.5	9.0	11.5	2.5	10	2.7	1.3	3.3	1.438	2.3
16.5	11.5	16.5	5.0	3	0.8	0.4	1.0	2.063	1.3

WATER TABLE LEVEL: 8 ft.

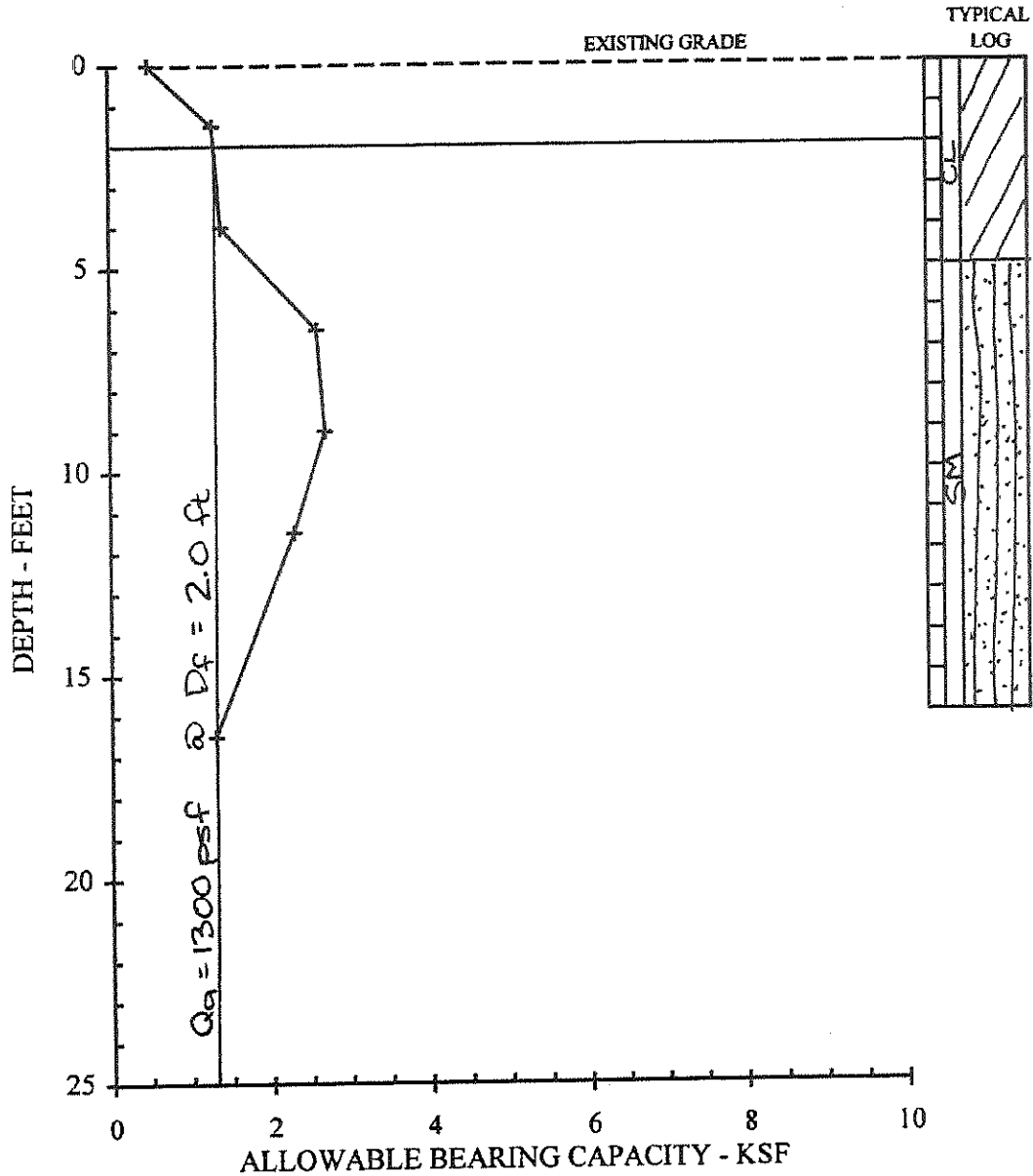
# CONVENTIONAL FOOTINGS

PROJECT: Proposed Fire Station  
Truman, Arkansas

BORING NO.: AVG N

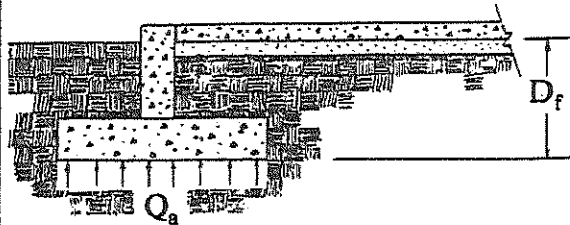
PROJECT NO.: 6620 WATER TABLE: 8.0 Feet

SAFETY FACTOR: 2.0

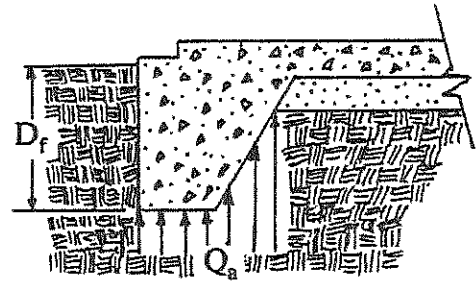


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### CONVENTIONAL FOOTINGS



### MONOLITHIC SLAB



### EXPLANATION OF CALCULATIONS SHOWN IN TABLES

$D_f$  = depth from ground surface to bottom of footing, ft.

Depth = depth from top to bottom of soil strata, ft.

Strata H = thickness of soil strata, ft.

N = standard penetration N-value, blows/ft.

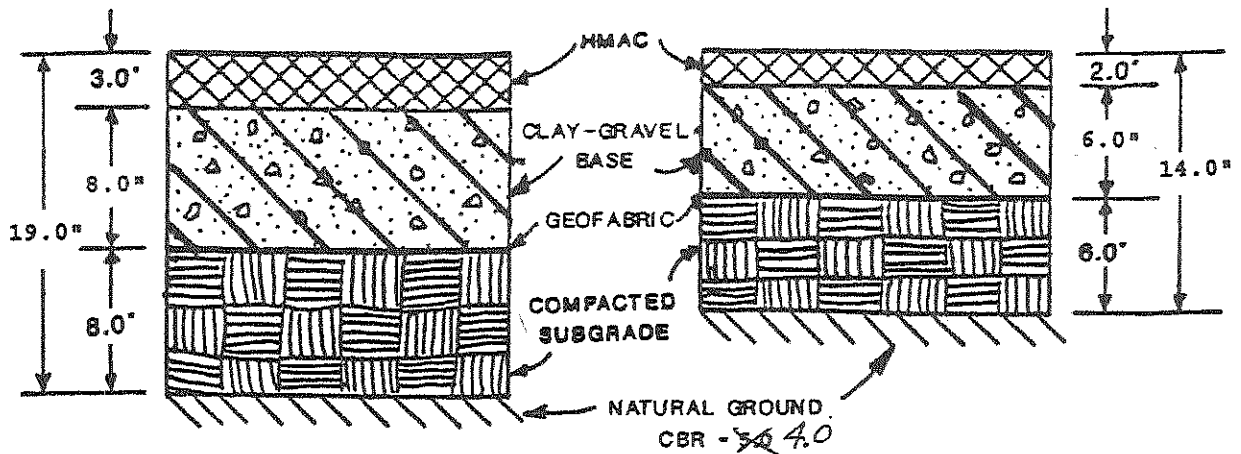
$Q_u$  = ultimate soil strength, ksf

$1.25 Q_u$  = soil strength parameter, ksf

$0.125 D_f$  = depth factor, ksf

$Q_a$  = allowable bearing capacity =  $(1.25 Q_u + 0.125 D_f) \div S.F.$ , ksf

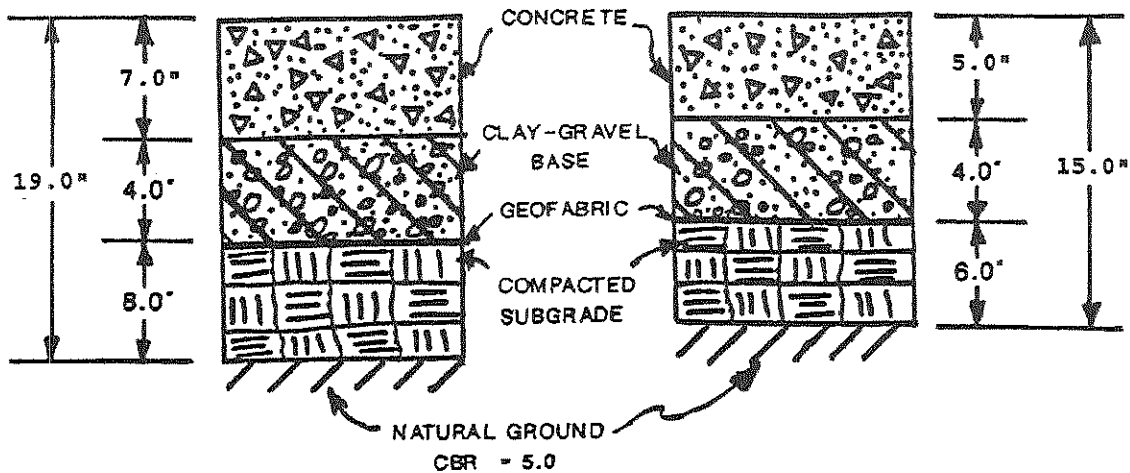
### **EXPLANATION OF BEARING CAPACITY CALCULATIONS**



HEAVY TRAFFIC

LIGHT TRAFFIC

RECOMMENDED FLEXIBLE PAVEMENT STRUCTURE



HEAVY TRAFFIC

LIGHT TRAFFIC

RECOMMENDED RIGID PAVEMENT STRUCTURE





SECTION 02050

SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SELECTION INCLUDES

- A. This Section includes selective demolition, including but not limited to:
  - 1. Demolition and removal of slabs and other existing elements as required to execute the work.
- B. Related Sections include the following:
  - 1. Division 1 Section "Temporary Construction Facilities and Controls" for temporary construction, protection facilities, and environmental-protection measures for demolition operations.
  - 2. Refer to Drawing for demolition and relocation of mechanical and electrical items.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition.
- B. Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 ITEMS

- A. Items to be Removed: Except for items identified to be salvaged for the Owner or reused for this project, remove items from the site and legally dispose offsite.
- B. Items Salvaged for Owner: Pack, label, and store as directed by Owner.
- C. Items Reused for this Project: Store and protect removed items that will be reused.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of demolition required.
- B. Review of Project Record Documents of existing construction provided by Owner does not guarantee that existing conditions are the same as those indicated in Project Record Documents.
- C. When unanticipated mechanical, electrical, or structural elements are encountered, investigate, and measure the nature and extent of the element. Promptly submit a written report to Architect.

3.02 PREPARATION

- A. Existing Utilities
  - 1. Arrange to shut off indicated utilities with utility companies.

### 3.03 PROTECTION

- A. Existing Facilities: Protect site elements, including slabs and sidewalks, that are to remain.
- B. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Division 1 Section "Temporary Facilities and Controls."
  - 1. Protect existing site improvements, appurtenances, and landscaping to remain.
  - 2. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 3. Provide protection to ensure safe passage of people around demolition area.

### 3.04 DEMOLITION, GENERAL

- A. General: Demolish indicated existing items and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  - 2. Maintain adequate ventilation when using cutting torches.
  - 3. Locate demolition equipment and remove debris and materials so as not to impose excessive loads on remaining work.
  - 4. The contractor shall furnish all labor and materials required to complete demolition.
  - 5. All work demolished shall be removed from the site daily, except items to be reused or returned to the owner.
  - 6. Patched or repaired areas shall be returned to "like new" condition prior to installing proposed work.
- B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
  - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

### 3.05 EXPLOSIVE DEMOLITION

- A. Explosives: Use of explosives is not permitted.

### 3.06 SITE RESTORATION

- A. Site Grading: Repair all damage to the site due to the demolition, including, but not limited to: grade, grass, concrete walks and drives.

### 3.07 REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by demolition operations.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

### 3.08 RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
  - 1. Provide containers or other storage method approved by Architect for controlling recyclable materials until they are removed from Project site.
  - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  - 3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
  - 4. Store components off the ground and protect from the weather.
  - 5. Transport recyclable materials off Owner's property and legally dispose of them.

### 3.09 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them offsite.
- B. Do not allow demolished materials to accumulate on-site.
- C. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

### 3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing before demolition operations began.

END OF SECTION



SECTION 03300  
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Concrete formwork.
- B. Floors and slabs on grade.
- C. Concrete foundation walls.
- D. Concrete reinforcement.
- E. Underslab Vapor Retarder.
- F. Concrete curing.

1.02 REFERENCE STANDARDS

- A. ACI 301 – Specifications for Structural Concrete for Buildings; American Concrete Institute International; 2005.
- B. ACI 302.1R – Guide for Concrete Floor and Slab Construction; American Concrete Institute International; 2004 (errata 2007).
- C. ACI 304R – Guide for Measuring, Mixing, Transporting, and Placing Concrete; American Concrete Institute International; 2000.
- D. ACI 305R – Hot Weather Concreting; American Concrete Institute International; 1999.
- E. ACI 306R – Cold Weather Concreting; American Concrete Institute International; 1988 (Reapproved 2002).
- F. ACI 308R – Guide to Curing Concrete; American Concrete Institute International; 2001 (Reapproved 2008).
- G. ACI 318 – Building Code Requirements for Structural Concrete and Commentary; American Concrete Institute International; 2008.
- H. ASTM A 615/A 615M – Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement; 2007.
- I. ASTM C 39/C 39M – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2005.
- J. ASTM C 94/C 94M – Standard Specification for Ready-Mixed Concrete; 2007.
- K. ASTM C 143/C 143M – Standard Test Method for Slump of Hydraulic-Cement Concrete; 2008.
- L. ASTM C 171 – Standard Specification for Sheet Materials for Curing Concrete; 2007.
- M. ASTM C 1107/C 1107M – Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2008.

- N. ASTM E 1745 – Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2009.

### 1.03 SUBMITTALS

- A. See administrative requirements given by the architect, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.
- C. Samples: Submit samples of underslab vapor retarder to be used.
- D. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

### 1.04 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.

## PART 2 - PRODUCTS

### 2.01 FORMWORK

- A. Forms For Exposed Finish Concrete: Plywood, metal, metal-framed plywood faced, or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces.
- B. Forms For Unexposed Finish Concrete: Use plywood, lumber, metal, or other acceptable material. If lumber is used, it must be dressed on at least 2 edges and 2 sides for a tight fit.
- C. Form Coatings: Commercial formulation form coating compound with maximum VOC of 350 mg/l that will not bond with, stain, nor adversely affect concrete surfaces, will not impair subsequent treatments of concrete surfaces.
- D. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units that will leave no metal closer than 1-1/2" to exposed surface.
  - 1. Provide ties that, when removed, will leave holes not larger than 1" diameter in concrete surface.

### 2.02 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
  - 1. Type: Deformed billet-steel bars.
  - 2. Finish: Unfinished, unless otherwise indicated.
- B. Reinforcement Accessories:
  - 1. Tie Wire: Annealed, minimum 16 gage.
  - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

3. Provide galvanized components for placement within 1-1/2 inches of weathering surfaces.

## 2.03 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E 1745, Class A; .012 Perms or less, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.
  1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
  2. Construct pipe boots from vapor barrier material, pressure sensitive tape and/or mastic per manufacturer's instructions.
  3. This specification shall not be used if the architect also specifies the underslab vapor retarder.
- B. Non-shrink Grout: ASTM C 1107/C 1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
- C. Moisture-Retaining Cover: ASTM C 171; regular curing paper, white curing paper, clear polyethylene, or white burlap-polyethylene sheet.

## 2.04 MIXING

- A. Transmit Mixers: Comply with ASTM C 94/C 94M.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

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

### 3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Verify that forms are clean and free of rust before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade and under and up sides of grade beams and footings. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.

### 3.03 INSTALLING REINFORCEMENT

- A. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.

### 3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.

- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify architect not less than 24 hours prior to commencement of placement operations for inspections.
- D. Ensure reinforcement, inserts, water stops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- E. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with joint filler.
- G. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface. Conform to Section 07900 for finish joint sealer requirements.
- I. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- J. Place concrete continuously between predetermined expansion, control, and construction joints.
- K. Do not interrupt successive placement; do not permit cold joints to occur.
- L. Saw cut joints within 24 hours after placing. Use 3/16-inch-thick blade, cut into 1/4 depth of slab thickness.
- M. Scream floors level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

### 3.05 CONCRETE FINISHING

- A. Repair surface defects, including tie holds, immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/8 inch or more in height. Provide finish as follows:
  - 1. Grout Cleaned Finish: Finish to requirements of ACI 301. Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
  - 1. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.
  - 2. Other Surfaces to Be Left Exposed: "Steel trowel" as described in ACI 302.1R, minimizing burnish marks and other appearance defects.

### 3.06 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
  - 1. Normal concrete: Not less than 7 days.



C. Surfaces Not in Contact with Forms:

1. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Wet surface and cover with plastic sheeting secured in place. Keep covered and moist for five days.
2. Final Curing: Begin after initial curing but before surface is dry.
  - a. Moisture-Retaining Cover: Seal in place with waterproof tape or adhesive.

3.07 FIELD QUALITY CONTROL

- A. An independent testing agency will perform quality control tests.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 50 cu yd or less of each class of concrete placed.
- F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.

3.08 DEFECTIVE CONCRETE

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

END OF SECTION



SECTION 04100

MORTAR AND MASONRY GROUT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes furnishing materials, mixing and application of mortar and masonry grout for masonry work required for the construction of the masonry walls and partitions and masonry veneer.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Requirements for aggregate sizes for grout.
- B. Section 04150 - Masonry Accessories and Reinforcement: Coordination of the placement/embedment of the masonry accessories and reinforcement with the placement of the mortar and grout.
- C. Section 04200 - Reinforced Unit Masonry: Mortar and grout for erection of the concrete unit masonry.
- D. Section 04210 - Brick Masonry: Mortar for erection of the brick masonry.

1.03 QUALITY ASSURANCE

- A. Mix Design
  1. Proposed mix designs shall be submitted to testing agency for approval prior to commencement of work.
  2. Tests of proposed mixes will be performed to ensure conformance with requirements stated herein.
  3. Where mortar and grout mixes do not conform with requirements stated herein, Contractor must re-submit for further testing, and pay all costs for required retesting.
- B. Referenced Standards - Mortar and grout (materials, manufacture and installation) shall comply with the following standards:
  1. ASTM C 150 - Portland Cement
  2. ASTM C 595 - Specifications for Blended Hydraulic Cements
  3. ASTM C 260 - Specifications for Air Entraining Admixtures for Concrete
  4. ASTM C 91 - Masonry Cement
  5. ASTM C 5 - Quicklime for Structural Purposes
  6. ASTM C 207 - Hydrated Lime for Masonry Purposes
  7. ASTM C 144 - Aggregate for Masonry Mortar
  8. ASTM C 387 - Packaged, Dry, Combined Materials for Mortar and Concrete
  9. ASTM C 476 - Grout for Masonry
  10. ASTM C 270 - Mortar for Unit Masonry
  11. ASTM C 404 - Aggregates for Masonry Grout
  12. ASTM E 447 - Methods for Compression Strength of Masonry Prisms
- C. Copies of ASTM C 270 and ASTM C 476 shall be kept on the project site for ready reference.

1.04 SUBMITTALS

- A. Submit copies of technical data describing materials to be used for review in accordance with Section 01340.

## PART 2 - PRODUCTS

### 2.01 MORTAR MATERIALS - Conform to ASTM C 270 as specified herein.

- A. Mortar materials shall consist of the following:
  - 1. Portland Cement: ASTM C 150, normal-type, white in color as required by project conditions. The free alkali content shall be 0.05 percent or less.
  - 2. Masonry cement: ASTM C 91, for general and high strength uses. The free alkali content shall be 0.50 percent or less.
  - 3. Aggregates (sand): ASTM C 144 standard masonry type clean, dry and protected against dampness, freezing and foreign matter.
  - 4. Hydrated lime: ASTM C 207, Type S
  - 5. Quicklime: ASTM C 5, non-hydraulic type.
  - 6. Premixed mortar: ASTM C 387 commercially prepared type, mortar types M or S, using white cement, as required by project conditions.
  - 7. Water: Shall be potable.
- B. Admixtures
  - 1. Mortar Color
    - a. Gray for Concrete Masonry Units.
    - b. Colored mortar for brick masonry: Provide pre-blended mortar mix for all brick masonry. Colored mortar shall be SPEC MIX or other manufacturer as accepted or required by Architect.
  - 2. Plasticizers, accelerators, retardants, water repellent agents, or other admixtures shall not be used in mortar mixes unless otherwise stated in Paragraph C below, or specifically required by project conditions, and then only with approval of the Architect.
  - 3. Under no circumstances will calcium chloride be added to any mortar.
- C. Mortar Mixes shall conform to ASTM C 270, using either the Property or Proportion Specifications:
  - 1. As required by project conditions, mixes may consist of any of following combinations:
    - a. Portland cement, lime and fine aggregate
    - b. Masonry cement and fine aggregate
    - c. Portland cement, masonry cement and fine aggregate
    - d. Commercially prepared premix mortar and fine aggregate
  - 2. Provide Type M minimum 2,500 psi mortar for masonry walls constructed below grade and for construction of site drainage structures.
  - 3. Provide Type S minimum 1,800 psi mortar for load-bearing and non-load-bearing unit masonry walls and partitions and brick masonry.
  - 4. Type N mortar shall not be allowed for any masonry work.

### 2.02 GROUT MATERIALS

- A. Grout shall consist of a 3,000 psi concrete conforming to Section 03300, Cast-In-Place Concrete, using pea gravel for the coarse aggregate.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Measurement of materials shall be such that the specified proportions are controlled and accurately maintained. Workability or consistency of mortar on the board shall be such that the mortar is sufficiently wet to be worked under the trowel. Mortar which has begun to "set" or is not used within two and one-half (2.5) hours after initial mixing shall be discarded. Mortar which has stiffened due to evaporation within the two and one-half (2.5) hour period shall be retempered to restore its workability.

### 3.02 MIXING AND PLACING

- A. Mortar and grout ingredients shall be thoroughly mixed, in quantities needed for immediate use.
- B. For colored mortar, a sample from each lot number shall be mixed and installed in a sample panel to evaluate against the selected color. Care shall be exercised to ensure uniformity of mixes and coloration.
- C. Mortar shall be machine mixed in approved type mixer in which quantity of water can be accurately and uniformly controlled. Mixing time shall be not less than 5 minutes, approximately 2 minutes of which shall be for mixing dry materials and not less than 3 minutes continuing mixing after water has been added.
- D. For work requiring only small batches of mortar or grout and when specifically approved by the Architect, mortar may be mixed by hand in watertight mortar mixing boxes. Materials of each batch shall be well raked and turned over together before water is added, until mix is an even color throughout mass after which water shall be gradually added until a thoroughly mixed mortar of required plasticity is obtained.
- E. Pointing mortar shall be as dry as consistency as will produce mortar sufficiently plastic to be worked into joints.
- F. All mixing boxes and equipment shall be kept clean. Mortar and grout shall be prepared in batches or volumes that will be used before initial set takes place, and in no case longer than 45 minutes before delivery to point of use. Mortar must be used within 2 hours of mixing at temperatures over 80 degrees Fahrenheit, and 2-1/2 hours at temperatures under 50 degrees Fahrenheit. Retempering after initial set will not be permitted.

END OF SECTION



## SECTION 04150

### MASONRY ACCESSORIES AND REINFORCEMENT

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes furnishing materials and installation of the masonry accessories and reinforcement required for the construction of the masonry walls and partitions and masonry veneer.

##### 1.02 RELATED SECTIONS

- A. Section 04100 - Mortar and Masonry Grout: Coordination of placement of reinforcing with installation of mortar and grout.
- B. Section 04200 - Reinforced Unit Masonry: Reinforcing and anchorages for concrete unit masonry. Wall ties for securing the brick masonry to masonry backup.
- C. Section 04210 - Brick Masonry: Ties and anchorages for the brick masonry.
- D. Section 05400 - Cold Formed Metal Framing: Metal framing for securing of wall ties.

##### 1.03 SUBMITTALS

- A. Submit the following to the Architect for review:
  - 1. Copies of technical data describing the herein specified materials.
  - 2. Shop Drawings for fabrication, bending and placement of reinforcement bars. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures". Show bar schedules, diagrams of bent bars, stirrup spacing, lateral ties and other arrangements and assemblies as required for fabrication and placement of reinforcement for unit masonry system.
  - 3. Shop drawings shall include wall elevations on all load-bearing walls showing placement of all reinforcement and shall indicate size, length, spacing, laps and hooks (field and otherwise). Wall elevations shall show all openings greater than 8"x8" with placement of reinforcement around openings indicated to show size, length and laps as required.

##### 1.04 REFERENCE STANDARDS

- A. The following shall be complied with in the materials used, fabrication and placement of the reinforcing steel specified herein:
  - 1. ASTM A 82 - Cold Drawn Steel Wire for Concrete Reinforcement.
  - 2. ASTM A 153 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - 3. ASTM A 615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Steel reinforcing bars for reinforced masonry, lintel blocks and bond beams and other as shown on the Drawings or otherwise specified, shall be deformed steel bars (conforming to Cast-In-Place Concrete reinforcement in Section 03300) sized as shown on the drawings and in lengths sufficient to run complete length as indicated on the Drawings.

- B. Joint reinforcing for concrete masonry units and brick masonry: Provide truss type joint reinforcing units prefabricated in straight lengths of not less than 10', with matching corner ("L") and intersecting ("T") units. Fabricate from cold-drawn steel wire complying with ASTM A 82 (tensile strength of 80,000 and a yield strength of 70,000 psi), with single pair of deformed continuous side rods and plain cross rods, into units with widths approximately 2" less than nominal width of walls and partitions as required to position side rods for full embedment in mortar with mortar coverage as specified herein. Provide mill finished galvanized 0.10 ounce for interior walls and hot-dipped galvanized for exterior walls, complying with ASTM A 641, Class 3. All joint reinforcement shall comply with seismic requirements for the project.
- C. Where brick masonry is backed up with cold-formed metal framing, provide Hohmann & Barnard #DW-10 Anchor with Byna-Lok Wire Tie, Seismic Clip and Continuous Wire.
- D. Fabricate devices and reinforcement which extend into masonry from steel with hot-dipped G-90 (1.25 oz.) galvanized coating.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Provide continuous horizontal joint reinforcing in concrete unit masonry foundation walls and other areas shown. Fully embed longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls and 1/2" at other locations. Lap reinforcement a minimum of 6". Do not bridge control and expansion joints with reinforcing, unless otherwise indicated. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed by the manufacturer for continuity at returns, offsets, pipe enclosures and other special conditions.
- B. All openings in masonry walls resting on footings shall be reinforced with a minimum of one (1) #5 bar at top, bottom and both sides in grouted cells. Continue reinforcing 24" minimum beyond edges of opening.
- C. All joint reinforcement shall be placed at 16" o.c. vertical in concrete unit masonry walls.
- D. Brick masonry shall be anchored to backup at maximum distances of 16" centers horizontally and 16" centers vertically.

END OF SECTION



SECTION 04200

REINFORCED UNIT MASONRY

PART 1 - PRODUCTS

1.01 SUMMARY: Unit masonry assemblies, complete. Work includes:

- A. Concrete masonry units.
- B. Mortar and grout.
- C. Ties and anchors.
- D. Miscellaneous masonry accessories.
- E. Installation of stone veneer at cavity and composite walls, and concrete.

1.02 SUBMITTALS:

- A. See administrative requirements given by the architect, for submittal procedures.
- B. Product Data: Submit manufacturer's technical data and installation instructions for insulation material.
- C. Shop Drawings: Submit expansion and control joint layout.
- D. Samples: Submit samples of brick units proposed for use for verification and approval.

1.03 QUALITY ASSURANCE:

- A. Codes and Standards: Provide material and work complying with referenced codes, regulations, and standards.
- B. Manufacturer: Obtain each type of unit from one manufacturer, cured by one process, and of uniform texture and color.
- C. Fire-Rated Masonry: Wherever a fire-resistance classification is indicated or scheduled, comply with applicable requirements for materials and installation established by governing authorities.
- D. Field Construction Mock-Ups: Prior to installation of masonry work, erect sample wall panels to verify selections made for color and textural characteristics, under sample submittals of masonry units and mortar, and to represent completed masonry work for qualities of appearance, materials, and construction; build mock-ups to comply with the following requirements:
  - 1. Locate mock-ups as directed.
  - 2. Build mock-ups for each type of exposed unit masonry work, in sizes of approximately 6' long by 6' high by full thickness, including face and back-up wythes as well as accessories.
  - 3. Obtain acceptance of visual qualities of mock-up before start of masonry work. Retain mock-up and use as quality standard until work is completed. When directed, demolish mock-ups, and remove from site.
  - 4. Use sample panels to test proposed cleaning procedures.
  - 5. Use sample panels to test water repellent coating.

1.04 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials to project in undamaged condition.
- B. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes.
- C. Store cementitious materials off ground, under cover and in dry location.

- D. Store aggregates when grading and other required characteristics can be maintained.
- E. Store masonry accessories including metal items to prevent deterioration by corrosion and accumulation of dirt.

#### 1.05 PROJECT CONDITIONS:

- A. Protect masonry materials during storage and construction from wetting by rain, snow, or ground water and from soilage or intermixture with earth or other materials. Do not use metal reinforcing or ties having loose rust or other coatings, including ice, which will reduce or destroy bond.
- B. During erection, cover top of wall with heavy waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
- C. Do not apply uniform floor or roof loading for at least 12 hours after building masonry walls or columns. Do not apply concentrated loads for at least 3 days after building masonry walls or columns.
- D. Prevent grout or mortar from staining the face of masonry to be left exposed or painted. Immediately remove grout or mortar in contact with masonry. Protect sills, ledges, and projections from droppings of mortar.
- E. Do not lay masonry when the temperature of outside air is below 40°F unless means are provided to heat and maintain temperature of masonry materials and protect completed work from freezing. Protection shall consist of heating and maintaining temperature of masonry materials to at least 40°F and maintaining an air temperature above 40°F on both sides of masonry at least 48 hours.

## PART 2 - PRODUCTS

### 2.01 CONCRETE MASONRY UNITS:

- A. General:
  - 1. Comply with referenced standards and other specified requirements for each type of masonry unit required.
  - 2. Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding, cap, cove, and other special conditions.
- B. Concrete Block: Provide units complying with characteristics specified below for grade, type, face size, exposed face, and weight classifications.
  - 1. Hollow Loadbearing Block: ASTM C 90; lightweight, except use normal weight block for work below grade.
  - 2. Size: Manufacturer's standard units with nominal face dimensions of 16" long X 8" high X thicknesses indicated.
  - 3. Type I, moisture-controlled units; cure units to meet specified requirements, including average dry shrinkage of 0.03% when tested in compliance with ASTM C 426.
  - 4. Exposed Faces: Manufacturer's standard color and texture.
  - 5. Fire-Rated Units: Approved for fire rating indicated.

### 2.02 MORTAR AND GROUT MATERIALS:

- A. See Structural Drawings.

### 2.03 MASONRY ACCESSORIES: Hohmann & Barnard is specified. Equivalent products from Dur-O-Wal and AA Wire Products are acceptable or approved equal.

- A. Continuous Masonry Wire Reinforcing:

1. Provide welded wire units prefabricated in straight lengths of not less than 10', with matching corner and tee units. Fabricate from cold-drawn steel wire complying with ASTM A82, with deformed continuous side rods and plain cross rods, and a unit width of 1 1/2" to 2" less than thickness of wall or partition. Provide manufacturer's standard hot dipped galvanized finish.
2. Use truss type fabricated with single pair of 9 gage side rods, and 9 gage continuous diagonal cross rods spaced not more than 16" o.c. above grade and 8" o.c. below grade.

B. Wall Ties And Anchors:

1. At Concrete: 1" wide X 1" deep X 3/4" throat, 24 gage hot dipped galvanized dovetail anchor slot, and dovetail triangle with 1/4" wire and 12 gage hot dipped galvanized dovetail.
2. At Metal Framing: Hohmann & Barnard X-Seal, hot dipped galvanized, 12 gage, with vee-tie, hot dipped galvanized, 1/4" diameter. Attach anchors to metal framing with #10 self-tapping corrosion-resistant screws.
3. At Steel: 9" long X 3/4" wide, 12 gage, flat continuous adjustable weld-on anchor, hot dipped galvanized, and 3/16" gage square nosed beam tie, hot dipped galvanized.
4. At Cavity/Composite Walls With Irregular Coursing: Double eye adjustable truss, with eye sections spaced 16" o.c., hot dipped galvanized; eye and pintle length as required by wall conditions.
5. At Intersecting Walls: 1/2" X 1/2" mesh, 16 gage hot-dipped galvanized wire mesh ties.

2.04 MASONRY CLEANER: Manufacturer's standard strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

A. Available Products: Subject to compliance with requirements, products that may be used to clean unit masonry surfaces, provide one of the following:

1. Cleaners Not Subject to Metallic Staining with Mortar Not Subject to Bleaching:
  - a. Diedrich Technologies, Inc. "202 New Masonry Detergent".
  - b. ProSoCo, Inc. "Sure Klean No. 600 Detergent".
  - c. Approved equal.
2. Cleaners Subject to Metallic Staining:
  - a. Diedrich Technologies, Inc. "202V Vana-Stop".
  - b. ProSoCo, Inc. "Sure Klean Vana Trol".
  - c. Approved equal.

2.05 MORTAR AND GROUT MIXTURES:

A. Mortar Mix: ASTM C 270, Type S; at exterior use integral waterproofing admixture.

1. Use white Portland, white aggregate and mortar pigment as required to produce mortar color selected by Architect
2. At exterior use integral waterproofing admixture.
3. Use mortar within 30 minutes of final mixing; do not retemper or use partially hardened material.

B. Grout Mix: ASTM C 476.

C. Measure and batch materials either by volume or weight, such that required proportions can be accurately controlled and maintained. Measurement of sand exclusively by shovel will not be permitted. Mix mortars with the maximum amount of water consistent with workability to provide maximum tensile bond strength within the capacity of mortar. Mix ingredients for a minimum of 5 minutes in a mechanical mixer. Do not use mortar or grout which has begun to set, or if more than 2 1/2 hours has elapsed since initial mixing. Retemper mortar during 2-1/2-hour period as required to restore workability. Do not add air-entraining agents or other admixtures to mortar or grout materials.

## PART 3 - EXECUTION

3.01 EXAMINATION: Examine the areas and conditions under which masonry is to be installed. Do not proceed with the work until unsatisfactory conditions have been corrected.

### 3.02 PREPARATION:

- A. Brick: Wet clay brick having ASTM C67 absorption rates greater than 0.025 oz. per sq. in./minute.
- B. CMU: Do not wet concrete masonry units.
- C. Cleaning Reinforcing: Before placing, remove loose rust, ice, and other coatings from reinforcing.

### 3.03 CONSTRUCTION TOLERANCES:

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20', nor 1/2" in 40' or more. For external corner, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story of 20' maximum, nor 1/2" in 40' or more.
- B. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 3/4" in 40' or more.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4" nor plus 1/2".

### 3.04 INSTALLATION, GENERAL:

- A. Thickness: Build cavity/composite wythe walls to full thickness shown. Build single wythe walls to actual thickness of masonry units, using units of nominal thickness indicated.
- B. Build chases and recesses as indicated and required for work of other trades. Provide not less than 8" of masonry between chases or recess and jamb openings, and between adjacent chases and recessed.
- C. Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.
- D. Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to fit adjoining work neatly. Use full-side units without cutting wherever possible.
- E. Keep cavities clean of mortar droppings and other materials during wall construction. Strike joints flush facing cavity.
- F. Provide weepholes in exterior wythes of walls located immediately above ledges and flashing, spaced 24" o.c., unless otherwise indicated.
- G. Insulation: Install insulation in strict accordance with manufacturer's recommendations.
- H. Flashing: Comply with the manufacturer's instructions for handling and installation of flashing to provide a complete membrane over area to be flashed. Seal projections through sheet and lap and seal seams.
- I. Coordinate work with work of other trades.

### 3.05 LAYING MASONRY WALLS:

- A. Lay walls plumb and true to comply with specified tolerances, with courses level, accurately spaced and coordinated with other work.
- B. Lay brick with completely filled bed, head and collar joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints. Lay in running bond with vertical joint in each course centered on units in course above and below, except where other coursing is indicated.
- C. Lay concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with grout. Lay CMU in running bond with vertical joint in each course centered on units above and below. Where indicated, fill cells with grout.
- D. Build-in items specified under this and other sections of this specification. Fill in solidly with masonry around built-in items. Fill space between hollow metal frames and masonry solidly with mortar.
- E. Joints: Lay walls with 3/8" joints. Use as dry a mortar mix as practicable and compress joints as much as possible to produce a dense tight joint.
  - 1. Concealed joints and joints to receive coatings: Strike flush.
  - 2. Exposed brick joints: Tooled.
  - 3. Exposed CMU joints: Tooled.

### 3.06 HORIZONTAL JOINT REINFORCING:

- A. Reinforce walls with continuous horizontal reinforcing. Fully embed longitudinal side rods in mortar for their entire length. Lap reinforcement a minimum of 6" at ends of units. Do not bridge control joints with reinforcing. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcing as directed by manufacturer for special conditions. Space reinforcing 16" o.c. vertically.
- B. Reinforce masonry openings greater than 12' wide with horizontal joint reinforcing placed in 2 horizontal joints approximately 8" apart, both immediately above the lintel and below the sill. Extend reinforcing a minimum of 2' beyond jambs of opening bridging control joints where provided.

### 3.07 ANCHORING MASONRY WORK:

- A. At Concrete: Anchor single wythe masonry veneer to concrete with specified dovetail anchors and triangles spaced 16" o.c. vertically and horizontally.
- B. At Metal Framing: Anchor single wythe masonry veneer to metal studs backup with specified anchors spaced 16" o.c. vertically and 16" o.c. horizontally.
- C. At Cavity/Composite Wall: Place double eye truss in wall spaced 16" o.c. vertically.
- D. At Steel: Place adjustable weld-on anchor attachment of beam tie at 16" o.c.
- E. At Intersecting Walls: Place wire mesh tie in intersecting walls every other course.

- 3.08 CONTROL AND EXPANSION JOINTS: Install vertical expansion control and isolation joints as indicated, at maximum 30' o.c. at long wall runs, and at large openings in wall. Build-in related items as masonry work progresses. Refer to Section 07900 for sealants.

3.09 REPAIR, POINTING AND CLEANING:

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of placement.
- B. Pointing: During the tooling of joints, enlarge and voids or holes, except weep holes, and completely fill with mortar. Point-up joints at corners, openings, and adjacent work to provide a neat, uniform appearance, properly prepared for application of caulking or sealant compounds.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
  - 1. Clean masonry with specified masonry cleaner applied according to manufacturer's written instructions.
  - 2. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain on exposed surfaces.

END OF SECTION

SECTION 04210

BRICK MASONRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes furnishing materials, labor and equipment for the installation of the brick masonry. Items required to be built in as the brick masonry work progresses shall be installed under this Section.
- B. Installed in conjunction with the work but specified in other Sections of this Specification are the following:
  - 1. Concrete unit masonry.
  - 2. Thru-wall flashing.
  - 3. Loose lintels, bearing plates, hangers, anchor bolts, sleeves, etc., which are anchored to bear on, or built into masonry.
  - 4. Hollow metal door frames.

1.02 RELATED SECTIONS

- A. Section 01020 - Allowances: Allowance for field brick and accent brick.
- B. Section 01451 - Mockup Panel Requirements
- C. Section 04100 - Mortar and Masonry Grout: Mortar and grout used in the erection of the brick masonry.
- D. Section 04150 - Masonry Accessories and Reinforcement: Wall ties for securing brick masonry.
- E. Section 04200 - Reinforced Unit Masonry: Concrete block installed as a component of the wall system.
- F. Section 05500 - Metal Fabrications: Items built into masonry.
- G. Section 07600 - Flashing and Sheet Metal: Thru-wall flashings installed in conjunction with the brick masonry.
- H. Section 07920 - Sealants and Caulking: Sealants installed in masonry expansion joints and control joints.
- I. Section 08100 - Hollow Metal Doors and Frames: Coordination of the erection of the hollow metal work with the erection of the brick masonry.
- J. Section 08640 - Aluminum Clad Windows and Doors: Coordination of the window installations with the erection of the brick masonry.
- K. Section 10201 - Building Louvers: Coordination of the louvers installations with the erection of the brick masonry.

1.03 QUALITY ASSURANCE

- A. Sample Panel: Prior to the erection of any brick masonry, erect where indicated by the Architect, an 6' x 6' sample wall. Panel face shall show mortar, bond, joint tooling, etc. The approved panel shall represent standards of workmanship for all work covered under this Section and shall remain intact until all masonry has been installed and approved. Coordinate location of panel with Architect. Provide for four mock-ups, one as required above, and three more at 4' x 4' for selection of brick color with various options of brick and mortar.

- B. Test brick in accordance with ASTM 67. Brick tested is to be from actual run of brick to be supplied for use on this project; test must indicate "NO EFFLORESCENCE" for the brick to be acceptable. Sample panel shall be approved by Architect prior to order of entire amount of brick for Project.

#### 1.04 SUBMITTALS

- A. Submit samples of brick masonry, including field brick, accent brick, and special brick shapes. Include the full range of exposed color and texture expected in the completed work.
- B. Certificates attesting compliance with the applicable Specifications for grades, types and classes.
- C. Copies of manufacturer's recommended brick cleaning agent and application procedure.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store brick off ground to prevent contamination by mud, dust or materials likely to cause staining or other defects.
- B. Cover materials as necessary to protect from elements.
- C. Protect anchors, ties, and reinforcements from elements.

#### 1.06 COLD WEATHER PROTECTION

- A. Preparation
  - 1. Remove ice or snow formed on masonry bed by carefully applying heat until top surface is dry to touch. Remove frozen or damaged masonry.
  - 2. Sprinkle with heated water when brick suction exceeds 30 gm./min./30 square in.
    - a. When units are above 32 degrees Fahrenheit, heat water above 70 degrees Fahrenheit.
    - b. When units are below 32 degrees Fahrenheit, heat water above 130 degrees Fahrenheit.
  - 3. Use only dry masonry units. Do not use frozen.
- B. Protection requirements while masonry units are being laid.
  - 1. Air temperature 25 degrees Fahrenheit to 20 degrees Fahrenheit.
    - a. Use salamanders or other heat sources on both sides of walls under construction.
    - b. Use wind breaks when wind is in excess of 15 mph.
  - 2. Air temperature 20 degrees Fahrenheit and below:
    - a. Provide enclosures and auxiliary heat to maintain air temperature above 32 degrees Fahrenheit.
    - b. Minimum temperature of units when laid shall not be less than 20 degrees Fahrenheit.
- C. Protection requirements for completed masonry and masonry not being worked on:
  - 1. Maintain daily air temperature 48 degrees Fahrenheit to 32 degrees Fahrenheit: Protect masonry from rain or snow for 24 hours by covering with non-staining, weather-resistant membrane.
  - 2. Maintain daily air temperature 32 degrees Fahrenheit to 25 degrees Fahrenheit: Completely cover masonry with either insulating blankets or equal protection for 48 hours.
  - 3. Maintain daily air temperature 25 degrees Fahrenheit to 20 degrees Fahrenheit: Maintain masonry temperature above blankets, infra-red lamps, or other acceptable methods.
  - 4. Cover top of walls with non-staining waterproof coverings at end of each day or shutdown.
  - 5. Cover partially completed walls with non-staining waterproof membrane when work is not in progress.
  - 6. Provide minimum 2 ft. overhang of protective covering on each side of wall, securely anchored.
  - 7. Do not apply uniform floor or roof loading for at least twenty-four (24) hours after completing masonry columns or walls.
  - 8. Do not apply concentrated loads for at least three days after completing masonry columns or walls.



## 1.07 HOT WEATHER PROTECTION

- A. Protect masonry construction from direct exposure to wind and sun when erected in an ambient air temperature of 99 degrees Fahrenheit in the shade with relative humidity less than 50%.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Face Brick
  - 1. Field Brick: To be selected by Architect, standard modular size (7-5/8" x 3-5/8" x 2-1/3").
  - 2. Accent Brick and Shape Brick: To be selected by Architect, standard modular size (7-5/8" x 3-5/8" x 2-1/3").
  - 3. Provide solid bricks at all areas where the ends of the bricks are exposed to view.
  - 4. Corner Brick: Provide solid special shape corner brick in rowlocks and soldiers. No mortar joints shall be allowed in exterior corners.
- B. Brick Not Exposed to View: Commercial commons conforming to Grade SW.
- C. Cleaning agents shall be as recommended by the brick manufacturer.
- D. Mortar Net: Provide MortarNet, as manufactured by Mortar Net Solutions of Portage, Indiana, in masonry wall cavities at all lintels, relief angles and at grade, above weep holes. Provide thicknesses as required to suit installation requirements.
- E. Weep Holes: CellVent as manufactured by Mortar Net Solutions of Portage, Indiana.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Condition of Surfaces: Inspect foundations to assure surfaces to support brick work are as follows:
  - 1. To proper grades and elevations and free of all dirt and other deleterious material.
  - 2. All surfaces not properly prepared have been satisfactorily corrected.
- B. Verify initial absorption rate of brick is within acceptable limits.

### 3.02 PREPARATION

- A. Reduce initial absorption of bricks by thoroughly wetting bricks with clean water 24 hours prior to placement. During extremely warm weather, wet bricks six to ten hours prior to placement.
- B. Remove all dirt, ice, loose rust and scale from all anchors, ties and reinforcement prior to installation.

### 3.03 INSTALLATION

- A. General: Do not install cracked, broken, or chipped masonry units exceeding ASTM allowances.
  - 1. Use masonry saws to cut and fix exposed units.
  - 2. No face brick is allowed smaller than one-half a full brick. No brick shall be cut horizontally in running bond.
  - 3. Lay brick plumb, true to line, and with level courses accurately spaced within allowable tolerances.
  - 4. Do not furrow bed joints.
  - 5. Stop off horizontal run by racking back in each course; toothing is not permitted.
  - 6. Adjust units to final position while mortar is soft and plastic.

7. If units are displaced after mortar has stiffened, remove, clean joints and units of mortar and relay with fresh mortar.
  8. Adjust shelf angles to keep work level and at proper elevation. Provide pressure relieving joints by placing a continuous 1/8" foam neoprene pad under the shelf angle.
  9. Joints shall be consistent 3/8" width, even in arches and/or radial pattern. Saw cut brick in such pattern.
  10. When joining fresh masonry to set or partially set masonry:
    - a. Remove loose brick and mortar.
    - b. Clean and lightly wet exposed surface of set masonry prior to laying fresh masonry.
- B. Protection of Work
1. Protect sills, ledges, and offsets from mortar drippings or other damage during construction.
  2. Remove misplaced mortar or grout immediately.
  3. Protect face materials against staining.
  4. Protect the door jambs and corners from damage during construction.
- C. Mortar Beds
1. Lay brick with full mortar coverage on horizontal and vertical joints in all courses. Provide sufficient mortar on ends of brick to fill head joints.
  2. Rock closures into place with head joints thrown against two adjacent bricks in place.
  3. Do not pound corners or gables to fit stretcher units after setting in place. Where adjustment to corners or jambs must be made after mortar has started to set, remove mortar and replace with fresh mortar.
- D. Joints
1. Horizontal and vertical face joints shall be as required to provide brick coursing to agree with concrete unit masonry. Joint widths wider than 3/8" must be approved by the Architect prior to construction of masonry. All joints shall be uniform.
    - a. Shove vertical joints tight.
    - b. Tool concave type joints when thumbprint hard using jointing tool.
    - c. Flush cut all joints not tooled.
    - d. Fill horizontal joints between top of masonry and underside of overhead elements.
- E. MortarNet Installation
1. Cavity shall be no more than 1/4" wider than the mortar net being installed.
  2. The installed mortar net shall touch both the outer wythe and the inner wall/substrate.
  3. Install one (1) continuous row of the mortar net at the base of the wall and over all wall openings directly on the flashing.
  4. Install flashings under the mortar net, and extend from the bottom of the mortar net to a minimum of 6" above the top of the mortar net.
  5. Cut the mortar net to accommodate the wall ties and wall masonry reinforcing and any other item penetrating the masonry cavity.
- F. Flashing
1. Clean surface of masonry smooth and free from projections which might puncture or otherwise damage flashing material.
  2. Place through-wall flashing on bed of mortar. Cover flashing with mortar. Step flashing on slopes. Refer to Section 07600.
- G. Weep Holes
1. Provide weep hole in head joints in first course immediately above all flashing, maximum spacing, 24" o.c.
  2. Keep weepholes and area above flashing free of mortar droppings.

- H. Sealant / Control Joints: Retain sealant joints around outside perimeters of exterior doors, window frames, and other wall openings. Locate masonry control joints as indicated on Drawings. Where not indicated, place control joints at maximum of 20' centers, after consulting with Architect at project site to verify locations. Joints in concrete unit masonry shall be at 40' centers, maximum. Refer to Section 07920 for joint sealants.

### 3.04 POINTING AND CLEANING

- A. Cut out any defective joints and holes in exposed masonry and repoint with mortar.
- B. Dry brush masonry surface after mortar has set at end of each day's work and after final pointing. Clean exposed unglazed masonry with stiff brush and clear water.
- C. Apply cleaning agent to sample wall area of 20 square feet in location acceptable to the Architect, if cleaning by water does not produce satisfactory results:
  - 1. Do not proceed with cleaning until sample area is acceptable to the Architect.
  - 2. Follow manufacturer's recommendation for use of cleaning agent. Thoroughly wet surface of masonry on which no efflorescence appears before using cleaning agent. Scrub with acceptable cleaning agent and immediately rinse with clear water. Work small sections at a time, working from top to bottom.
  - 3. Protect railings, metal lintels, and other materials which may corrode when masonry is cleaned with recommended solution.
  - 4. Remove efflorescence in accordance with brick manufacturer's recommendations.
- D. Leave work area and surrounding surfaces clean and free of mortar spots, droppings, and broken masonry.

END OF SECTION



SECTION 05120

STRUCTURAL STEEL FRAMING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Structural steel framing members, and support members.
- B. Base plates.
- C. Grouting under base plates.

1.02 REFERENCES

- A. AISC (AMAN) - ASD Manual of Steel Construction; American Institute of Steel Construction, Inc.; 1989, Ninth Edition.
- B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.; 2005.
- C. AISC S348 - Specification for Structural Joints Using ASTM A325 or A490 Bolts; 2004.
- D. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.
- E. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2004a.
- F. ASTM A 108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2003.
- G. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.
- H. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength; 2004.
- I. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2004b.
- J. ASTM A 325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Tensile Strength (Metric); 2004b.
- K. ASTM A 490 - Standard Specification for Structural Bolts, Alloy Steel, Heat-Treated, 150 ksi Minimum Tensile Strength; 2004a.
- L. ASTM A 490M - Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints (Metric); 2004a.
- M. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.
- N. ASTM A 501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2001.
- O. ASTM A 992/A 992M - Standard Specification for Structural Steel Shapes; 2004a.
- P. ASTM C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2002.

- Q. ASTM E 164 - Standard Practice for Ultrasonic Contact Examination of Weldments; 2003.
- R. ASTM F 959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners; 2005.
- S. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- T. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2004 and errata.
- U. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002.

### 1.03 SUBMITTALS

- A. See Architect for submittal procedures.
- B. Shop Drawings:
  - 1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
  - 2. Connections not detailed.
  - 3. Indicate cambers and loads.
  - 4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.
  - 5. Include embedment drawings.
  - 6. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pre-tensioned and slip-critical high-strength bolted connections.
  - 7. Reproduction of contract drawings, in any form, will not be accepted as shop drawings.
- C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.
  - 1. Structural steel including chemical and physical properties.
  - 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 3. Shear stud connectors.
  - 4. Shop primers.
- D. Mill Test Reports: Indicate structural strength, destructive test analysis and non-destructive test analysis.
- E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

### 1.04 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC "ASD Manual of Steel Construction".
- B. Comply with Section 10 of AISC "Code of Standard Practice for Steel Buildings and Bridges" for architecturally exposed structural steel.
  - 1. AISC "Seismic Provisions for Structural Steel Buildings" and supplements.
- C. AISC "Specification for Structural Steel Buildings-Allowable Stress Design and Plastic Design".
- D. RCSC's "Specification for Structural Joints using ASTM A 325 or A490 Bolts".
- E. Fabricator: Company specializing in performing the work of this section with minimum three years of documented experience.
- F. Erector: Company specializing in performing the work of this section with minimum three years of documented experience.

## 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.
  - 1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
  - 2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

## 1.06 COORDINATION

- A. Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. Steel Angles and Plates: ASTM A 36/A 36M.
- B. Steel W Shapes and Tees: ASTM A 992/A 992M.
- C. Rolled Steel Structural Shapes: ASTM A 992/A 992M.
- D. Steel Shapes, Plates, and Bars: ASTM A 242/A 242M high-strength, corrosion-resistant structural steel.
- E. Steel Plates and Bars: ASTM A 572/A 572M, Grade 50 (345) high-strength, columbium-vanadium steel.
- F. Cold-Formed Structural Tubing: ASTM A 500, Grade B.
- G. Hot-Formed Structural Tubing: ASTM A 501, seamless or welded.
- H. Steel Bars: ASTM A 108.
- I. Steel Plate: ASTM A 514/A 514M.
- J. Steel Sheet: ASTM A 1011/A 1011M, Designation SS, Grade 30 hot-rolled, or ASTM A 1008/A 1008M, Designation SS, Grade 30 cold-rolled.
- K. Pipe: ASTM A 53/A 53M, Grade B, Finish black.
- L. Shear Stud Connectors: Made from ASTM A 108 Grade 1015 bars.
  - 1. AWS D1.1, Type B.
- M. Sag Rods: ASTM A 36/A 36M.
- N. Carbon Steel Bolts and Nuts: ASTM A 307, Grade A galvanized to ASTM A 153/A 153M, Class C.
- O. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, medium carbon, galvanized.
- P. High-Strength Structural Bolts: ASTM A 490 (ASTM A 490M), with matching ASTM A 563 (ASTM A 563M) nuts and ASTM F 436 washers; Type 1 alloy steel.
- Q. Anchor Bolts: ASTM F1554, Grade 36.
- R. High-Strength Anchor Bolts: ASTM A 325, Type 1 medium carbon, plain.
- S. Load Indicator Washers: Provide washers complying with ASTM F 959 at all connections requiring high-strength bolts.
- T. Welding Materials: AWS D1.1; type required for materials being welded.
- U. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107 and capable of developing a minimum compressive strength of 7,000 psi at 28 days. Provide "100 Non-Shrink Grout" manufactured by Conspec.

- V. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
  - 1. Lead free alkyd primer; Tnemec 10-99 Series, Southern Coatings Environ-Guard 1-2900, or approved equal, meeting performance requirements of TT-P-86, Type I and passing ASTM B 117 after 500 hours with no blistering, cracking, softening, delamination, or rust creepage at scribe and rusting at edges.
- W. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

## 2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Space shear stud connectors as shown on drawings.
- C. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
- D. Fabricate connections for bolt, nut, and washer connectors.
- E. Develop required camber for members.

## 2.03 FINISH

- A. Prepare structural component surfaces in accordance with SSPC SP -2 and SP-3.
- B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, or in contact with concrete, high strength bolted, or field installed headed studs.
  - 1. Dry film thickness of not less than 2 mils.
- C. Galvanize structural steel members to comply with ASTM A 123/A 123M. Provide minimum 1.7 oz/sq ft galvanized coating.

## PART 3 – EXECUTION

### 3.01 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

### 3.02 ERECTION

- A. Erect structural steel in compliance with AISC "Code of Standard Practice for Steel Buildings and Bridges".
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. Field weld components and shear studs indicated on shop drawings.
- D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
- E. Do not field cut or alter structural members without approval of.
- F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

END OF SECTION



## SECTION 05310

### STEEL DECK

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Roof deck.
- B. Composite floor deck.
- C. Supplementary framing for openings up to and including 18 inches.
- D. Bearing plates and angles.
- E. Stud shear connectors.

##### 1.02 REFERENCE STANDARDS

- A. ASTM A 36/A 36M – Standard Specification for Carbon Structural Steel; 2008.
- B. ASTM A 108 – Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished; 2007.
- C. ASTM A 1008/A 1008M – Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardened; 2010.
- D. AWS D1.1/D1.1M – Structural Welding Code – Steel; American Welding Society, 2010.
- E. AWS D1.3 – Structural Welding Code – Sheet Steel; American Welding Society; 2008.
- F. SDI (DM) – Publication No. 31, Design Manual for Composite Decks, Form Decks, Roof Decks; Steel Deck Institute; 2007.
- G. SSPC-Paint 25 – Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II; Society for Protective Coatings; 1997 (Ed. 2004).

##### 1.03 PERFORMANCE REQUIREMENTS

- A. Refer to structural drawings for notes and details by structural engineer regarding Performance Requirements.

##### 1.04 SUBMITTALS

- A. See administrative requirements given by the architect for submittal procedures.
- B. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, cellular raceways and outlet box locations, pertinent details, and accessories.
- C. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

## 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Cut plastic wrap to encourage ventilation.
- B. Store deck on dry wood sleepers; slope for positive drainage.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Steel Joists:
  - 1. Canam Steel Corporation: [www.canam-steeljoists.ws](http://www.canam-steeljoists.ws).
  - 2. Nucor-Vulcraft Group: [www.vulcraft.com](http://www.vulcraft.com).
  - 3. Wheeling Corrugating Co.: [www.wheelingcorrugating.com](http://www.wheelingcorrugating.com).
  - 4. Requests for substitutions will be considered in accordance with provisions of Division 1.
    - a. All substitutions must be approved in writing by the Architect or Engineer-of-Record.
    - b. All applications for substitution must include samples and technical data.

### 2.02 STEEL DECK

- A. Refer to structural drawings for notes and details by structural engineer regarding Steel Deck.
- B. Roof Deck: Non-composite type, fluted steel sheet:
- C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:

### 2.03 ACCESSORY MATERIALS

- A. Refer to structural drawings for notes and details by structural engineer regarding Accessory Materials.
- B. Stud Shear Connectors: Made from ASTM A 108 Grade 1015 bars.

### 2.04 FABRICATED DECK ACCESSORIES

- A. Steel Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gage thick sheet steel; of profile and size as indicated; finished same as deck.
- B. Floor Drain Pans: When required. 14 gage sheet steel, flat bottom, sloped sides, recessed 1-1/2 inches below floor deck surface, bearing flange 3 inches wide, sealed watertight.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions prior to beginning work.

### 3.02 INSTALLATION

- A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

- B. Fasten deck to steel support members at ends and intermediate supports at 12 inches on center maximum, parallel with the deck flute and at each transverse flute using methods specified.
  - 1. Welding: Use fusion welds through weld washers.
- C. At welded male/female side laps weld at 18 inches on center maximum.
- D. Weld deck in accordance with AWS D1.3.
- E. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.
- F. Position floor drains with flange bearing on top surface of deck. Fusion weld at each deck flute.
- G. Weld stud shear connectors through steel deck to structural members below.
- H. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION



SECTION 05400

COLD-FORMED METAL FRAMING

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Load bearing formed steel stud exterior wall framing.

1.02 REFERENCES

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- B. AISI SG-971 - Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 1996, with 2000 supplement.
- C. AISI SG03-2 - 2002 edition of the Cold-Formed Steel Design Manual; American Iron and Steel Institute; 2002.
- D. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2004.
- E. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2004a.
- F. ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability; 2004b.
- G. ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability; 2004a.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2004 and errata.
- I. AWS D1.3 - Structural Welding Code - Sheet Steel; American Welding Society; 1998.
- J. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2000).
- K. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002.

1.03 SUBMITTALS

- A. See Architect for submittal procedures.
- B. Submit shop drawings and calculations sealed and signed by a professional engineer licensed in the state where project is located for review prior to fabrication.
- C. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, limitations, and load tables.
- D. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- E. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention, and manufacturer's standard details.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.
- B. Installer: Company specializing in performing the work of this section with minimum 3 years of experience.

#### 1.05 PROJECT CONDITIONS

- A. Verify that field measurements are as indicated on the drawings.
- B. Coordinate work of this section with the placement of components within the stud framing system.

### PART 2 – PRODUCTS

#### 2.01 MANUFACTURERS

- A. Metal Framing, Connectors, and Accessories:
  - 1. Dietrich Metal Framing: [www.dietrichindustries.com](http://www.dietrichindustries.com).
  - 2. Clark Steel Framing Systems: [www.clarksteel.com](http://www.clarksteel.com)
  - 3. United States Gypsum Company: [www.usg.com](http://www.usg.com)
  - 4. Nucon Steel [www.nuconsteel.com](http://www.nuconsteel.com).
  - 5. Substitutions: See Section 01 6000 - Product Requirements.

#### 2.02 FRAMING SYSTEM

- A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- B. Metal Framing Connectors and Accessories:
  - 1. Same manufacturer as framing.
- C. Maximum Spacing and Layout Requirements: See structural drawings.

#### 2.03 FRAMING MATERIALS

- A. Studs and Track: ASTM C 955; studs formed to channel shape with punched web; U-shaped track in matching nominal width and compatible height.
  - 1. Base Metal: Structural Steel (SS), 33 ksi minimum yield strength.
  - 2. Exterior Wall Studs, Minimum Size: See structural drawings.
  - 3. Galvanized in accordance with ASTM A 653/A 653M G90/Z275 coating.
  - 4. Provide components fabricated from ASTM A 1008/A 1008M, Designation SS steel.
- B. Framing Connectors: Factory-made formed steel sheet, ASTM A 653/A 653M SS Grade 50, with G60/Z180 hot dipped galvanized coating and factory punched holes.
  - 1. Structural Performance: Maintain load and movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold Formed Steel Structural Members; minimum 16 gage, 0.06-inch thickness.
- C. Fastening: Members may be fastened together by welds, screw fasteners, drilled anchors or power-driven fasteners that fit the particular application.
  - 1. Securely weld or screw track and studs for fascia, bulkheads, and furr downs to roof framing above to support fascia, bulkheads, and furr downs in tension.
  - 2. Track attachment to concrete may be by proper use of drilled anchors or power-driven fasteners.

3. Stud to track connections may be by welds or screw fasteners each side.
4. Provide non-movement connections for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

#### 2.04 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, 16 gauge.06-inch thickness, finish to match framing components.
- B. Plates, Gussets, Clips: Formed Sheet Steel, 16 gauge.06-inch thickness; finish to match framing components.
- C. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

#### 2.05 FASTENERS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A 153/A 153M.
  1. Where screw attachment is allowed and detailed on the drawings.
- B. Anchorage Devices: Power actuated.
- C. Welding: In conformance with AWS D1.1.

### PART 3 –EXECUTION

#### 3.01 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

#### 3.02 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C 1007 requirements or as detailed on the drawings.
- B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center or weld to structure as detailed on drawings. Coordinate installation of sealant with floor and ceiling tracks.
- C. Place studs at 16 inches on center typical; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using welding method.
- D. Construct comers using minimum of three studs. Install double studs at wall openings, door, and window jambs.
- E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
- F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
- G. Install intermediate studs above and below openings to align with wall stud spacing.
- H. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- I. Attach cross studs to studs for attachment of fixtures anchored to walls.
- J. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.
- K. Touch-up field welds and damaged galvanized surfaces with primer.

END OF SECTION



## SECTION 05440

### COLD-FORMED STEEL TRUSSES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Pre-engineered cold-formed steel trusses.
- B. Cold-formed steel framing accessories.

##### 1.02 DEFINITIONS

- A. Truss Component Manufacturer: The maker of the components that will be assembled into trusses by the Truss Fabricator. See MANUFACTURERS for acceptable Truss Component Manufacturer.
- B. Truss Fabricator: The manufacturer who assembles the Truss Component Manufacturer's components into completed trusses. See MANUFACTURERS for acceptable Truss Fabricators.
- C. Truss Designer: The design professional, individual or organization, having responsibility for the design of the trusses. In this case, the Truss Designer is the Truss Component Manufacturer.

##### 1.03 REFERENCES

- A. AISI SG-671 - Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; August 19, 1986 Edition with December 11, 1989 Addendum.
- B. AISI RG-9518 – Design Guide for Cold-Formed Steel Trusses; American Iron and Steel Institute; December 1995.
- C. ASTM A 370 – Standard Test Methods and Definitions for Mechanical Testing of Steel Products; 1997a.
- D. ASTM A 500 – Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 1999.
- E. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 1999a.
- F. LGSEA – Field Installation Guide for Cold-Formed Steel Trusses; Light Gauge Steel Engineers Association; October 1999.
- G. LGSEA 551d – Design Guide for Construction Bracing of Cold-Formed Steel Trusses; Light Gauge Steel Engineers Association; February 1997.
- H. LGSEA 551e – Design Guide for Permanent Bracing of Cold-Formed Steel Trusses; Light Gauge Steel Engineers Association; February 1998.

##### 1.04 SUBMITTALS

- A. See administrative requirements given by the architect for submittal procedures.

- B. Product Data: Truss Component Manufacturer's descriptive literature for each item of cold-formed metal framing and each accessory specified in this section.
- C. Shop Drawings: Detailed drawings prepared by Truss Fabricator that:
  - 1. Indicate special components and installations not fully detailed in product data.
  - 2. Indicate in the layout placement drawings the number, types, location, and spacings of trusses and other framing members.
  - 3. Indicate details of truss loading, reactions, uplifts, support locations, material sizes and gauges, permanent truss web bracing, and splices as required for a complete installation.
- D. Design Data: Results of design analysis, bearing the seal and signature of Truss Designer's engineer.
- E. Installation Instructions: Truss Component Manufacturer's printed instructions for handling, storage, and installation of each item of cold-formed metal framing and each accessory specified in this section.

#### 1.05 QUALITY ASSURANCE

- A. Provide design of trusses by Truss Component Manufacturer, using design methodologies recommended in AISI and LGSEA references.
  - 1. Determine mechanical properties of load bearing components by testing in accordance with ASTM A 370.
  - 2. Provide design by professional engineer registered in the state in which project is located.
  - 3. Provide Truss Fabricator's shop drawings.
- B. Pre-Installation Meeting: Meet at job site prior to scheduled beginning of installation to review requirements:
  - 1. Attendees: Require attendance by representatives of the following:
    - a. Truss Fabricator, if requested by installer.
    - b. Installer of this section.
    - c. Other entities directly affecting, or affected by, construction activities of this section, including but not limited to, the following:
      - (1) Installer of truss support framing.
      - (2) Installer of mechanical systems.
      - (3) Installer of electrical systems.
  - 2. Review potential interface conflicts, coordinate layout and support provisions.

#### 1.06 DELIVERY, STORAGE, AND HANDLING OF STEEL TRUSSES

- A. Pack, ship, handle, unload, and lift shop products in accordance with Truss Component Manufacturer's recommendations and in a manner necessary to prevent damage or distortion.
- B. Store and protect products in accordance with Truss Component Manufacturer's recommendations and in manner necessary to prevent damage, distortion, and moisture buildup.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Truss Component Manufacturer: TrusSteel Division of Alpine Engineered Products, Inc.; PO Box 2225, Pompano Beach, FL 33061. ASD. Tel: (888) 565-9181. [www.TrusSteel.com](http://www.TrusSteel.com) or approved equal.
- B. Acceptable Truss Fabricators: Truss components shall be fabricated into completed trusses by one of the following:
  - 1. Raney Truss, Decaturville, TN.

2. Wheelers Building Materials, Atlanta, GA.
  3. Cascade Manufacturing, Cascade, IA.
  4. Approved equal.
- C. Requests for substitutions will be considered in accordance with provisions of Division 1.
1. All substitutions must be approved in writing by the Architect or Engineer-of-Record.
  2. All applications for substitution must include samples and technical data.

## 2.02 COMPONENTS

- A. Pre-Engineered Cold-Formed Steel Trusses: TrusSteel truss component system by Alpine Engineered Products, Inc., providing a complete horizontal framing system, ready for deck installation, meeting specified requirements.
1. Truss Type, Span, and Height: As indicated on drawings.
  2. Comply with requirements of 1999 Standard Building Code.
  3. Deflection Under All Loads: 1/360 of span, maximum.
  4. Deflection Under Live Loads: 1/480 of span, maximum.
  5. Shop fabricate in accordance with shop drawings, using jiggling systems to ensure consistent component placement and alignment of components, and to maintain specified tolerances; field fabrication is strictly prohibited unless performed by authorized Truss Fabricator using Truss Fabricator's shop assemblers and proper jiggling systems.
  6. Shop fabrication of other cold-formed steel framing components into assemblies prior to erection is permitted; fabricate assemblies in accordance with shop drawings.
  7. Fasten connections within truss assembly with Truss Component Manufacturer's screws only and as shown on the shop drawings; welding and other fasteners are prohibited.
  8. Fabricate straight, level, and true, without rack, and to following tolerances:
    - a. Trusses up to 30 feet (9 m) long: Maximum ½ inch (12 mm) variation from design length.
    - b. Trusses over 30 feet (9 m) long: Maximum ¾ inch (19mm) variation from design length.
    - c. Trusses up to 5 feet (1500 mm) high: Maximum ¼ inch (6 mm) variation from design height.
    - d. Trusses over 5 feet (1500 mm) high: Maximum ½ inch (12 mm) variation from design height.
- B. Truss Chord and Web Components: Alpine TrusSteel components, with rolled or closed edges to minimize the danger of cutting during handling; chord and web components without rolled edges are prohibited.
1. Shapes, Sizes, and Thicknesses: As required to suit design and as indicated on shop drawings.
  2. Chords: Cold-formed from ASTM A 653/A 653/M galvanized steel sheet, minimum G60 coating; minimum yield strength of 55,000 psi (380 MPa).
    - a. Nominal 22 gage members:
      - (1) Minimum bare metal thickness: 0.0284 inch (0.72 mm).
      - (2) Maximum design thickness: 0.0299 inch (0.76 mm).
    - b. Nominal 20 gage members:
      - (1) Minimum bare metal thickness: 0.0329 inch (0.84 mm).
      - (2) Maximum design thickness: 0.0346 inch (0.88 mm).
    - c. Nominal 18 gage members:
      - (1) Minimum bare thickness: 0.0428 inch (1.09 mm).
      - (2) Maximum design thickness: 0.0451 inch (1.15 mm).
    - d. Nominal 16 gage members: (minimum top chord gage where trusses are at 5' spacing)
      - (1) Minimal bare metal thickness: 0.0538 inch (1.37 mm).
      - (2) Maximum design thickness: 0.0566 inch (1.44 mm).
  3. Webs: Cold-formed ASTM A 500 steel structural tubing; minimum yield strength of 45,000 psi (310 MPa).
    - a. Nominal 20 gage members:
      - (1) Minimum bare metal thickness: 0.033 inch (0.84 mm).
      - (2) Maximum design thickness: 0.035 inch (0.89 mm).
    - b. Nominal 18 gage members:
      - (1) Minimum bare metal thickness: 0.047 inch (1.19 mm).

- (2) Maximum design thickness: 0.049 inch (1.24 mm).
  - c. Nominal 16 gage members:
    - (1) Minimum bare metal thickness: 0.063 inch (1.6 mm).
    - (2) Maximum design thickness: 0.065 inch (1.65 mm).
- C. Fasteners used in Fabricating Trusses: Screw fasteners recommended by Truss Component Manufacturer, bearing stamp of Truss Component Manufacturer for ready identification.

## PART 3 - EXECUTION

### 3.01 EXECUTION

- A. Verify that bearing surfaces and substrates are ready to receive steel trusses.
- B. Verify that truss bearing surfaces are within the following tolerances:
  - 1. Variation from Level or Specified Plane: Maximum 1/8 inch in 10 feet (6 mm in 3 m).
  - 2. Variation from Specified Position: Maximum 1/4 inch (6 mm).
- C. Verify that rough-in utilities and chases that will penetrate plane of trusses are in correct locations and do not interfere with truss, bracing, or bridging placement.
- D. Inspect conditions under which installation is to be performed and submit written notification if such conditions are unacceptable to installer.
  - 1. Notify Architect/Engineer-of-Record within 24 hours of inspection.
  - 2. Beginning construction activities of this section before unacceptable conditions have been corrected is prohibited.
  - 3. Beginning construction activities of this section indicates installer's acceptance of conditions.

### 3.02 INSTALLATION

- A. Install trusses in accordance with Truss Component Manufacturer's instructions and Truss Fabricator's shop drawings. Use correct fasteners.
- B. Place components at spacings indicated on the shop drawings.
- C. Install all erection (temporary installation) bracing and permanent bracing and bridging before application of any loads; follow recommendations of LGSEA Field Installation Guide for Cold-Formed Steel Roof Trusses.
- D. Install erection bracing.
  - 1. Provide bracing that holds trusses straight and plumb in safe condition until decking and permanent truss bracing has been fastened to form a structurally sound framing system.
  - 2. All sub-contractors shall employ proper construction procedures to ensure adequate distribution of temporary construction loads so that the carrying capacity of any single truss or group of trusses is not exceeded.
- E. Install permanent bracing and bridging as shown in the Architect/Engineer-of-Record's drawings and notes as shown in the Truss Fabricator's shop drawings.
- F. Removal, cutting, or alteration of any truss chord, web or bracing member in the field is prohibited, unless approved in advance in writing by the Architect/Engineer-of-Record and the Truss Designer.
- G. Repair or replace damaged chords, webs, and complete trusses as directed and approved in writing in advance by the Architect/Engineer-of-Record and the Truss Component Manufacturer.

END OF SECTION



SECTION 05500  
METAL FABRICATIONS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Miscellaneous Metals:
1. Structural shapes for miscellaneous beams, columns, lintels, frames for wall, roof, and floor openings, miscellaneous bracing for door and window heads, anchor plates, inserts, clip angles, etc.
  2. Bearing plates for beams and anchors.
  3. Bolts and studs.
  4. Miscellaneous bracing angles and support angles.
  5. Steel lintels.

1.02 REFERENCES

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2002.
- B. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel; 2005.
- C. ASTM A 53/A 53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2004a.
- D. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.
- E. ASTM A 283/A 283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2003.
- F. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2004b.
- G. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2003a.
- H. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 1998.
- I. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2004 and errata.
- J. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings; 1999 (Ed. 2000).
- K. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002.
- L. SSPC-SP 2 - Hand Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

1.03 SUBMITTALS

- A. See Architect for submittal procedures.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

#### 1.04 QUALITY ASSURANCE

- A. All fabrication to be completed by a firm regularly engaged in metal fabrications with a minimum of three years' experience.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS - STEEL

- A. Steel Sections: ASTM A 36/A 36M.
- B. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
- C. Plates: ASTM A 283.
- D. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
- E. Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, galvanized to ASTM A 153/A 153M where connecting galvanized components.
- F. Welding Materials: AWS D1.1; type required for materials being welded.
- G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.
- H. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

#### 2.02 FABRICATION

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

#### 2.03 FINISHES - STEEL

- A. Prime paint all steel items.
  1. Exceptions: Galvanize items to be embedded in concrete or masonry and items specified for galvanized finish.
  2. Exceptions: Do not prime surfaces in direct contact with concrete, where field welding is required, and items to be covered with sprayed fireproofing.
- B. Prepare surfaces to be primed in accordance with SSPC-SP2.
- C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.



- D. Prime Painting: One coat.
- E. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A 123/A 123M requirements.
- F. Galvanizing of Non-structural Items: Galvanize after fabrication to ASTM A 123/A 123M requirements.

#### 2.04 FABRICATION TOLERANCES

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

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

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

#### 3.02 PREPARATION

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

#### 3.03 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.
- G. Bollards are to be filled with concrete, round top of bollard.

#### 3.04 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset from True Alignment: 1/4 inch.
- C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 05520  
STAIRS AND RAILS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials, fabrication, and erection of the metal stairs and railings.
- B. Closed riser stairs with concrete filled treads and platforms.
- C. Guard rails and handrails; interior and exterior conditions as shown in the drawings.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Concrete fill for treads and landings.
- B. Section 05120 - Structural Steel Framing: Steel members support stair systems.
- C. Section 05500 - Metal Fabrications: Miscellaneous metal items required for the complete and rigid installation of the metal stairs. Applicable portions of Section 05500 apply to this Section as if repeated herein.
- D. Section 06200 - Finish Carpentry: Preparation of metal and concrete stair components to receive hardwood treads and risers.
- E. Section 09900 - Painting: Application of finish painting over all exposed surfaces.

1.03 REFERENCE STANDARDS

- A. National Association of Architectural Metal Manufacturers (NAAMM): Metal Stairs Manual.
- B. National Association of Architectural Metal Manufacturers (NAAMM): Code of Standard and Practice for the Architectural Metal Industry ("Metal Manual").

1.04 SYSTEM PERFORMANCES

- A. Metal Stair Design Requirements: NAAMM minimum standards for fixed metal stairs construction, proportions, and dimensions: Commercial class.
  - 1. Stair loading
    - a. Live load: 100 Pounds per square foot uniformly distributed, minimum.
    - b. Minimum concentrated loads: 300 Pounds per square foot on four square inch at tread center.
    - c. Follow local code requirements if more stringent than indicated.
    - d. Stair tread deflection:  $L/360$ , maximum at rated loads.
    - e. Stair stringer deflection:  $L/360$ , maximum at rated loads.
  - 2. Concrete filled stair pans:
    - a. The concrete shall be flat, level and prepared to receive the finished flooring material.
- B. Structural Performances for Handrails not Serving as Top Rails: Provide railing assemblies which, when installed, comply with the following minimum requirements.
  - 1. Concentrated Load: 200 Pound load applied at any point and in any direction.
  - 2. Vertical and Horizontal Loading: 50 Pounds per linear foot uniform load applied in any direction.
  - 3. Loadings conditions above shall not be applied concurrently, but each shall be applied to produce maximum stress in each of the respective components or any of the supporting components.

## 1.05 QUALITY ASSURANCE

- A. Materials shall be free from defects impairing strength, durability, or appearance, of best commercial quality for purposes specified. Exposed surfaces throughout the building shall have the same inherent texture and color for like location. Fastenings shall, insofar as practicable, be non-corrosive, non-staining, and concealed. Fastenings which must be exposed shall be of the same material, color, and finish as material to which applied, and shall be countersunk and finish flush. Exposed welds shall be ground smooth to form a neat, uniform fillet without weakening base metal. Moulded, bent, or shaped members shall be formed with clean, sharp arises, without dents, scratches, cracks, or other defects. Provide all anchors, bolts, shims, and accessory items required for building into fastening to adjacent work.
- B. Fabricate in accordance with NAAMM "Metal Manual", except where more stringent requirements are indicated, to meet the minimum requirements for commercial classification, closed risers.

## 1.06 SUBMITTALS

- A. Copies of shop drawings and complete erection data shall be furnished to the Architect on all items specified in this Section. Show all dimensions, welds, anchorages whether provided by the stair manufacturer or required to be installed by others. Show relationship to adjacent materials/work. Shop drawings shall bear the seal of a structural engineer licensed in the State in which the project is constructed. Submit shop drawings in accordance with Section 01340 prior to any fabrication.

## 1.07 FIELD MEASUREMENTS

- A. Take all necessary field measurements to verify or supplement dimensions shown on the drawings. Be responsible for furnishing all necessary instructions for the setting of anchors, bearing plates, and miscellaneous items. Ascertain that all materials are properly set during the progress of work.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Steel Stairs and Platform: Fabricate in the shape and size as shown on the Drawings, with risers, treads and landing backing being formed from minimum 12 gauge steel. Structural supports and stringers shall be as indicated on the drawings. All exposed steel connections shall be welded with welds ground smooth. Face stringers shall be neatly fitted to connecting members and shall have closed ends. After fabrication, all members shall be given a shop coat of rust inhibitive primer.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Verify that structure is ready to receive the steel stairs, and that all supporting members are properly located, plumb, level and rigidly anchored and/or connected. Correct all irregularities detrimental to the stair installations prior to installing any metal stairs or landings.
- B. Verify that required sleeves and weld plates have been properly located and set prior to installing railings.

### 3.02 ERECTION

- A. Stairs shall be erected plumb and straight and to proper lines. Connection to walls and other construction shall be made in complete accordance with fabricator's instructions.

B. Handrails and Railings

1. All handrails and railings shall be fabricated in the sizes and shapes shown on the drawings. Steel railings shall have all connections shall be welded and all welds will be ground smooth. After fabrication, all handrails and railings shall receive the specified paint finish.
2. Clean field welds, bolted connections, and abraded areas. Apply primer compatible with shop applied primer.
3. Anchor railings to walls.

3.03 PAINTING AND PROTECTIVE COATING

- A. Clean all surfaces and apply one shop coat of Zinc Rich primer. Anchors that are built into masonry shall be coated with asphalt paint unless specified to be galvanized. Metal work to be encased in concrete shall be left unpainted unless specified or noted otherwise. Refer to Section 09900 for field application of paint to ferrous metals and galvanized surfaces.

3.04 PROTECTION

- A. Protect installed stairs from damage until date of Substantial Completion. Damaged factory prime coats shall be corrected immediately. Remove all rust before re-priming. Where touch-up is required sand or steel wool prime coat to feather edge and brush out touch-up to provide a smooth finish surface ready for job painting.

3.05 CLEANING

- A. Before Substantial Completion Inspection, remove all protective maskings and coverings, and clean exposed surfaces of foreign matter. At the completion of this work, remove from the site all excess materials and debris. Leave entire work area in a neat workmanlike condition ready for final inspection.

END OF SECTION



SECTION 05800  
EXPANSION CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes expansion joint devices for roofs, walls, floors, and ceilings.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Expansion joint cover anchored to concrete slab.
- B. Section 04210 - Brick Masonry: Expansion joint cover installed in brick veneer.
- C. Section 04200 - Reinforced Unit Masonry: Expansion joint cover installed in conjunction with C.M.U.
- D. Section 07100 - Waterproofing and Dampproofing: Expansion joint cover installed in conjunction with the weather barrier.
- E. Section 07464 - Fiber-Cement Siding, Trim and Soffit: Expansion joint cover installed in conjunction with fiber cement products.
- F. Section 07530 - Single-Ply Membrane Roof: Expansion joint cover installed between fiber cement siding and membrane roofing system.

1.03 REFERENCES

- A. ASTM B 221: Aluminum and Aluminum Alloy, Extruded Bar, Rod, Wire, Shape, and Tube.
- B. ASTM B 308: Aluminum Alloy, 6061-T6 Standard Structural Shapes, Rolled or Extruded.

1.04 SUBMITTALS

- A. Provide submittals in accordance with Section 01340.
- B. Product Data: Submit manufacturer's technical data describing materials and installation instructions; submit independent laboratory test reports certifying test results for fire-rated assemblies.
- C. Shop Drawings: Indicate device profiles, finishes, dimensions, locations, affected adjacent construction, anchorage devices, and location and method of splicing.

1.05 QUALITY ASSURANCE

- A. Provide UL listed closures with joint devices to ensure integrity of fire-rated assemblies.

1.06 PRODUCT DELIVERY, STORAGE, & HANDLING

- A. Deliver products in manufacturer's original packaging with labels intact. Store under cover in dry location until installed. Store off ground, protect from weather, intrusion of foreign materials and construction activities.
- B. Cover exposed metal/aluminum surfaces with manufacturer's standard protective paper or wrapping.

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
  - 1. Construction Specialties, Inc. (C/S Group) of Muncy, Pennsylvania.
  - 2. Balco Inc. of Wichita, Kansas.
  - 3. MM Systems Corporation of Pendergrass, Georgia.
- B. EPDM Gutter: 60 mil flexible internal gutter for roof expansion joints
  - 1. Johns Manville, or equal as approved by Architect.

### 2.02 MATERIALS

- A. Aluminum: Extruded, ASTM B 221, alloy 6063-T5 or ASTM B 308.
- B. Elastomeric: Closed cell Neoprene or EPDM. PVC is not acceptable on exterior joint devices.
- C. Threaded Fasteners: Aluminum or stainless steel.

### 2.03 TYPES & LOCATIONS

- A. Refer to Drawings for expansion joint locations.
- B. Model numbers referenced herein are by Construction Specialties, Inc unless noted otherwise.
- C. Exterior Products:
  - 1. Wall to Wall - Exterior: No. VF-200
  - 2. Roof to Wall: No. BRJ-100
  - 3. Roof to Wall – internal gutter: 90 mil EPDM roofing.
- D. Interior Products:
  - 1. Standard components and accessories for suspended gypsum board ceiling systems. Refer to Section 09250.
  - 2. Manufacturer's standard aluminum flanged interior wall and ceiling expansion covers.
    - a. Interior conditions in gypsum board assemblies: FWF-200
    - b. Interior conditions in gypsum ceiling systems: FWF-200
- E. Other conditions not listed here: Selected from manufacturer's standard devices.

### 2.04 FINISH

- A. Exposed Extruded Sections on Walls: Pre-finished white or primed for field painting.
- B. Elastomeric Fillers: White or paintable.

### 2.05 FABRICATION

- A. Back paint components in contact with cementitious materials to prevent electrolysis.
- B. Shop assemble components and package with anchors and fittings.
- C. Provide joint components in single lengths wherever practical. Minimize site splicing.
- D. Fabricate seismic joint covers capable of movement in all directions.



## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify that surfaces are properly aligned and suitable to receive expansion joint devices.

### 3.02 INSTALLATION

- A. Install expansion joints devices and components in accordance with manufacturers' printed instructions.
- B. Align work plumb and level, flush with adjacent finish except where detailed otherwise.
- C. Rigidly anchor to substrate to prevent movement or misalignment.
- D. Shingle-to-shingle condition, install the expansion cover as flat as practicable and allowed by the manufacturer for the joint size and expected movement. Install shingles as close to the cover as allowed by the manufacturer to minimize visibility.
  - I. Install EPDM internal gutters as shown in drawings. At ends, seal gutter except 1/2" diameter drain hole with mesh bug screen. Gutter shall be continuous from ridge to eave, sealed with manufacturer's approved adhesive.

### 3.03 CLEANING

- A. Remove manufacturer's protective paper after finish work in adjacent areas has been completed. Upon removal, clean exposed surfaces with suitable cleaner that will not harm factory applied finishes.

### 3.04 PROTECTION

- A. Protect completed installation from damage by construction operations. Replace damaged items prior to date of Substantial Completion inspection.

END OF SECTION



SECTION 06100  
ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SUMMARY

- A. This section includes the following:
1. Wood blocking.
  2. Wood nailers, furring and grounds.
  3. Plywood backing panels.
  4. Underlayment materials.

1.02 RELATED WORK

- A. Related Sections Include:
1. See structural drawings for specific framing materials and accessories not specified herein.

1.03 SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product indicated.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that materials comply with requirements.

PART 2 – PRODUCTS

2.01 WOOD PRODUCTS, GENERAL

- A. Lumber: DOC PS 20 and applicable rules of lumber grading agencies certified by the American Lumber Standards Committee Board of Review.
1. Factory mark each piece of lumber with grade stamp of grading agency.
  2. Provide dressed lumber, S4S, unless otherwise indicated.
  3. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness, unless otherwise indicated.

2.02 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. Preservative Treatment by Pressure Process: AWPA C2 (lumber) and AWPA C9 (plywood), except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).
1. Preservative treatment material shall be compatible with zinc coated fasteners and framing connectors.
- B. Fire Retardant Treated Lumber:
1. Except as allowed by the governing codes, wood used for framing, blocking, and fire-blocking shall be Fire Retardant Treated.
  2. Manufacturer: Chemical Specialties, Inc. (CSI). One Woodlawn Green, Suite 250, 200 East Woodlawn Road, Charlotte, NC 28217; Telephone: (800) 4218661, (704) 522-0825; Fax: (704) 527-8232; E-mail: productinfo@chemspec.com; Web site: www.treatedwood.com.

3. Fire Retardant Treatment: Manufacturer's proprietary solution for fire retardant treatment of wood. Treatment Testing: Provide D-Blaze FRT wood treatment which has been tested by Underwriters Laboratories, Inc., (UL) of Northbrook, IL, and has been designated UL classification FRS which signifies a flamespread and smoke developed rating of 25 or less. When tested for 30 minutes, there shall be no evidence of significant progressive combustion. Each piece of treated material shall bear a UL classification stamp and meet or exceed requirements for Class 1 or Class A flamespread ratings.
- C. Kiln-dry material after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
  - D. Mark each treated item with treatment quality mark of an inspection agency approved by the American Lumber Standards Committee Board of Review.
  - E. 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 members less than 18 inches above grade.
    4. Wood floor plates that are installed over concrete slabs directly in contact with earth.

#### 2.03 DIMENSION LUMBER

- A. General: Of grades indicated according to the American Lumber Standards Committee National Grading Rule provisions of the grading agency indicated.
- B. Non-Load-Bearing Interior Partitions: Construction, Stud, or No. 2 grade and any of the following species:
  1. Mixed southern pine; SPIB.
  2. Eastern softwoods; NELMA.
  3. Northern species; NLGA.
  4. Western woods; WCLIB or WWPA.
- C. Framing Other Than Non Load-Bearing Framing: See structural plans.

#### 2.04 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber for support or attachment of other construction, including the following:  
Plates, Gussets, Clips: Formed Sheet Steel, 16 gauge.06-inch thickness; finish to match framing components.
  1. Blocking.
  2. Nailers.
  3. Furring.
  4. Grounds.
- B. For items of dimension lumber size, provide Construction, Stud, or No. 2 grade lumber with 19 percent maximum moisture content of any species.
- C. For concealed boards, provide lumber with 19 percent maximum moisture content and any of the following species and grades:
  1. Mixed southern pine, No. 2 grade; SPIB.
  2. Eastern softwoods, No. 2 Common grade; NELMA.
  3. Northern species, No. 2 Common grade; NLGA.
  4. Western woods, Construction or No. 2 Common grade; WCLIB or WWPA.

## 2.05 PLYWOOD BACKING PANELS

- A. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2 inch thick.

## 2.06 UNDERLAYMENT MATERIALS

- A. Roofing Felt: Asphalt-saturated organic felt complying with ASTM D 226, 30 lb. Asphalt saturated felt, unperforated.
  - 1. Installed in the following locations.
    - a. Install at time roof sheathing is placed

## 2.07 MISCELLANEOUS MATERIALS

- A. Fasteners:
  - 1. Power-Driven Fasteners: CABO NER-272.
  - 2. Bolts: Steel bolts complying with ASTM A 307, GRADE A; with ASTM A 563 hex nuts and, where indicated, flat washers.

## PART 3 –EXECUTION

### 3.01 EXAMINATION

- 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 furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
  - 1. CABO NER-272 for power-driven fasteners.
  - 2. Published requirements of metal framing anchor manufacturer.
  - 3. Table 2304.9.1, "Fastening Schedule," in the International Building Code.
- C. Fastening Methods:
  - 1. Wall and Roof Sheathing: See structural drawings.
  - 2. Decking: Use finishing nails. Countersink nail heads and fill holes with wood filler.
  - 3. Plywood Backing Panels: Nail or screw to supports.
  - 4. Building paper at roofing: Galvanized staples or roofing nails.
- D. Apply building paper and roofing felts shingle lapped with 2-inch overlap and 6-inch end lap. At roofing locations, cover upstanding flashing with 4-inch overlap.

END OF SECTION



SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes but is not limited to the materials and installation of:
  - 1. Fixed and adjustable shelving, including wall standards.
  - 2. Interior wood standing and running trim items.
  - 3. Other items shown or as may be required to complete the Work.

1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood nailers and blocking required for the installation of finish carpentry items.
- B. Section 06415 - Cabinetry and Millwork: Applicable portions of this Section apply to Section 06415 as if repeated therein.
- C. Section 08710 - Finish Hardware: Wood doors to be machined to receive finish hardware items.
- D. Section 09250 - Gypsum Wallboard: Coordination of gypsum wallboard construction with the finish carpentry installations.
- E. Section 09900 - Painting: Finishing of finish carpentry items.

1.03 QUALITY ASSURANCE

- A. Woodworking Standards
  - 1. Design and Construction Features: Comply with details and profiles shown. Where not otherwise shown, comply with applicable AWI Quality Standards, with alternate details at fabricator's option.
  - 2. All shelving shall be manufactured to meet the quality standards of the Architectural Woodwork Institute, AWI Section 600, Premium Grade.
  - 3. All wood trim shall be manufactured and installed to meet the quality standards of the Architectural Woodwork Institute, AWI Section 300, Custom Grade.
    - a. Comply with details shown for profile and construction wood trim and millwork items. Where not otherwise shown, comply with applicable AWI Quality Standards, with alternate details at fabricator's option.
  - 4. Installation of Interior Millwork Items: Comply with requirements of the Architectural Woodwork Institute, AWI Section 1700.
- B. Grading Standards
  - 1. Moisture Content: The maximum moisture content of treated or untreated finish lumber, trim and millwork is not to exceed 10% at the time of delivery.
  - 2. Grading Standards: Softwood framing lumber shall comply with Product Standard 20 and with the specific grading association standards and specifications listed below:
    - a. Southern Pine: Standard Grading Rules for Southern Pine Lumber, published by Southern Pine Inspection Bureau and trademarked SPIB.
  - 3. All plywood shall be manufactured in accordance with U.S. Product Standard PS-10 and grademarked.
  - 4. All board lumber shall comply with PS 20 and grademarked by either of the associations listed in paragraph above.
  - 5. Hardwood lumber shall comply with National Hardwood Lumber Association rules.

#### 1.04 SUBMITTALS

- A. Submit shop drawings for the following:
  - 1. Shelving: Show shelving layouts, shelf spacing and standards anchorage as well as types of anchorages for the substrates involved. Submittals shall also show shelf construction and materials used in manufacture.
  - 2. Standing and running trim shapes, and materials.
- B. Samples – Wood and Flexible Trim: Two (2) samples of each profile, 24" long (moldings and trim), with finish applied.
- C. Submit product data for shelf standards and brackets and clothes rod. Include manufacturer's suggested anchorage requirements.

#### 1.05 PRODUCT DELIVERY, STORAGE, HANDLING, AND PROTECTION

- A. Protect materials during transit, delivery and handling to prevent damage, soiling and deterioration.
- B. Inspect all materials delivered and reject all not qualifying completely with the requirements, damaged in transit or in handling, or otherwise unsatisfactory.
- C. Deliver, store and handle cabinets in a manner to prevent damage and deterioration. Defer delivery to job until the installation and storage areas are complete and dry of all wet-type construction. Relative humidity in storage areas shall be maintained at and shall not exceed 60 percent.

#### 1.06 JOB CONDITIONS

- A. Do not install finish carpentry until required temperature and relative humidity conditions have been stabilized and will be maintained in installation areas.
- B. Maintain temperature and humidity in installation area as required to maintain moisture content of the installed finish carpentry within 1.0% tolerance of optimum moisture content, from date of installation through remainder of construction period.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Painted Interior Trim Material including door frames and windowsills: Paint grade Poplar, manufactured to sizes, patterns and profiles detailed. Finger jointed material will be acceptable where opaque finish is to be applied.
- B. Plywood: Comply with U.S. Product Standard PS 1, Group 1, Douglas Fir unless otherwise specified or noted. Use exterior grade only, without visible patches or repairs on exposed sides.
  - 1. A-B Grade: Where both faces are exposed.
  - 2. A-C Grade: Where only one face is exposed.
- C. Wood Glue: Waterproof type as recommended by AWI standards for the particular application.
- D. Veneer Plywood
  - 1. Paint Grade Yellow Poplar to match trim or stain grade birch, except at reception counter and check in desk.
  - 2. Stain grade, Red Birch, grade A, quarter sawn, book matched at reception counter and check in desk.
  - 3. Type: A/C.



- E. Adjustable Shelf System
  - 1. Shelf Standards: Bronze colored steel standard; 5/8" wide x 3/16" thick; length as shown in drawings; pre-drilled for screw mounting.
  - 2. Adjustable heavy duty steel shelf brackets. Depth shown in drawings.
- F. Windowsills
  - 1. Paint grade, Yellow Poplar.
  - 2. See drawings for sizes and profile. All windowsill profiles shall be mitered back to wall per the drawings.
- G. Flexible Trim: Flexible, paintable, polyurethane trim, in profiles shown in the drawings, sufficiently flexible to accommodate the required radiuses.
  - 1. As manufactured by Flex Trim by Carter Millwork, or equal product approved by the Architect.
- H. Resilient base: See section 09660 – Resilient Flooring.

## 2.02 FABRICATION

- A. Woodwork
  - 1. Interior trim shall be "Custom Grade". Trim shall be manufactured from solid stock meeting the following requirements:
    - a. Minor warp which can be held flat and straight with normal nailing.
    - b. Natural and manufacturing defects in excess of those permitted in the grade specified are permitted if such defects are to be covered by adjoining members or otherwise concealed.
    - c. Trim members for application on flat surfaces shall have the reverse side "backed out", except members with exposed ends.
    - d. Custom grade pieces shall be smoothly machined with top flat surfaces machine sanded. Depressed flat surfaces and molded contours shall be smoothly machined.
  - 2. Carefully fit equipment to be installed into millwork. Provide filler pieces when required.
  - 3. Protection: Exposed ends of millwork to be sealed with two coats of spar varnish.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Inspect all materials delivered and reject all not qualifying completely with the requirements, damaged in transit or in handling, or otherwise unsatisfactory.
- B. All finish carpentry shall be executed by skilled mechanics in strict accordance with the details. Protect finish carpentry items against dampness during and after delivery. Store under cover in well ventilated spaces, not exposed to extreme changes in temperature and excess humidity. Make field measurements where required for close fit.
- C. Install with minimum number of joints possible, using full-length material to greatest extent possible. Stagger joints in adjacent and related members. Cope at returns; miter at corners, to produce tight fitting joints with full surface contact throughout the length of the joint. Use scarf joints for end-to-end joints.
- D. Secure work to grounds, otherwise fasten in position to hold correct surfaces, lines, levels. Make finished work flat, plumb, true. As far as possible, conceal fastenings; where not possible locate them in inconspicuous places.
  - 1. Install all woodwork items in accordance with referenced standards; use blind nailing or glue. Any face nails shall be set in and puttied.
  - 2. Screws shall be used for attachment to metal; setting and stopping of screws shall be in the same manner as required where nails are used.
  - 3. Set all nail heads. Counter-sink all screw heads.

- E. Loose Joints: Use judgment in locating loose joints to render them inconspicuous as possible in finished work.
- F. Expansion Joints: Construct to permit sections to expand and contract without buckling, warping, causing other conditions which will detract from appearance, durability.
- G. Flexible trim shall be joined and finished smooth without visible joints.

### 3.02 CLEANING

- A. At the completion of this work, remove from the job site all excess materials and debris. Leave entire work ready to receive the specified or scheduled finish.

### 3.03 PROTECTION

- A. Protect finished installations from damage until date of Substantial Completion. Repair or replace any damage at no additional cost to the Owner as directed by the Architect.

END OF SECTION

## SECTION 06415

### CABINETS AND MILLWORK

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes but not limited to the materials, manufacture, and installation of:
  - 1. Plastic laminate countertops, aprons, and backsplashes.
  - 2. Plastic laminate faced cabinetry.
  - 3. Custom manufactured cabinetry and millwork.
  - 4. Other items as indicated on the Drawings.
- B. See section 01010 – Summary of Work for Owner Furnished Contractor Installed Cabinets specified herein.

##### 1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood nailers and blocking required for the installation of cabinetry and millwork items.
- B. Section 09250 - Gypsum Wallboard: Completion of the gypsum wallboard installation prior to installation of the cabinetry and millwork.
- C. Section 09660 - Resilient Flooring: Coordination of flooring and base installation with the setting in place of the cabinetry and millwork.
- D. Section 09300 - Tile: Coordination of tile installation with the setting in place of the cabinetry and millwork.
- E. Section 09900 - Painting: Completion of painting operations prior to installing cabinetry and millwork items.

##### 1.03 QUALITY ASSURANCE

- A. Woodworking Standards
  - 1. Design and Construction Features: Comply with details shown for profile and construction of tops and cabinetry. Where not otherwise shown, comply with applicable AWI Quality Standards, with alternate details at fabricator's option.
  - 2. All cabinetry and tops shall be manufactured to meet the quality standards of the Architectural Woodwork Institute, AWI Sections 400, 400-S-4 and 400B, Custom Quality with high-pressure plastic laminate factory finish and transparent, as detailed. AWI Section 400-S-4 shall be used for thickness of materials for cabinet construction.
- B. Installation: Comply with requirements of the Architectural Woodwork Institute, AWI Section 1700.

##### 1.04 SUBMITTALS

- A. Submit copies of shop drawings and technical data and two (2) physical samples of cabinet material and top with finishes applied, to the Architect in accordance with Section 01340. Shop drawings shall show all cabinet/millwork layouts with Room Numbers indicated, materials, construction, joinery, species of wood and finish(es).
- B. Submit plastic laminate color chips for Architect's color selection. Submit millwork samples with transparent finish applied, as directed by the Architect. Submit plastic laminate edge profiles. Submit all hardware exposed to view, including pulls and knobs.

## 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle cabinetry and millwork items in a manner to prevent damage and deterioration. Defer delivery to job until the installation and storage areas are complete and dry of all wet-type construction. Relative humidity in storage areas shall be maintained at and shall not exceed 60 percent.

## PART 2 - PRODUCTS

### 2.01 GENERAL

- A. All Cabinetry, Millwork, and Tops shall be factory fabricated and delivered to the job site completely finished with hardware installed. All glue used in millwork manufacturing shall be waterproof, as recommended by AWI for the particular application involved. Cabinetry will be provided with factory applied plastic laminate finish with melamine liner.
- B. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures and fittings.

### 2.02 PLASTIC LAMINATE COUNTERTOPS, APRONS, BACKSPLASHES

- A. Plastic Laminate: Shall be standard grade, 1/16" thick, general purpose material complying with current NEMA Standard and LD-3. Comply with ANSI A161.2. Provide the following:
  - 1. GP 50: Horizontal Grade.
  - 2. GP28: Vertical Grade.
  - 3. CL 20: Cabinet Liner.
  - 4. BK 20: Backing Sheet.
  - 5. PF-40: Post Forming Grade.
  - 6. FR 32: Vertical application, fire retardant material.
- B. Plastic Laminate Acceptable Manufacturers
  - 1. Formica Corporation
  - 2. WilsonArt International, Inc.
  - 3. Laminart
  - 4. Nevamar/International Paper Decorative Products
  - 5. Pionite/Pioneer Plastics Corporation
- C. Core
  - 1. Shall be Particleboard, complying with ANSI A208-2, 45-lb. density, minimum 3/4" thick fire retardant type, formaldehyde free binders, in accordance with ASTM E84 and the following:
    - a. Flame Spread: 25 maximum
    - b. Smoke Developed: 25 maximum
    - c. Fuel Contributed: 25 maximum
- D. Adhesives
  - 1. Wood Glue: Waterproof types as recommended by AWI standards for the particular application.
  - 2. Plastic Laminate: Provide one (1) of the following products subject to conformance with the requirements specified.
    - a. Non-Flammable:
      - (1) "DAP Weld-Wood, Non-Flammable Type" - DAP, Inc.
      - (2) Molded Trim Adhesive - As recommended by molding manufacturer for intended use.
- E. Where shown, countertops shall have 3/4" x 4" high separate matching backsplash and matching aprons.
- F. In locations as required by local codes or ordinances, provide fire retardant countertop assemblies, as tested in accordance with ASTM E 84.

## 2.03 WOOD CABINETS WITH PLASTIC LAMINATE FINISH

- A. General: Cabinet interiors shall have melamine surface on interiors. Drawer heads and door backs shall have BK-20 backing sheet.
- B. Hardwood Plywood: ANSI/HPMA HP hardwood and decorative plywood, Good Grade (1) or better, of thickness, species, cut, and core construction indicated.
- C. Hardwood Lumber: Clear, dry, sound, and free of defects selected from First Grade lumber (NHLLA), of species indicated.
- D. Hardboard: ANSI A135.4, Class 1, tempered.
- E. Solid Lumber: Dry, sound, selected to eliminate appearance defects, of any species of hardwood or softwood with color and grain characteristics similar exposed portions
- F. Plastic Laminate: As specified under Paragraph 2.02 A and B. Provide on all exposed faces, edges and ends.
- G. Style of face construction for base, wall, and full-height units, if any, with drawer fronts, doors, and fixed panels as follows:
  - 1. Reveal overlay design or as shown on Drawings.
  - 2. Door Construction: Lumber core plywood, 5-ply with hardwood face veneer and crossbanding.
  - 3. Drawer Front Construction: Same as door or, where standard with manufacturer, solid or glued-up lumber, not less than 1/2" thick.
- H. Construction for face frame style casework as follows:
  - 1. Rails and Stiles: Not less than 1-inch by 1-5/8 inch solid lumber with glued mortise and tendon joints.
  - 2. Exposed Ends: Not less than 1/2 inch thick, medium-density particle board core with exterior veneer to match door and drawer fronts and not less than 4-mil vinyl laminate on interior surfaces. Connect to stile with pressure-glued tongue and plow joint and supplement by concealed mechanical fasteners.
  - 3. Unexposed Ends: Not less than 1/2 inch thick, medium-density particle board with not less than 4-mil prefinished vinyl laminate on interior surfaces. Attach to front frame in same manner as exposed ends.
  - 4. Back, Top, and Bottom Rails: Not less than 3/4 inch by 3 inch solid lumber, machined to interlock with end panels, and rabbeted to receive top and bottom panels; with back rails secured under pressure with glue and mechanical fastening devices.
  - 5. Shelving: Not less than 5/8 inch thick particle board core plywood or 1/2 inch thick medium-density particle board prefinished with melamine finish on top, bottom, and exposed (front) edge.
- I. Construction for wall units with doors and fixed panels as follows:
  - 1. Tops and Bottoms: Not less than 1/2 inch thick particle board or 3/8 inch thick hardwood plywood, fully supported by and secured in rabbets in end panels, front frame, and back rail. Provide with melamine finish on cabinet interior.
  - 2. Backs: Not less than 1/8 inch hardboard or 3/16 inch plywood with melamine finish, fastened to machined rear edge of ends and to top and bottom hanger rails.
- J. Construction for base units with doors and fixed panels as follows:
  - 1. Front Frame Drawer Rails: Not less than 1 inch by 1-1/4 inch lumber mortised and fastened into face frame.
  - 2. Bottoms: Not less than 1/2 inch thick particle board with melamine finish or 3/8 inch thick, 5-ply veneer core plywood with melamine finish, fully supported by and secured in rabbets in end panels, front frame, and back bottom rail.
  - 3. Back Panels: Not less than 1/8 inch thick hardboard fastened to machine rear edge of end panels and to top and bottom rails. Interior surface shall be melamine.
  - 4. Toe Boards: Not less than 5/8 inch particle board core attached between end panels and extended from bottom panel to floor.
  - 5. Corner Blocks: Glued and fastened in each of four top corners to maintain cabinet squareness and rigidity.

K. Construction for drawer units as follows:

1. Drawer Body: Not less than 3/8 inch thick with melamine finish subfront, back, and sides. Provide box-type construction with subfront and back rabbeted into sides and secured with glue and mechanical fasteners. Exposed fronts fastened to subfront with mounting screws from interior of body. Drawer bottom of not less than 1/4 inch thick hardboard, set into rabbets in back, sides, and front.

L. Millwork Hardware Manufacturers

1. Grant Hardware Company (Grant).
2. The Engineered Products Company (EPCO).
3. Grass America Inc. (Grass).
4. Häfele America Company (Häfele).
5. Knappe & Vogt Manufacturing Company (K&V).
6. Liberty Hardware Mfg. Company (Liberty).
7. National Lock Cabinet Hardware (National).
8. Stanley Hardware, Div. of the Stanley Works (Stanley).
9. Universal Industrial Products Company (SOSS).

M. Hardware Items

1. Door and drawer pulls: Hickory Hardware P9720-10B, 3-1/2" centers.
2. Knobs: Hickory Hardware K344-10B, 1-1/4" knobs.
3. Magnetic catches: EPCO; #560.
4. Concealed cabinet hinges:
  - a. 95° self-closing 3D type, zinc die cast with cover caps: Häfele; Duomatic 329.01 Series.
  - b. 165° self-closing 3D type, zinc die cast with cover caps: Häfele; Duomatic 329.07 Series.
  - c. Mortised concealed hinges: SOSS Invisible Hinge.
5. Drawer slides, side mount: Accuride; Model 3837, full extension, 100 lb. capacity.
6. Accessories: Bolts, nuts, washers, screws, toggle bolts, and fasteners indicated or required to attach and secure work under this section.

N. Hardware Finishes: Coordinate finishes of exposed cabinet hardware with adjacent finish hardware as specified in Section 08710.

## 2.04 FABRICATION

A. General

1. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
2. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trip for scribing and site cutting.
3. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings.

B. Woodwork

1. Construction shall be "Custom Grade":
  - a. Natural and manufacturing defects in excess of those permitted in the grade specified are permitted if such defects are to be covered by adjoining members or otherwise concealed.
  - b. "Custom grade" pieces shall be smoothly machined with top flat surfaces machine sanded. Depressed flat surfaces and molded contours shall be smoothly machined.
2. Carefully fit equipment to be installed into millwork. Provide filler pieces when required.
3. Protection: Exposed ends of millwork to be sealed with two coats of spar varnish. See Section 09900 - Paints and Coatings.

C. Plastic Laminate Work

1. Self edge tops with same grade of laminate as top surface unless indicated otherwise.
2. Counters and work tops with sinks: Apply trim and edging prior to surface sheet. Substrate for back splashes and at edges shall be trimmed lumber. Use only exterior grade or marine grade Plywood near wet areas. All adhesives used near water shall be formulated to be specially water resistant.

3. Apply veneers or plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Locate counter butt joints minimum 2 feet from sink cut-outs.
4. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces, where shown on Drawings.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Installation of all cabinetry and millwork items shall comply with the Quality Assurance section of this specification.
- B. Cabinetry and millwork items shall be mounted and set into place in accordance with the approved shop drawings. All work shall be straight, plumb, level and in true alignment. Fit all joints closely and fasten all pieces rigidly in place. Coordinate installation of cabinetry with Owner-provided items/appliance installations.
  1. Use threaded steel concealed joint fasteners to align and secure adjoining cabinet units and counter tops.
  2. Carefully scribe casework which is against other building materials, leaving gaps of 1/32 inch maximum. Do not use additional overly trim for this purpose.
  3. Secure cabinet and counter bases to floor using appropriate angles and anchorages.
  4. Countersink anchorage devices at exposed locations used to wall-mount components, and conceal with solid plugs of species to match surrounding wood. Finish flush with surrounding surfaces.
- C. All hardware shall be demonstrated to operate properly. Drawer units shall slide freely without bind. Doors shall remain open in any position beyond the closing mechanism of the hinges.

### 3.02 ADJUSTING AND CLEANING

- A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.
- B. Clean casework, counters, shelves, hardware, fittings and fixtures.
- C. Clean surfaces of plastic laminate with a damp cloth or ordinary bar soap and water. Harsh abrasive cleansers shall not be used. Stubborn dirt may be removed with lacquer thinner, methylethyl Ketone, contact adhesive solvents or cleaner waxes.

### 3.03 PROTECTION

- A. Completed installations shall be protected from damage until the Date of Substantial Completion. Cabinet work, millwork and other items damaged prior to Date of Substantial Completion shall be repaired or replaced at no expense to the Owner.

END OF SECTION





## SECTION 07100

### WATERPROOFING AND DAMPPROOFING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes but is not limited to the materials and installation of:
  - 1. Under slab vapor barrier.
  - 2. Air barrier building wrap.
  - 3. Waterproofing membrane installed at elevator pit slab and walls.
  - 4. Vapor barrier for insulated nail deck.

##### 1.02 RELATED SECTIONS

- A. Division 2: Installation of dampproofing membrane over prepared subgrade.
- B. Section 03300 - Cast-In-Place Concrete: Coordination of installation of dampproofing membrane under slabs-over-grade.
- C. Section 07464 - Fiber-Cement Trim and Soffit: Application of siding material over dampproofed and weather barrier sealed surfaces.
- D. Section 09250 - Gypsum Wallboard: Dampproofing applied over gypsum sheathing.

##### 1.03 SUBMITTALS

- A. Submit copies of complete technical data and application instructions shall be furnished to the Architect for approval in accordance with Section 01340.

#### PART 2 - PRODUCTS

##### 2.01 UNDER SLAB VAPOR BARRIER

- A. Dampproofing material below the building concrete slab-on-grade shall be Barrier-Bac, Product Number VB-350 as manufactured by Interplast Group of Livingston, New Jersey, or equal as approved by the Architect.
- B. Provide manufacturer's product warranty.

##### 2.02 AIR BARRIER BUILDING WRAP

- A. Weather Barrier Sheets: Nonwoven olefin sheet permeable to water vapor but not liquid water; ASTM E1677 Type I air retarder.
  - 1. Water Vapor Transmission: Minimum 10 perms when tested per ASTM E96, Procedure A.
  - 2. Flame Spread Rating: Maximum 25 per ASTM E84.
  - 3. Acceptable Products: DuPont "Tyvek CommercialWrap", or equal approved by the architect.
  - 4. As required by the manufacturer, provide all products and accessories required to qualify for the manufacturer's 10 year warranty.
- B. Sealing Tape, Flashing Tape: Types recommended by weather barrier manufacturer for Project applications.
  - 1. Acceptable Products: DuPont "Tyvek Tape", "FlexWrap", and "StraightFlash", or approved equal.
- C. Fasteners: Rust-resistant screws with 2-inch diameter plastic cap supplied by weather barrier manufacturer.
  - 1. Acceptable Product: DuPont "Tyvek Wrap Cap Screws", or approved equal.

- D. All accessories, including but not limited to tapes and fasteners, shall be as required by the weather barrier manufacturer. Any accessories not allowed by the weather barrier manufacturer, or that would void their warranty, shall not be used.
- E. Fasteners: DuPont Wrap Caps (or approved equal), 2" diameter plastic cap self-tapping screws.
- F. Warranty: Provide manufacturer's standard 10 year warranty for weather barrier. Conduct all meetings and inspections required by the manufacturer for the issuance of their 10 year warranty certificate. Provide manufacturer's standard warranties for all accessories.

#### 2.03 VAPOR BARRIER FOR INSULATED NAIL DECK

- A. 6 mil polyethylene vapor barrier installed over metal deck below insulated nail deck panels. See Section 07220.

#### 2.04 FLASHING AT FIBER CEMENT SIDING BUTT JOINT

- A. See Section 07600 – Flashing and Sheet Metal.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. Slab-Over-Grade: Install specified vapor barrier membrane over thoroughly compacted fill. Lap vapor barrier over footings and seal to foundation walls as applicable. Seal all joints with manufacturer's tape designed for this purpose. Seal all penetrations in accordance with membrane manufacturer's printed instructions. Membrane shall be laid in widest practical widths, lapped at least 6 inches and sealed at all pipes, conduit, etc. Any damage to the membrane prior to pouring of concrete slab shall be repaired with a vapor barrier patch, 6" larger on all sides than the damaged area. Seal patch with manufacturer-supplied tape.

#### 3.02 AIR BARRIER INSTALLATION

- A. Install air barrier over exterior side of exterior wall sheathing. Follow manufacturer's recommendations for installation.
  1. Install air barrier after sheathing is installed and before windows and doors are installed. Install lower level barrier prior to upper layers to ensure proper shingling of layers.
  2. Overlap air barrier at corners of building by a minimum of 12 inches.
  3. Overlap air barrier vertical seams by a minimum of 6 inches.
  4. Ensure barrier is plum and level with foundation, and unroll extending air barrier over window and door openings.
  5. Attach air barrier using specified fasteners with washers spaced at 12" to 18" on vertical stud line with framing.
  6. Prepare window and door rough openings as follows:
    - a. Prepare each window rough opening by cutting a modified "T" pattern in the air barrier.
    - b. Horizontally cut air barrier along bottom of header.
    - c. Vertically cut air barrier down the center of window openings from the top of the window opening down to 2/3 of the way to the bottom of the window openings.
    - d. Diagonally cut air barrier from the bottom of the vertical cut to the left and right corners of opening.
    - e. Fold side and bottom flaps into window opening and fasten every 6 inches. Trim off excess.
    - f. Prepare each rough door opening by cutting a standard "T" pattern in the air barrier.
    - g. Horizontally cut air barrier along bottom of door frame header and along top of sill.
    - h. Vertically cut air barrier down the center of door openings from the top of the door opening (header) down to the bottom of the door opening (sill).
    - i. Fold side flaps inside around door openings and fasten every 6 inches. Trim off excess.

7. Tape all horizontal and vertical seam of air barrier with DuPont Tyvek Tape (or approved equal).
8. Seal all tears and cuts in air barrier with DuPont Tyvek Tape (or approved equal).

END OF SECTION



SECTION 07210  
BUILDING INSULATION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation the insulation materials. Work includes but is not limited to the following:
  - 1. Batt insulation in framed walls.
  - 2. Batt insulation in framed roof areas.
  - 3. Slab perimeter insulation.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Coordination of the placement of the slab-on-grade concrete with the installation of the perimeter insulation.
- B. Section 04200 - Reinforced Unit Masonry: Substrate for rigid insulation board.
- C. Section 05400 - Cold Formed Metal Framing: Batt insulation installed between metal framing members.
- D. Section 06100 - Rough Carpentry: Batt insulation installed between wood framing members.
- E. Section 07100 - Waterproofing and Dampproofing
- F. Section 09250 - Gypsum Wallboard: Coordinate installation of insulation with installation of gypsum wallboard systems and gypsum sheathing.
- G. Section 09530 - Acoustical Treatment

1.03 QUALITY ASSURANCE

- A. Comply with fire-resistance, flammability and insurance ratings indicated, and comply with regulations as interpreted by governing authorities.

1.04 SUBMITTALS

- A. Submit copies of technical data describing each type of insulation to the Architect for review, in accordance with Section 01340.

1.05 PROTECTION OF MATERIALS

- A. Store insulation on the job site above ground in weathertight shelter and in manufacturer's original unopened bundles. Damaged and/or wet insulation and insulation that has been wet shall be immediately removed from the job site. Insulation must remain dry at all times.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Acceptable Manufacturers for Thermal Insulation:
  - 1. Manville Fiber Glass Division of Denver, Colorado.
  - 2. Owens-Corning Fiberglas Corp. of Toledo, Ohio.
  - 3. Certainteed of Dallas, Texas.
  - 4. The Dow Chemical Company of Midland, Michigan.
- B. Batt Insulation:
  - 1. Metal Framed Walls
    - a. 6" Thickness, R-19, unfaced, in widths suitable for friction fitting between metal framing members. Provide wire ties as required to hold insulation in place until the wall sheathing / gypsum wallboard is installed.
    - b. 8" Thickness, R-25, unfaced, in widths suitable for friction fitting between metal framing members.
    - c. 10" Thickness, R-30, unfaced, placed as shown in the drawings, on poultry wire in bottom chord of trusses. Install tightly fitted with no gaps.
- C. Slab Perimeter Insulation: Provide 1", R 5.0, of Dow Styrofoam SM Board.
- D. Poultry wire fabric of gauge required to support insulation; wire ties to fasten poultry wire to trusses and framing.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Wall and Ceiling Batt Insulation:
  - 1. Install with sides and ends tightly butted to form an effective thermal barrier. At metal framing, friction fit into place and wire tie as required to prevent displacement of the insulation when the gypsum systems are installed. Where nailing flange cannot be utilized, provide fire-resistant netting or hexagon wire mesh to retain insulation between framing members.
  - 2. Insulate behind cold side of all electrical outlet boxes, ductwork and piping at exterior walls. Butt all ends tightly together.
  - 3. Stuff insulation into all cracks around exterior doors and windows and closely-spaced framing members.
  - 4. At non-standard wide spaces, install insulation horizontally across framing space. Do not piece two vertical strips of insulation.
  - 5. Hold insulation back a minimum of 3" from items recessed in walls and ceilings, such as light fixtures and other heat generating appliances and electrical apparatus.
  - 6. At trusses, tie poultry wire tightly to truss and framing to prevent sagging.
- B. Slab Perimeter Insulation: Install at slab perimeter as detailed. Care shall be exercised to avoid displacement during placement of concrete floor slab. Coordinate installation with the installation of the slab vapor barrier.

### 3.02 CLEANUP

- A. Upon completion of the installation of insulation products, remove from the job site all excess debris, material and equipment.

END OF SECTION

SECTION 07220

ROOF INSULATION SYSTEM

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Nailable Insulated Roof Deck with wood substrate for roofing materials at pitched roofs to receive shingles.
- B. Polyisocyanurate rigid board type roof insulation(s) for thermal protection as part of low sloped roofing assemblies to receive single ply membrane roofing.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Rigid insulation installed over concrete roof structure.
- B. Section 05310 - Steel Deck: Insulated nail deck installed over steel deck.
- C. Section 07411 - Metal Roof and Wall Panels: Metal roof panels installed over insulated nail deck.
- D. Section 07530 - Single Ply Membrane Roof System: Membrane roof installed over rigid insulation.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with requirements of SBC Sections on Foam insulation.
- B. For installation conference requirements, see Section 01200 - Project Meetings.
- C. Installer shall demonstrate not less than five years' experience installing the brand and type materials and systems specified herein.
- D. Conduct pre-installation conferences, led by manufacturer's installation representative, as required under Section 01200 - Project Meetings.

1.04 SUBMITTALS

- A. Submit copies of technical data describing each type of insulation to the Architect for review, in accordance with Section 01340 - Submittals.
- B. Product Data: Submit manufacturer's product technical information.
- C. Samples
  - 1. Submit 6 by 6 inch samples of each board type required.
  - 2. Submit samples of each fastener type required.
- D. Shop Drawings
  - 1. Roof plan showing layout of boards, fastening patterns, ventilation, and roof edge details.
  - 2. Provide manufacturer's engineered fastener diagram and calculations.
- E. Certificates: Submit certificate from approved shingle manufacturer that shingles are warranted over insulation board.
- F. Thermal Warranty: Submit sample warranty indicating conditions and limitations.

#### 1.05 DELIVERY, STORAGE AND HANDLING

- A. Comply with general requirements specified in Section 01600.
- B. Deliver insulation in packages labeled with material name, thermal value, and product code.
- C. When stored outdoors, stack insulation on pallets above ground or roof deck and cover with tarpaulin or other suitable waterproof coverings.

#### 1.06 PROJECT CONDITIONS

- A. Comply with insurance underwriter's requirements applicable for products of this Section.
- B. Do not install insulation on roof deck when water of any type is present. Do not apply roofing materials when substrate is damp or wet.

### PART 2 - PRODUCTS

#### 2.01 NAILABLE INSULATED ROOF DECKING PANELS

- A. Atlas Roofing Corporation: ACFoam CrossVent, or approved equal.
- B. Provide roof board insulation from a single manufacturer.
- C. Cross Vent: Closed-cell HCFC free "Green" polyisocyanurate foam core board manufactured using HCFC blowing agent and bonded to 5/8 inch thick APA rated CDX Plywood with 1 inch ventilation spacing on top side and a fiber-reinforced felt facer on the bottom; FM Standard 4450/4470 approval I-60 for use with Class (A) shingles; compressive strength – 20 psi.
- D. Thickness
  - 1. Provide two layers of foam, of approximately equal thicknesses. See Part 3 of this section for installation instructions.
  - 2. First panel of foam board, second panel of foam with integral nail deck and vented channel.
  - 3. Total panel thickness shall provide R-value listed herein, AND shall be not less than 7" total thickness.
- E. R-Value: Minimum 30.
- F. UL Standard 263 Fire Resistance Classification (ASTM E119).
- G. Accessory Materials
  - 1. Fasteners: Factory Mutual approved.
  - 2. Base Ply: As recommended by membrane manufacturer.
  - 3. Fasteners: Cross Vent: Atlas Nail Base Fasteners.
  - 4. 6-mil. Polyethylene vapor barrier installed below foam board insulation panels.

#### 2.02 POLYISOCYANURATE RIGID INSULATION BOARD

- A. GAF Roofing Products: Energy Guard Polyisocyanurate tapered roof insulation, or approved equal.
  - 1. R-Value: Minimum 20.5
  - 2. Thickness: Minimum to provide R-value listed herein, AND not less than 3.5" thickness.
  - 3. Provide tapered insulation to provide roof slope as shown in the drawings.
- B. Provide roof board insulation, cants, and protection board from a single manufacturer.



- C. EnergyGuard (or approved equal): CFC & HCFC free Polyisocyanurate Rigid Insulation Board. 4' x 8' sheets, in thickness as shown in drawings, with compressive strength of 20 psi or greater.
- D. Accessories
  - 1. Cants: GAF EnergyGuard Perlite Cants (or approved equal).
  - 2. Crickets: GAF EnergyGuard Polyisocyanurate Tapered Rigid Insulation Board (or approved equal).
  - 3. Protection Board: GAF Perlite Recover Board (or approved equal); 1/2" thick; standard 4' x 8' sheets.
  - 4. Fasteners and Fastener Plates: As required to meet building code wind speed and uplift resistance.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine roof deck for suitability to receive insulation. Verify that substrate is dry, clean, and free of foreign material that would damage insulation or impede installation.
- B. Verify that nailers, equipment supports, vents and other roof accessories are secured properly and installed in conformance with Contract Drawings and submittals.
- C. Verify that deck is structurally sound to support installers, materials, and equipment without damaging or deforming work.
  - 1. Start of installation indicates installer accepts conditions of existing deck surfaces.

### 3.02 INSULATED NAIL DECK INSTALLATION

- A. Install polyethylene vapor barrier over metal roof deck, per the nail deck manufacturer's instructions.
- B. Install specified insulation using approved mechanical fasteners in accordance with manufacturer's latest written instructions and as required by governing codes and Owner's insurance carrier.
  - 1. Install the first layer of foam insulation board, fastened to the deck as required. Install in staggered pattern such that joints do not align.
  - 2. Install the second layer of foam board, with integral nail deck, in staggered pattern over the first layer of board. Joints shall not align with boards below. Fasten per the manufacturer's engineered fastening diagram.
  - 3. Fill valley and hip joints with expanding foam insulation or other method approved by the nail deck manufacturer.

### 3.03 RIGID INSULATION INSTALLATION

- A. Install insulation board and protection board with end joints staggered to avoid having insulation joints coinciding with joints in deck. In multi-layer installations, stagger joints in top and bottom layers. Install with slope as shown in the drawings.
- B. Install Cants, Crickets and Protection boards using approved mechanical fasteners in accordance with manufacturer's latest written instructions and as required by governing codes and Owner's insurance carrier.

### 3.04 CLEANING/PROTECTION

- A. Remove trash and construction debris from insulation surface prior to application of roofing membrane.
- B. Do not leave installed insulation exposed to the weather. Cover and waterproof with completed roof system immediately after installation.
  - 1. Temporarily seal exposed insulation edges at the end of each day.
  - 2. Remove and replace installed insulation that has become wet or damaged with new insulation.

- C. Protect installed insulation and roof cover from traffic with of protective covering materials during and after installation.
- D. Upon completion of the installation of insulation products, remove equipment and excess debris and material from the jobsite.

END OF SECTION

## SECTION 07270

### FIRESTOPPING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes materials and installation of the firestopping.
- B. Code Requirements: The intent and extent of firestopping work is described in governing Local and State Building Codes and Amendments thereto. Comply with all requirements of therein, except where more restrictive are described herein.
- C. Firestopping is required to prevent the passage of flame and products of combustion through concealed spaces and openings including, but not limited to, the following:
  - 1. Openings above fire-rated walls or partitions indicated to extend to underside of structure above ceilings.
  - 2. Openings in concealed furred spaces behind finished wall surfaces.
  - 3. Openings around pipes, conduits, ducts, and other construction passing through wall, floor and roof construction and fire-rated assemblies.
  - 4. Openings in locations that would permit the free travel of flame and products of combustion through fire-rated assemblies.
  - 5. Openings related to mechanical and electrical panels and systems, and all other construction that penetrates or in any other way interrupts fire-rated wall, floor and roof assemblies.

##### 1.02 QUALITY ASSURANCE

- A. Fire-Resistance Ratings: Provide products which have been tested in accordance with ASTM E 119 (or UL 263, ANSI A2.1 or NFPA 251) for fire resistance, and rated by UL or other industry-recognized agency for required resistances.
- B. Surface-Burning Ratings: Provide products which have been tested and listed by UL for required surface burning characteristics (flame spread, fuel contributed, smoke developed) in accordance with ASTM E 84.
  - 1. General Rating: Except as otherwise indicated, provide compete installations with maximum flame spread of 25.
- C. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience

##### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product specifications and installation instructions for each type of material and application method required. Submit data in accordance with Section 01340.
- B. Certified Test: For each material, submit certified test reports on performances including (as applicable) heat resisting and burning characteristics, densities, compressive strengths, and thermal insulating values.

##### 1.04 SEQUENCING AND COORDINATION

- A. Integrate the scheduling/coordination of work of this section with other units of work so that this work will not be damaged, will be installed prior to installation of enclosing or concealing work, and will be installed as soon as practicable.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Ceramic-Fiber and Mastic Coating: Ceramic fibers in bulk form formulated for use with mastic coating, and ceramic fiber manufacturer's mastic coating. Subject to compliance with requirements, manufacturers offering specified items which may be incorporated in the work include the following:
1. FireMaster Bulk and FireMaster Mastic, by Thermal Ceramics; Augusta, Georgia.
  2. Nelson FSB Bulk, by Nelson Firestop Products; Tulsa, Oklahoma.
- B. Intumescent Wrap Strips: Single-component, elastomeric sheet with aluminum foil on one side. Subject to compliance with requirements, manufacturers offering specified items which may be incorporated in the work include the following:
1. Dow Corning Fire Stop Intumescent Wrap Strip 2002, by Dow Corning Corporation; Midland, Michigan.
  2. CP643/642 Firestop Collar, by Hilti Construction Chemicals, Inc.; Tulsa, Oklahoma.
  3. Fire Barrier FS-195 Wrap/Strip, by 3M Fire Protection Products; St. Paul, Minnesota.
  4. Nelson FRS Wrapstrip, by Nelson Firestop Products; Tulsa, Oklahoma.
- C. Silicone Foams: Two-component, silicone-based liquid elastomer that, when mixed, expands and cures in place to produce a flexible, nonshrinking foam. Subject to compliance with requirements, manufacturers offering specified items which may be incorporated in the work include the following:
1. Dow Corning Fire Stop Foam 2001, by Dow Corning Corp.; Midland, Michigan.
  2. Pensil 200 Foam, by General Electric Co.; Waterford, New York.
- D. Silicone Sealants - Subject to compliance with requirements, manufacturers offering specified items which may be incorporated in the work include the following:
1. Dow Corning Firestop Sealant 2000, by Dow Corning Corp.; Midland, Michigan.
  2. Dow Corning Firestop Sealant SL 2003, by Dow Corning Corp.; Midland, Michigan.
  3. Pensil 100 Firestop Sealant, by General Electric Co.; Waterford, New York.
  4. FS-ONE Intumescent Firestop Sealant, by Hilti Construction Chemicals, Inc.; Tulsa, Oklahoma.
  5. Metacaulk 835, by the RectorSeal Corporation; Houston, Texas.
  6. Fyre-Sil, by Tremco Inc.; Beachwood, Ohio.
  7. Fyre-Sil S/L, by Tremco Inc.; Beachwood, Ohio.
  8. Nelson CLK Non-Sag Sealant, by Nelson Firestop Products; Tulsa, Oklahoma.
  9. Nelson CLK Self-Leveling Sealant, by Nelson Firestop Products; Tulsa, Oklahoma.
- E. Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealant of grade indicated below:
1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces and nonsag formulation for openings in vertical and other surfaces requiring a nonslumping / gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.
  2. Grade for Horizontal Surfaces: Pourable (self-leveling) grade for openings in floors and other horizontal surfaces.
  3. Grade for Vertical Surfaces: Nonsag grade for openings in vertical and other surfaces.
- F. Firestopping Putty: Where an outlet box is installed in a rated assembly (1 and 2 hour) with an outlet box on the opposite side within 24 inches, both boxes shall be protected with firestopping putty per the manufacturer's instructions. Only the following firestopping putty pad materials are acceptable:
1. MPP-4S by 3M; St. Paul, Minnesota.
  2. FSP by Nelson Firestop Products; Tulsa, Oklahoma.
  3. SpecSeal by Specified Technologies; Somerville, New Jersey.
  4. CP617 Firestop Pad, by Hilti Construction Chemicals, Inc.; Tulsa, Oklahoma.

- G. Mineral Fiber Safing Insulation: Provide manufacturer's standard felted semi-rigid board of nonasbestos mineral fibers plus binders, rated noncombustible (ASTM E 136), listed and labeled by UL, and listed in UL Designs similar to applications indicated.
  - 1. Acceptable Products/Manufactures: Thermafiber, LLC (United States Gypsum) "Thermafiber Safing Insulation".
  - 2. Thermal: K-value at 75 F of 0.25.
  - 3. Thickness: 4" unless indicated otherwise, and not less than the thickness required to obtain required fire-rating.
  - 4. Fire Safing Density: Nominal 4 lb./cu. ft.
- H. Mineral Wool: Loose mineral wool, rated noncombustible (ASTM E 136), free of asbestos fiber and glass fiber, suitable for stuffing into metal deck flute openings above steel structural members, to an in-place density of 6 to 12 lbs. per cu. ft.
- I. Accessories: For each application provide manufacturer's standard board-anchorage system complying with related UL Design, and as indicated.

## PART 3 - EXECUTION

### 3.01 INSPECTION AND PREPARATION

- A. Examine substrates and conditions under which work is to be performed, and correct all unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Architect.
- B. Review required firestopping with governing authority (building official). Before proceeding with installation, obtain approval of thicknesses and installation methods, including extension of typical details for coverage of non-typical locations.

### 3.02 INSTALLATION

- A. General
  - 1. Comply with manufacturer's instructions for particular conditions of installation in each case. Consult with manufacturer's technical representative for conditions not covered by printed instructions.
  - 2. Provide firestopping material and number of layers as required to provide indicated ratings (hours of fire endurance protection). Where not otherwise indicated, comply with UL Designs as required by governing regulations. In multiple-layer work, offset joints by 6".
  - 3. Anchor firestopping to substrate with manufacturer's recommended anchorage system and in compliance with UL Designs. Space anchors and anchor supports (if any) as indicated by applicable.
    - a. Selection of Anchorage system in Contractor's option where not otherwise indicated; comply with applicable UL Designs.
  - 4. Install firestopping without gaps and voids. Do not use damaged materials. Remove and replace misfitted work.
  - 5. Install fire resistance sealant to seal around penetrations through fire rated assemblies.

### 3.03 COORDINATION AND PROTECTION

- A. Coordinate installation of firestopping with other work to minimize cutting into or removal of installed firestopping by other trades. As trades successively compete installations which have been damaged or removed. Maintain complete coverage of full thickness in locations to be protected.
- B. Protection: Installer of firestopping shall advise Contractor of protection requirements for work, which will ensure that his work will be without damage or deterioration at time of substantial completion of project. Provide protection from harmful exposures. Repair or replace work which has been damaged.

END OF SECTION



## SECTION 07411

### METAL ROOF AND WALL PANELS

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Materials and installation of metal roof panels and wall panels.
- B. Mechanically-seamed, standing seam metal roof panels, with related metal trim and accessories.
- C. Concealed fastener, vertically oriented metal wall panels.

##### 1.02 RELATED REQUIREMENTS

- A. Section 05440 - Cold-Formed Metal Trusses: For cold-formed metal trusses supporting roof decking and metal panels.
- B. Section 07100 - Waterproofing and Dampproofing: For roofing underlayment over roof deck, and below metal panels.
- C. Section 07600 - Flashing and Sheet Metal: For formed sheet metal flashings, and roof drainage items in addition to items specified in this Section.
- D. Section 07920 - Sealants and Caulking: Field-applied joint sealants not specified in this section.

##### 1.03 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA): [www.aamanet.org](http://www.aamanet.org):
  - 1. AAMA 621 - Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) & Zinc-Aluminum Coated Steel Substrates.
  - 2. AAMA 809.2 - Voluntary Specification Non-Drying Sealants.
- B. American Society of Civil Engineers (ASCE): [www.asce.org/codes-standards](http://www.asce.org/codes-standards):
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- C. ASTM International (ASTM): [www.astm.org](http://www.astm.org):
  - 1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - 2. ASTM A 755 - Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
  - 3. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
  - 4. ASTM A 980 - Standard Specification for Steel, Sheet, Carbon, Ultra High Strength Cold Rolled.
  - 5. ASTM C 645 - Specification for Nonstructural Steel Framing Members.
  - 6. ASTM D 1003 - Standard Test Method for Haze and Luminous Transmittance of Transparent Plastics.
  - 7. ASTM D 2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.
  - 8. ASTM D 4214 - Test Methods for Evaluating Degree of Chalking of Exterior Paint Films.
  - 9. ASTM E 1514 - Standard Specification for Structural Standing Seam Steel Roof Panel Systems.
  - 10. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.
  - 11. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

12. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.
13. ASTM E 1980 - Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces.

D. FM Global (FM): [www.fmglobal.com](http://www.fmglobal.com):

1. ANSI/FM 4471 - Approval Standard for Class 1 Panel Roofs.

E. International Accreditation Service (IAS):

1. IAS AC 472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems, Part B.

F. Underwriters Laboratories, Inc. (UL): [www.ul.com](http://www.ul.com):

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies

#### 1.04 REQUIREMENTS

A. Preinstallation Meeting: Prior to erection of framing, conduct preinstallation meeting at site attended by Owner, Architect, manufacturer's technical representative, inspection agency and related trade contractors.

1. Coordinate building framing in relation to metal panel system.
2. Coordinate openings and penetrations of metal panel system.
3. Coordinate work from other Divisions related to the installation of the roof panels.

#### 1.05 QUALITY ASSURANCE

A. Manufacturer/Source: Provide metal roof panel assembly and accessories from a single manufacturer providing fixed-base roll forming, and accredited under IAS AC 472 Part B.

B. Manufacturer Qualifications: Approved manufacturer listed in this Section with minimum five years experience in manufacture of similar products in successful use in similar applications.

1. Substitutions submitted in accordance with Section 01600 will be considered by the Architect.
2. Approved manufacturers must meet separate requirements of Submittals Article.

C. Installer Qualifications: Experienced Installer certified by metal panel manufacturer with minimum of five years experience with successfully completed projects of a similar nature and scope.

1. Installer's Field Supervisor: Experienced mechanic certified by metal panel manufacturer supervising work on site whenever work is underway.

#### 1.06 ACTION SUBMITTALS

A. Submit copies of complete technical data and physical samples to the Architect in accordance with Section 01340.

B. Product Data: Manufacturer's data sheets for specified products.

C. Shop Drawings: Show layouts of metal panels. Include details of each condition of installation, panel profiles, and attachment to building. Provide details at a minimum scale 1-1/2-inch per foot of edge conditions, joints, fastener and sealant placement, flashings, openings, penetrations, roof accessories, lightning arresting equipment, and special details. Make distinctions between factory and field assembled work.

1. Indicate points of supporting structure that must coordinate with metal panel system installation.
2. Include data indicating compliance with performance requirements.
3. Include structural data indicating compliance with requirements of authorities having jurisdiction.

D. Samples for Initial Selection: For each exposed product specified including sealants. Provide representative color charts of manufacturer's full range of colors.



- E. Samples for Verification: Provide 12-inch- (305 mm-) long section of each metal panel profile. Provide color chip verifying color selection.
- F. Product Test Reports: Indicating compliance of products with requirements, witnessed by a professional engineer.
- G. Qualification Information: For Installer firm and Installer's field supervisor.
- H. IAS Accreditation Certificate: Indicating that manufacturer is accredited under provisions of IAS AC 472.
- I. Manufacturer's Warranty: Sample copy of manufacturer's standard warranty.

#### 1.07 CLOSEOUT DOCUMENTS

- A. Provide closeout documents in accordance with Sections 01700 and 01720.
- B. Manufacturer's Warranty: Executed copy of manufacturer's standard warranty.

#### 1.08 DELIVERY, STORAGE, AND HANDLING

- A. Protect products of metal panel system during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage. Protect panels and trim bundles during shipping.
  - 1. Deliver, unload, store, and erect metal panel system and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.
  - 2. Store in accordance with Manufacturer's written instructions. Provide wood collars for stacking and handling in the field.

#### 1.09 COORDINATION

- A. Coordinate with installation of the gutters and aluminum cross.

#### 1.10 WARRANTY

- A. Manufacturer's 30 Year Warranty for panels finished with 70% Fluoropolymer coating. On manufacturer's standard form, in which manufacturer agrees to repair or replace metal panel assemblies that fail in materials and workmanship within one year from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURER

- A. Basis of Design Manufacturer: MBCI Metal Roof and Wall Systems, Division of NCI Group, Inc.; Houston TX. Tel: (877)713-6224; Email: info@mbc.com; Web: www.mbc.com.

#### 2.02 PERFORMANCE REQUIREMENTS

- A. General: Provide metal roof panel system meeting performance requirements as determined by application of specified tests by a qualified testing facility on manufacturer's standard assemblies.
- B. Radiative Property Performance
  - 1. Solar Reflectance Index: Minimum 78 for roof slopes of 2:12 or less and 29 for roof slopes greater than 2:12 under medium wind conditions, per ASTM E 1980.
- C. System Performance: Comply with ASTM E 1514 and requirements of this Section.

- D. Structural Performance: Provide metal panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated:
  - 1. Structural criteria shown in the structural drawings or specifications shall be considered the minimum standards. Where the standards or criteria here differ from those shown in the structural drawings and specifications, the most stringent shall be required.
  - 2. Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.
    - a. Wind Uplift Testing: Certify capacity of metal panels by actual testing of proposed assembly per ASTM E 1592.
  - 3. Snow Loads: See the structural drawings and specifications.
  - 4. Deflection Limits: Withstand inward and outward wind-load design pressures in accordance with applicable building code with maximum deflection of 1/240 of the span with no evidence of failure.
  - 5. Seismic Performance: Comply with ASCE 7, Section 9, "Earthquake Loads."
- E. Wind Uplift Resistance: Comply with UL 580 for wind-uplift class UL-90.
- F. FM Approvals Listing: Comply with FM Approvals 4471 as part of a panel roofing system, and that are listed in FM Approvals' "RoofNav" for Class 1 construction. Identify materials with FM Approvals markings.
  - 1. Fire/Windstorm Classification: Class 1A-90
  - 2. Hail Resistance Rating: SH.
- G. Air Infiltration, ASTM E 1680: Maximum 0.09 cfm/sq. ft. (0.457 L/s per sq. m) at static-air-pressure difference of 6.24 lbf/sq. ft. (300 Pa).
- H. Water Penetration Static Pressure, ASTM E 1646: No uncontrolled water penetration at a static pressure of 12 lbf/sq. ft. (575 Pa).
- I. Thermal Movements: Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction. Allow for deflection and design for thermal stresses caused by temperature differences from one side of the panel to the other.

### 2.03 METAL ROOF PANELS

- A. Mechanically-seamed, Concealed Fastener, Metal Roof Panels: Structural metal roof panel consisting of formed metal sheet with vertical ribs at panel edges, installed by lapping and mechanically interlocking edges of adjacent panels, and attaching panels to supports using concealed clips and fasteners in a weathertight installation.
  - 1. Basis of Design: MBCI, SuperLok, [www.mbc.com/superlok.html](http://www.mbc.com/superlok.html).
    - a. Nominal Coated Thickness: 24 gage minimum, or as required to prevent oil-canning.
    - b. Panel Surface: Smooth with no striations in pan.
    - c. Exterior Finish: Signature 300, with 70% Fluoropolymer two-coat system.
    - d. Color: As selected by Architect from manufacturer's standard colors.
  - 2. Panel Width: 16 inches (406 mm).
  - 3. Panel Seam Height: 2 inch (50.8 mm).
  - 4. Joint Type: Mechanically seamed.

### 2.04 METAL ROOF PANEL ACCESSORIES

- A. General: Provide complete metal roof panel assembly incorporating trim, copings, fasciae, gutters and downspouts, and miscellaneous flashings, in flat, smooth finish. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet.

- C. Panel Clips: Provide panel clip of type specified, at spacing indicated on approved shop drawings.
  - 1. Two-piece Floating: ASTM C 645, with ASTM A 653/A 653M, G90 (Z180) hot-dip galvanized zinc coating, configured for concealment in panel joints, and identical to clips utilized in tests demonstrating compliance with performance requirements.
    - a. Provide clips as required for attachment to insulated nail deck.
- D. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by roof panel manufacturer. Exposed fasteners are not allowed.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
  - 1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
  - 2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
- F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.
- G. Roof Accessories: Approved by metal roof panel manufacturer.

#### 2.05 METAL WALL PANELS

- A. Concealed Fastener, Metal wALL Panels: Structural metal panel consisting of formed metal sheet with integral fastening system at panel edges, installed by lapping and mechanically interlocking edges of adjacent panels, and attaching panels to supports using concealed clips and fasteners in a weathertight installation.
  - 1. Basis of Design: MBCI, MasterLine 16, [www.mbc.com/superlok.html](http://www.mbc.com/superlok.html).
    - a. Nominal Coated Thickness: 22 gage minimum, or as required to prevent oil-canning.
    - b. Panel Surface: Smooth.
    - c. Exterior Finish: Signature 300, with 70% Fluoropolymer two-coat system.
    - d. Color: As selected by Architect from manufacturer's standard colors.
  - 2. Panel Width: 16 inches (406 mm).
  - 3. Panel Orientation: Vertical
  - 4. Joint Type: Concealed

#### 2.06 METAL WALL PANEL ACCESSORIES

- A. General: Provide complete metal panel assembly incorporating trim, closures, and miscellaneous materials, in flat, smooth finish. Provide required fasteners, closure strips, thermal spacers, splice plates, support plates, and sealants as indicated in manufacturer's written instructions.
- B. Flashing and Trim: Match material, thickness, and finish of metal panel face sheet. Provide standard shapes and shapes shown in the drawings.
- C. Panel Clips: Provide panel clip of type specified, at spacing indicated on approved shop drawings.
  - 1. Provide clips as required for attachment to metal furring channels or other backup shown in the drawings.
- D. Panel Fasteners: Self-tapping screws and other acceptable fasteners recommended by panel manufacturer. Exposed fasteners are not allowed.
- E. Joint Sealers: Manufacturer's standard or recommended liquid and preformed sealers and tapes, and as follows:
  - 1. Factory-Applied Seam Sealant: Manufacturer's standard hot-melt type.
  - 2. Tape Sealers: Manufacturer's standard non-curing butyl tape, AAMA 809.2.
- F. Steel Sheet Miscellaneous Framing Components: ASTM C 645, with ASTM A 653/A 653M, G60 (Z180) hot-dip galvanized zinc coating.
- G. Other Accessories: Approved by metal roof panel manufacturer.

## 2.07 FABRICATION

- A. General: Provide factory fabricated and finished metal panels and accessories meeting performance requirements, indicated profiles, and structural requirements.
- B. Fabricate metal panel joints configured to accept factory-applied sealant providing weathertight seal and preventing metal-to-metal contact and minimizing noise resulting from thermal movement.
- C. Form panels in continuous lengths for full length of detailed runs, except where otherwise indicated on approved shop drawings.
- D. Sheet Metal Flashing and Trim: Fabricate flashing and trim to comply with manufacturer's written instructions, approved shop drawings, and project drawings. Form from materials matching metal panel substrate and finish.

## 2.08 FINISHES

- A. Finishes, General: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
- B. Fluoropolymer Two-Coat System: 0.2 – 0.3 mil primer with 0.7 - 0.8 mil 70 percent PVDF fluoropolymer color coat, AAMA 621.
  - 1. Basis of Design: MBCI, Signature 300.

## 2.09 ROOF UNDERLAYMENT

- A. Metal Panel Underlayment, over entire roof deck, below panels: Moisture Guard Plus, by Tamko Building Products of Joplin, MO.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Inspect wood decking prior to installation of underlayment. Correct all defects that would produce an uneven substrate for installation of the metal panels or compromise the underlayment.
- B. Examine metal panel system substrate and supports with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal panel installation.
  - 1. Inspect metal panel support substrate to determine if support components are installed as indicated on approved shop drawings. Confirm presence of acceptable supports at recommended spacing to match installation requirements of metal panels.
  - 2. Panel Support Tolerances: Confirm that panel supports are within tolerances acceptable to metal panel system manufacturer but not greater than the following:
    - a. 1/4 inch (6 mm) over any single roof plane.
- C. Correct out-of-tolerance work and other deficient conditions prior to proceeding with insulated metal roof panel system installation.

### 3.02 PREPARATION

- A. Miscellaneous Supports: Install miscellaneous panel support members according to ASTM C 754 and manufacturer's written instructions.
- B. Flashings: Install flashings to cover exposed underlayment per Section 07600 "Flashing and Sheet Metal".

### 3.03 METAL PANEL INSTALLATION

- A. Metal Panel Underlayment: Install specified self-adhering underlayment per the manufacturer's instructions. Install over entire roof deck, shingle fashion beginning at the eave and working to the ridge. Overlap per the manufacturer's requirements.
- B. Mechanically-Seamed, Standing Seam Metal Roof Panels: Install weathertight metal panel system in accordance with manufacturer's written instructions, approved shop drawings, and project drawings. Install metal roof panels in orientation, sizes, and locations indicated, free of waves, warps, buckles, fastening stresses, and distortions. Anchor panels and other components securely in place. Provide for thermal and structural movement.
- C. Attach panels to supports using clips, screws, fasteners, and sealants recommended by manufacturer and indicated on approved shop drawings.
  - 1. Fasten metal panels to supports with concealed clips at each location indicated on approved shop drawings, with spacing and fasteners recommended by manufacturer.
  - 2. Seamed Joint: Crimp standing seams with manufacturer-approved, motorized seamer tool so clip, metal roof panel, and factory-applied sealant are completely engaged.
  - 3. Provide weatherproof jacks for pipe and conduit penetrating metal panels of types recommended by manufacturer.
  - 4. Dissimilar Materials: Where elements of metal panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

### 3.04 ACCESSORY INSTALLATION

- A. General: Install metal panel trim, flashing, and accessories using recommended fasteners and joint sealers, with positive anchorage to building, and with weather tight mounting. Provide for thermal expansion. Coordinate installation with flashings and other components.
  - 1. Install components required for a complete metal panel assembly, including trim, copings, flashings, sealants, closure strips, and similar items.
  - 2. Comply with details of assemblies utilized to establish compliance with performance requirements and manufacturer's written installation instructions.
  - 3. Provide concealed fasteners except where noted on approved shop drawings.
  - 4. Set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently weather resistant.
- B. Joint Sealers: Install joint sealers where indicated and where required for weathertight performance of metal panel assemblies, in accordance with manufacturer's written instructions.
  - 1. Prepare joints and apply sealants per requirements of Section 07600 – Flashing and Sheet Metal, or as otherwise specified in this section, or required by the manufacturer to achieve the required watertight roof system described in this section.

### 3.05 CLEANING AND PROTECTION

- A. Remove temporary protective films immediately in accordance with metal roof panel manufacturer's instructions. Clean finished surfaces as recommended by metal roof panel manufacturer.
- B. Replace damaged panels and accessories that cannot be repaired to the satisfaction of the Architect.

END OF SECTION



SECTION 07464

FIBER-CEMENT SIDING, TRIM AND SOFFITS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of fiber cement siding, trim and soffit.

1.02 RELATED SECTIONS

- A. Section 05400 - Cold Formed Metal Framing: Metal framing required for the installation and support of the fiber cement products.
- B. Section 06100 - Rough Carpentry: Wood framing and blocking required for the installation and support of the fiber cement products.
- C. Section 07600 - Flashing and Sheet Metal: Applicable portions of Section 07600 apply to this Section as if repeated herein. Flashings installed in conjunction with the fiber cement elements.
- D. Section 07920 - Sealants and Caulking: Sealant installed in conjunction with the fiber cement elements for weathertight installations.
- E. Section 09900 - Painting: Surface preparation and finish painting of siding, soffit, and trim materials.
- F. Section 10210 - Building Louver: Building louvers installed in conjunction with the fiber-cement elements.

1.03 QUALITY ASSURANCE

- A. Preliminary Installation Conference: As soon as possible after award of fiber-cement work, meet with the fiber-cement board installer, installer of substrate construction (sheathing board) and other work adjoining siding system, including penetrating work and windows; the Architect; the Owner; and representatives of other entities directly concerned with performance of siding system.
  - 1. Review requirements of the Contract Documents, submittals, status of coordinating work and availability of materials and installation facilities; establish preliminary installation schedule. Review requirements for inspections, testing, certifications, forecasted weather conditions, governing regulations and proposed installation procedures.
  - 2. Record discussion, including agreement or disagreement on matters of significance; furnish copy of recorded discussions to each participant.
  - 3. Discuss siding system protection requirements for construction period extending beyond siding system installation.
  - 4. If meeting ends with substantial disagreements, determine how disagreements will be resolved and set date for reconvened meeting.
- B. Pre-Installation Conference: Approximately 2 weeks before scheduled commencement of siding system installation and associated work, meet at project site with installer; installer of each component of associated work; installers of sheathing material; installers of window units and other work in and around the siding which must precede or follow the siding work; the Architect; the Owner; siding system manufacturer's representative; and other representatives directly concerned with performance of the work.
  - 1. Record in writing discussions, decisions, and agreements (or disagreements) reached at conference; furnish copy of report to each entity attending.

2. Review foreseeable methods and procedures related to the siding work.
3. Tour representative areas of siding substrates; inspect and discuss condition of substrate and other preparatory work performed by other trades.
4. Review siding system requirements (drawings, specifications, and other Contract Documents). Ensure installation method and techniques are in full compliance with manufacturer's requirements and that all warranties will apply.
5. Review required submittals, both completed and yet to be completed.
6. Review and finalize construction schedule related to the siding work; verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
7. Review weather and forecasted weather conditions, as well as procedures for coping with favorable conditions.

#### 1.04 SUBMITTALS

- A. Submit manufacturer's product data and complete installation details and requirements to the Architect for review. Show relationships to actual materials and substrates. Indicate fasteners, fastener types and spacings for each type installation.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Ship, receive and store materials in a flat, dry condition. Protect materials for the elements and the intrusion of foreign materials.

#### 1.06 WARRANTY

- A. Installer's Warranty: Provide 2-year warranty protecting against faulty installation, coverings materials and installation.
- B. Manufacturer's Warranty: Provide manufacturer's standard 50-year warranty, guaranteeing that the fiber cement products not to crack, rot, or delaminate.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Manufacturer: James Hardie Building Products, Inc. of Mission Viejo, California, or equal as approved by the Architect.
- B. Siding
  1. Lap Siding: Hardiplank Lap Siding, smooth finish with PrimePlus factory primer, 5/16" thickness by 6-1/4" wide, installed with a 5" exposure.
- C. Soffit: Hardisoffit, smooth finish with PrimePlus factory primer. Provide width(s) to suit project conditions.
- D. Trim: Harditrim, smooth finish with PrimePlus factory primer, in sizes noted on drawings.
- E. Joint Flashing behind butt joints in fiber cement siding:
  1. 6" tall, prefinished aluminum flashing. Color selected by the Architect.
  2. Premanufactured flashing with integral leg for hanging on planks. Fully coated to prevent reaction with fiber cement siding.
  3. Products/Manufacturers:
    - a. XtremeTrim Plank Flash by Tamlyn of Stafford, Texas
    - b. Junction Flashing by Simplicity Tool Corp, of Portland Oregon



## 2.02 ACCESSORIES

### A. Fasteners

1. Fasteners for all fiber cement installation conditions shall be self-tapping, hardened 400 series Stainless Steel. Fastener type(s) shall be as recommended by the fiber cement products manufacturer.
  - a. Self-tapping bugle head screws with nibs for clearing countersink for siding and soffit.
  - b. Self-tapping trim head screws for trim. Pre-drill all holes in trim.

### B. Building Wrap: Refer to Section 07100.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Verify that substrate is ready to receive the fiber cement items. Verify that all support framing is in place and is dimensionally correct. Install sheathing in accordance with Section 09250. Apply dampproofing material and building wrap in accordance with Section 07100.
- B. Coordinate siding, soffit, and trim installations with adjoining work on which this work is in any way dependent for its proper installation.
- C. Follow the manufacturer's printed instructions furnished with each carton of siding material. If instructions are not furnished with the product, obtain them from the manufacturer before proceeding with installation.
- D. Lap Siding
  1. Install a 1/4" thick treated wood starter strip at the bottom course of the wall. Leave occasional gaps at ends of starter strips for drainage.
  2. Install siding with 1-1/4" lap, and exposure hereinbefore specified.
  3. Vertical joints shall always be placed over framing or solid wood blocking.
    - a. Install manufacturer-provided metal joiner where such blocking and/or framing cannot be installed where vertical joints occur.
    - b. All joints shall be true and plumb.
    - c. Maintain moderate contact at plank butt joints. Do not apply caulk or sealant to butt joints.
    - d. Maintain 1/8" width joint between siding planks. Seal joint with approved sealant.
    - e. Where planks are cut to length, prime per manufacturer's instructions.
  4. Install Plank Flashing behind joints, per the manufacturer's instructions.
  5. Stagger joints in succeeding courses a minimum of 48".
  6. Blind fastening only shall be allowed, per the manufacturer's instructions. Face-fastening and pin-backs shall not be allowed.
  7. Comply with fiber-cement product manufacturer's recommendations and printed instructions for installation and flashing of all items.
  8. Cut panels back from all openings and stops to allow for expansion and contraction. Distance of cut shall be as recommended by the siding manufacturer.
  9. All fasteners shall be driven snug with the surface of the siding plank.
- E. Fiber Cement Trim
  1. Install trim in locations shown in the drawings.
  2. Trim corners shall be pre-built prior to installation on the framing.
  3. All horizontal joints in running trim and corner boards shall be 45 degree weather cut. Maintain 12" minimum separation between weather cuts at corners. Where boards are cut, prime as required by the manufacturer.

4. Trim at windows and doors shall be installed as shown in the drawings, in the fashion recommended by the manufacturer.
5. Pre-drill holes for anchoring with trim-head screws.
6. Fasteners for pre-built corners shall be 1/2" from edges of board, and 16" maximum apart.
7. Fasteners for attaching trim to framing shall be 3/4" from the edges, and 2" from the ends, and 16" maximum apart.
8. Horizontal boards at base of wall, above openings, etc., where siding is installed above, shall have flashing over the trim as shown in the drawings and manufacturer's instructions.
9. Trim at the base of wall shall have flashing below as shown in the drawings and manufacturer's instructions.
10. All fasteners in trim shall be driven shy of the face. Holes shall be sanded and filled with a wood putty compatible with fiber cement siding, then re-sanded prior to painting.

END OF SECTION

## SECTION 07530

### SINGLE PLY MEMBRANE ROOF SYSTEM

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. All equipment, labor, materials required for the installation of the roof insulation and fully-adhered membrane roof system. System shall include but not be limited to:
  - 1. Substrate preparation.
  - 2. Insulation.
  - 3. Roof membrane.
  - 4. Membrane flashings.
  - 5. Accessories required for a complete and weathertight installation.
  - 6. Lava boxes.

##### 1.02 RELATED SECTIONS

- A. Concrete: Concrete decks as substrate for roof system.
- B. Section 06100 - Rough Carpentry: Treated wood blocking and nailers required for the complete roof system installation. Comply with roof membrane manufacturer's requirements for type of wood treatment compound. Roof system installed over decking and insulation.
- C. Section 07600 - Flashing and Sheet Metal: Coordination of installation of related metal flashings.

##### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data, installation instructions, and recommendations for each type of roofing product required. Include data substantiating that materials comply with requirements.
- B. Shop Drawings: Submit complete shop drawings showing roof configuration and sheet layout, installation details and special conditions. Submit layout drawings showing taper system, installation diagrams and installation instructions and details.
- C. Samples
  - 1. Roof Membrane: Submit 12-inch-square samples of finished roofing sheets, including "T-shaped" side/end lap seams, as applicable.
  - 2. Insulation: Submit 12-inch-square samples.

##### 1.04 QUALITY ASSURANCE

- A. Installer Qualifications: This roofing system must be installed by an authorized applicator.
  - 1. Installer certification: Obtain written certification from manufacturer of primary materials certifying that installer is approved by manufacturer for installation of specified roof system. Provide copy of certification to the Architect prior to award of roofing work.
- B. Installer Field Supervision: Installer must maintain full-time supervisor/foreman on project site during times in which roofing work is in progress. Supervisor must have a minimum of 5 years' experience in roofing work similar in nature and scope to the specified roofing.

- C. Substrate Observation: Once the roof deck has been installed and the deck is ready to receive the roof insulation (the roof deck exposed), the Architect must be notified in order for him to visually observe the condition of the substrate prior to installation of any roof system components. Items/materials installed without such Architect's observation must be removed.
- D. U.L. Listing: Provide roof system and component materials which have been tested for application and slopes indicated and which are listed by Underwriters Laboratories Inc. (UL) for Class A external fire exposure.
  - 1. Provide roof covering materials bearing UL Classification marking on bundle, package, or container indicating that materials have been produced under UL's Classification and Follow-up Service.
- E. Wind Loading (Uplift): Provide roof system conforming with Factory Mutual Engineering Corporation Roof Assembly Classification, I-90 Construction.
- F. Upon completion of the installation, an inspection shall be conducted by a technical representative of the roofing manufacturer to ascertain that the roofing system has been installed according to the manufacturer's most current published specifications and details and for warranty issuance.

#### 1.05 PROJECT CONDITIONS

- A. Weather Conditions Limitations: Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendations and warranty requirements.
- B. Exposed roof decks shall be protected from rain, ice, frost, contaminants, etc., to allow the roof insulation and roof membrane to be installed over a solid, dry, uncontaminated substrate.

#### 1.06 PRODUCT HANDLING

- A. Deliver materials to project site in original, tightly sealed containers or unopened packages, with manufacturer's labels intact.
- B. Store materials in weather-protected environment, clear of ground and moisture.
  - 1. Protect foam plastic insulation from direct sunlight exposure.

#### 1.07 GUARANTEE

- A. The General Contractor, in conjunction with the authorized Roofing Contractor and the manufacturer of materials used, shall provide written warranty, agreeing to replace/repair defective materials and workmanship as required to maintain completed roofing system in watertight condition.
- B. Warranty shall cover, at no cost to the Owner, all labor and materials required to repair or replace roofing, flashing, sheet metal, copings, and metal work against leaks or faulty workmanship. All costs for any of the above shall be absorbed by the General Contractor primarily, and his Roofing Contractor and materials manufacturer secondarily.
- C. Warranty period shall be 15 years after date of Substantial Completion for labor and material with an additional five-year warranty (total of 20 years) on membrane material.
- D. System shall be warranted for all requirements specified, including for wind uplift as required under factory mutual classifications specified.

## 1.08 INSTALLER'S WARRANTY SIGNS

- A. Furnish and install a roof warranty sign, 10" x 12" (minimum) size, made of .040" aluminum painted gloss white with black lettering.
- B. Sign Shall Read: DO NOT MAKE REPAIRS, PENETRATIONS OR ALTERATIONS TO THIS ROOF without the written approval from the Owner or authorized representative of the owner. The roof is maintained until (insert month and fifteen years after Date of Substantial Completion) by (insert Contractor's name, address and telephone number).
- C. Permanently post sign where directed by the Owner's representative, prior to submission of, and as a condition for, final invoice and subsequent payment.

## PART 2 - PRODUCTS

### 2.01 SINGLE PLY ROOFING MEMBRANE

- A. Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.
- B. Fully Adhered System, EPDM Membrane
  - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work shall be one of the following:
    - a. Firestone Building Products: RubberGard EPDM system, Fully adhered.
    - b. Johns Manville: "EPDM Adhered" system.
    - c. Carlisle: Sure-Seal EPDM system, Fully adhered.
    - d. Substitutions for equal product will be considered by the Architect. Refer to Section 01600.
- C. Membrane: EPDM Membrane shall be Firestone RubberGard EcoWhite Platinum EPDM - supplied in .090 mil, white, of standard sizes up to 10 feet in width and 100 feet in length, or the longest sheet possible, as required by each installation. The roof membrane shall consist of the following:
  - 1. Flashing: Shall be minimum .060" thickness, EPDM elastomer with factory applied adhesive backing, or field applied adhesive applied, as recommended by the manufacturer.
  - 2. Joint Tape: Same material as membrane with adhesive or clean surface for solvent joint adhesion, as recommended by the membrane manufacturer.
  - 3. Sealant: As recommended by the membrane manufacturer.
  - 4. Bonding Adhesive: Shall be compatible with substrate materials to which the membrane is to be adhered, as recommended by manufacturer.
  - 5. Lap and Water Stop Sealant: Shall be gun or trowel consistency for use in sealing flashing edges, as recommended by manufacturer.
  - 6. Pourable Sealer: Compatible with materials with which it is used, as recommended by manufacturer.
  - 7. Night Seal: Compatible with materials with which it is used, as recommended by manufacturer, to seal work in progress when inclement weather occurs or is expected.
  - 8. Splice Wash: Material recommended by manufacturer.
  - 9. Other Materials: Furnish other materials not shown or specified required for complete and proper installation of roof system, as recommended by the roofing manufacturer.
  - 10. Sheet Seaming System: Manufacturer's standard materials for sealing lapped joints, including edge sealer to cover exposed spliced edges as recommended by manufacturer of roof system.
  - 11. Tapered Edge Strips and Flashing Accessories: Types recommended by manufacturer of roof system material, provided at locations indicated and at locations recommended by manufacturer., including adhesive tapes, flashing cements, and sealants.
  - 12. Membrane Adhesive: As recommended by membrane manufacturer for particular substrate and project conditions, formulated to withstand min. 60 psf uplift force, or as required by the building code.
  - 13. Molded Pipe Seals: Factory molded pipe seals with stainless steel clamps. Site as required for all roof pipe penetrations. Color shall be white.

14. Expansion Joint: See Section 05800 - Expansion Control.

## 2.02 ROOF INSULATION

A. Thermal Roof Insulation: See Section 07220 for materials.

## PART 3 - EXECUTION

### 3.01 PREPARATION OF SUBSTRATE

- A. General: Comply with manufacturers' instructions for preparation of substrate to receive the roof membrane system.
- B. Clean substrate of dust, debris, and other substances detrimental to the roof membrane system work. Remove sharp projections. Do not apply sheet roofing to damp, frozen, dirty, dusty, or deck surfaces unacceptable to manufacturer. Roof surface shall be free of ponded water, ice, or snow.
- C. Install flashings, and accessory items as shown, and as recommended by manufacturer even though not shown.
- D. Prime substrate where recommended by manufacturer of materials being installed.
- E. Prevent compounds from entering and clogging drains and conductors, and from spilling or migrating onto surfaces of other work.

### 3.02 INSPECTION

- A. The Contractor shall be responsible for providing a proper substrate to receive the roofing system. Installation shall not proceed until substrate has been observed by the Architect.
- B. Substrate shall have positive drainage and shall be verified by Contractor prior to installation of new materials.
- C. Surface joints shall be less than 1/4" wide. All joints wider than 1/4" must be repaired with proper materials.
- D. Verify that drains, sleeves, scuppers, and curbs which pass through surfaces to receive roofing are rigidly installed and approved/accepted by roof installer.
- E. Surfaces to receive new materials shall be as required by manufacturer to ensure a proper bond.
- F. Verify that surfaces are free of cracks, depressions, waves, or projections which may be detrimental to successful installation. Remove foreign materials
- G. Starting work of this Section means acceptance of substrate and site conditions.

### 3.03 INSTALLATION - GENERAL

- A. Comply with the instructions and recommendations of the roofing materials manufacturer, except to the extent more stringent requirements are indicated.
- B. Confinement of Materials: Do not allow fluid and plastic materials to spill or migrate beyond surfaces of intended application, or to flow into drains, conductors, or ceilings below.
- C. Performance: It is required that roofing work be watertight for normal weather exposures, and not deteriorate in excess of manufacturer's published limitations.

- D. Nailers must be pressure-treated wood with salt preservatives. Creosote and asphaltic preservatives are not acceptable.
  - 1. Attachment of the wood nailers must be accomplished by using approved fasteners providing no less than 125 lbs. of pullout resistance and spaced no greater than 24" o.c. and equal in thickness to the added insulation and no less than 3 1/2" wide or as required by the roof system manufacturer.

#### 3.04 INSTALLATION OF ROOF INSULATION

- A. The insulation shall be installed mechanically-fastened to deck according to the roofing manufacturer's recommendations. Mechanical fasteners shall penetrate into the decking as required by Factory Mutual and manufacturer of roofing materials. Install directly over the prepared roof deck. Ends and sides shall be tightly butted, with butted joints flush and even. Comply with manufacturer's shop drawings for taper layout.
- B. The insulation must be independently attached to the prepared substrate using approved fasteners and insulation plates. Fasten all insulation per manufacturer's detailed shop drawings. All fasteners must pass the requirements established by Factory Mutual 4470 for corrosion resistance.
- C. Stagger joints in boards and between layers. Butt units tightly together and against wood blocking and nailers; trim to fit penetrations and interruptions, so that gaps between units and between insulation and adjacent construction do not exceed 1/4 inch. Fasteners shall be spaced a maximum of 2'-0" o.c., and there shall be one fastener installed at each and every corner of each board, and in addition, the pattern of fasteners shall conform to specified requirements for wind uplift. For roof tapers, comply with shop drawings for location and directions of taper utilizing specified perlite board; install over thermal insulation board.
- D. Do not install more insulation each day than can be covered with membrane before stopping work at end of day or before onset of inclement weather.
- E. Trim insulation or provide preshaped units at drains to provide positive slope for 24 inches around drain.
- F. Shape insulation or provide preformed units to provide crickets, saddles, and tapered areas as indicated or as required to provide drainage. Taper insulation around all roof drains and projections to ensure proper drainage.

#### 3.05 MEMBRANE INSTALLATION

- A. Comply with membrane manufacturer's instructions for handling, laying, seaming, and securing membrane.
- B. Edges of roofing shall be sealed at the end of each day's work and if inclement weather is expected during the work period.
- C. Any wrinkles found greater than 1" high and wrinkles that impede the flow of water, must be cut laid flat and patched over using the specified roof membrane and standard welding /seaming procedures.
- D. Night Seal: At the completion of each day's work, temporarily seal any loose edge of membrane with the specified night seal. Care must be used to guarantee that no water flows beneath any completed sections of roof. Night Seal must be cut out and discarded prior to resumption of work.

#### 3.06 WALKWAYS

Not used.

#### 3.07 EXPANSION JOINT COVERS

- A. Install expansion joint covers in conjunction with the roof membrane system. Flash flange at cant into roof system utilizing membrane flashing provided as a component of the roof membrane system. Attach to wall using fasteners and spacing as indicated on Drawings. Fasteners shall be non-corrosive.

### 3.08 PROTECTING ROOFING

- A. After completing roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner, describing nature and extent of deterioration or damage found.
- B. Ensure roof is completely clean of any debris or construction materials.
- C. Repair or replace (as required) deteriorated or defective work found at the time of Substantial Completion Inspection to a condition free of damage and deterioration.

### 3.09 DEFECTIVE WORK

- A. Refinish or remove and replace insulation surfaces not acceptable to receive roofing or where physical properties do not meet specified requirements.

END OF SECTION



## SECTION 07600

### FLASHING AND SHEET METAL

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes but is not limited to the materials, fabrication, and installation of:
  - 1. Sheet metal work.
  - 2. Roof area related flashings, including reglets.
  - 3. Prefinished flashings and copings.
  - 4. Prefinished gutters and downspouts, and Splashblocks.
  - 5. Prefinished rake and eave flashings.
  - 6. Thru wall flashings.
  - 7. Fiber Cement Siding Plank Flashing
  - 8. Other items as required to complete the Work.

##### 1.02 RELATED SECTIONS

- A. Section 04200 - Reinforced Unit Masonry: Thru-wall flashings installed in conjunction with the erection of the concrete unit masonry.
- B. Section 04210 - Brick Masonry: Thru-wall flashings installed in conjunction with the erection of the brick masonry.
- C. Section 06100 - Rough Carpentry: Treated wood nailers and blocking for attachment of flashing and sheet metal items.
- D. Section 07411 - Metal Roof and Wall Panels: Flashings installed in conjunction with roof and wall panels.
- E. Section 07464 - Fiber-Cement Siding Trim and Soffit: Flashings installed in conjunction with fiber-cement siding.
- F. Section 07530 - Single Ply Membrane Roof System: Materials and installation of related flashings.
- G. Section 08640 - Aluminum Clad Windows and Doors: Flashings installed in conjunction with the window and door installations for weathertight installations.

##### 1.03 QUALITY ASSURANCE

- A. All flashing shall be installed as indicated on drawings. All flashings, including flashings not particularly shown, but required for finish work shall be furnished and installed in strict accordance with Sheet Metal and Air Conditioning Contractors National Association recommendations. Where not otherwise shown, all exposed (exposed to view) flashing shall be 12 oz. copper-plus unless otherwise noted on drawings. Roof area flashing not exposed to view shall be .040 aluminum or 12 oz. copper-plus, as shown on drawings.

##### 1.04 SUBMITTALS

- A. Submit detailed shop drawings on items requiring fabrication and manufacturer's technical data on manufactured products. Submittals shall indicate materials, finish, installation techniques and required anchoring devices. Comply with Section 01340. For gutters and downspouts, show material thickness, profiles, anchorage technique and gutter bracket size and spacings. Comply with Section 01340.

## 1.05 GUARANTEES

- A. Guarantee all flashings to remain weathertight for a period of two (2) years.
- B. Finish Warranty: Provide 10-year manufacturer's standard written warranty for finish applied to sheet metal items.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Flashing Materials
  - 1. Sheet aluminum for non-site-exposed roof area flashing shall be natural aluminum color, alloy 3003-H14 and in 10'-0" lengths, minimum. All sheet aluminum shall be marked by the manufacturer with an indelible ink stamp indicating the name of the manufacturer, alloy and temper of each sheet.
  - 2. Flashing noted to be prefinished shall be fabricated from prefinished aluminum, 3003 alloy, thickness as required by the girth dimension in accordance with SMACNA, but not less than .040" thick, smooth surface and Kynar 500 full strength Fluoropolymer finish, colors as selected by Architect. Provide shapes as detailed.
  - 3. Copper step flashing and other roof flashing exposed to view, one of the following:
    - a. 16 oz. per sq. ft. (0.0216 inch thick) ASTM B370, tempered as required for forming.
    - b. 0.0216" thick Copper Plus, copper-stainless alloy.
  - 4. Aluminum flashing behind lapsiding butt joints: Aluminum Plank Flashing by Tamlyn. Prefinished color selected by Architect.
- B. Vent Pipe Flashings and Gas and Fluid-Bearing Pipe Flashings - Single Ply Membrane Roof System: Comply with the requirements of the single ply membrane roof system manufacturer; refer to Section 07530.
- C. Vent Pipe Flashings at Shingle Roof: Refer to Section 07311.
- D. Gutters and Downspouts - Finish shall be Kynar 500 full strength fluoropolymer in colors as selected by the Architect. Provide thickness of material as required by SMACNA for the girth of the gutters and downspouts to ensure no oil-canning.
  - 1. Gutters: Minimum thickness aluminum determined by girth of the installed material in accordance with SMACNA requirements to ensure no oil-canning, profile and size as shown on Drawings. Provide with factory-applied finish applied to roll stock prior to fabrication of gutters. Provide color matched gutter flashing and 1/8"x1" wide prefinished downspout strap brackets, finished to match gutters.
  - 2. Downspouts: Minimum thickness aluminum determined by girth of the installed material in accordance with SMACNA requirements to ensure no oil-canning, profile and size as shown on Drawings. Provide with factory-applied finish applied to roll stock prior to fabrication of downspouts. Provide prefinished 0.060" thickness, color-coordinated support straps for anchorage of the downspouts to the structure.
  - 3. Refer to drawings for gutter and downspout shapes and sizes.
  - 4. Gutter Hangers: Stainless Steel "Hidden Hanger" as manufactured by Old World Gutter, [www.oldworldgutter.com](http://www.oldworldgutter.com), (502) 639-3964, or equal. Rod shall be fastened to roof deck below shingles, using stainless steel screws.
  - 5. Splash Blocks: 12" x 24" x 3-1/2", precast concrete; 8,000 psi minimum compressive strength; wire reinforced. One splash block at each downspout.
- E. Joint Flashing behind butt joints in fiber cement siding:
  - 1. 6" tall, prefinished aluminum flashing. Color selected by the Architect.
  - 2. Premanufactured flashing with integral leg for hanging on planks. Fully coated to prevent reaction with fiber cement siding.
  - 3. Products/Manufacturers:
    - a. XtremeTrim Plank Flash by Tamlyn of Stafford, Texas
    - b. Junction Flashing by Simplicity Tool Corp, of Portland Oregon

- F. Strippable film required on all prefinished items, including flashings. There will be no exceptions to this requirement.
- G. Accessories
  - 1. Washers: Type suited to material being attached.
  - 2. Nails for fastening aluminum shall be aluminum alloy 6061-T6 or cadmium plated stainless steel, alloy Type 305 of wide flathead type and shall be of sufficient length to secure sheet metal firmly in place.
  - 3. Screws, bolts, and nuts for fastening aluminum shall be aluminum alloy 6061-T6 or cadmium plated stainless steel, alloy Type 305.
  - 4. Expansion inserts shall be lead or plastic.
  - 5. Aluminum filler for welding aluminum shall be 1100 alloy.
  - 6. Flashing cement shall be Owens-Corning Asphalt Plastic Cement, Federal Specification SS-C-153, Type 1.
  - 7. Reglets: Aluminum, similar to Fry Reglet Corporation of Alhambra, California. Provide type and profile required for the installation requirements and the substrate involved.
- H. Thru-wall flashing over lintels, shelf angles, beams, at sills, weeps, window heads, bed joints of exterior walls and elsewhere indicated on the drawings shall be one of the following:
  - 1. Copper: 16 oz. per sq. ft. (0.0216 inch thick) ASTM B370, tempered as required for forming.
  - 2. 0.0216" thick Copper Plus, copper-stainless alloy.

## PART 3 - EXECUTION

### 3.01 FABRICATION

- A. Form sheet metal items in bending brake. Pre-form in shop where practical. Prime under sides of all sheet metal with asphalt primer before installing. Install with care to assure clean, true and even lines.
- B. Make all joints watertight. Seams in flashing which cannot be effectively locked shall be welded (welding permitted only on items not designated to be pre-finished). Oxy-gas welding in which paste fluxes are used shall be done in the shop. Copper flashing shall be soldered.
- C. Fabricate sheet metal items in maximum 10' lengths, with straight runs maximum 20' long, joining pieces with locked seams. Join units with loose-lock seams filled with elastic cement as expansion joint.
- D. Welding: Field welding shall be by gas tungsten arc or gas metal arc process only.

### 3.02 CONDITION OF SURFACES

- A. Check surfaces to which flashings and trim are to be applied. Verify whether surfaces are smooth, properly prepared and have adequate provisions for fastening metal into position.
- B. Surfaces to be covered with sheet metal shall be free from defects of every description. Clean of dirt, rubbish, and other foreign materials before sheet metal work is started. Drive projecting nails flush.

### 3.03 INSTALLATION

- A. Exposed edge of all flashing shall be bent back at least 1/2". Cap Flashing shall lap over base flashing as shown on drawings. Flashing joints shall be 3" loose-lock slip joints filled with elastic cement, or soldered as noted on drawings.
- B. Seams: All seams, except required welded seams, shall be loose lock seams. All seams shall be made in the direction of flow. Loose lock seams shall be loose flat lock seams and shall be completely filled with sealant. Seams shall conform to the following requirements:
  - 1. Flat Lock seams shall finish not less than 3/4" wide.

2. Plain Lap seams shall lap not less than 3".
  3. Cross Folded Seams: Where sheet metal is folded in one direction and then folded at right angles to the first fold, as for example the slip joint of base flashings, expansion joints and similar cross folded joints, the folded portion of the sheet metal at the cross fold shall be split and a patch of sheet metal shall be welded over the split to avoid binding at the cross fold.
- C. Reglets: Reglets shall have ends of each length forming a lap slip joint. Reglets shall provide continuous grooves nominal 1/4" at throat, horizontal depth minimum of 1-1/8" with provision for anchoring upturned edge of flashing.
- D. Rake and Eave Flashings: Install rake flashings over roof underlayment. Install eave flashings under roof underlayment. Extend back from the edge of the roof a minimum of 3". Nail into place using roof nails specified in Section 07311, spaced at 8" o.c. Coordinate installation of the rake and eave flashings with the installation of the roof underlayment and roof shingles. Refer to drawings and Section 07311 for additional requirements.
- E. Gutters and Downspouts
1. Anchor gutters, using specified hangers, at 32" centers maximum. Space closer if required to prevent oil canning.
  2. Support downspouts, using specified straps, at 48" centers. Anchor to wall structure using non-corrosive, anchorages.
- F. Electrolysis: All sheet metal subject to electrolytic / corrosion action shall be fully protected by approved insulating coatings against dissimilar metals.
- G. Flashing of Masonry Work
1. Build in concealed flashing in masonry work at, or above, all shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. At lintels and support angles, adhere flashing to steel using plastic adhesive recommended by flashing manufacturer. Between masonry courses, place masonry on a bed of mortar and cover with mortar to cushion flashing from abrasion by masonry. Seal penetrations in flashing with plastic adhesive before covering with mortar.
  2. Seal between flashing and backup, and mechanically fasten flashing to backup. Ensure edges of flashing are smooth and do not tear or puncture weather barrier.
  3. Extend flashings laterally the full length of lintels and shelf angles plus a minimum of 4" into masonry each end. Terminate ends of flashing in preformed boot and seal with lap adhesive. At heads and sills, turn up ends of boot not less than 2".
- H. All flashing and related metal work shall be installed in a manner to produce a neat appearance and shall be completely watertight.

### 3.04 CLEANING AND PROTECTION

- A. Cleaning: After installation, all flashing shall be thoroughly cleaned and rinsed with potable water.
- B. Protection
1. Protect metal flashing from damage, stains, etc. during the progress of the Work. Damaged flashing shall be replaced at no additional expense to the Owner.
  2. Remove peel strip from prefinished materials just prior to Substantial Completion Inspection.

END OF SECTION

SECTION 07920  
SEALANTS AND CAULKING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of the sealants and caulking.

1.02 RELATED SECTIONS

- A. Section 04200 - Reinforced Unit Masonry: Construction of control joints and expansion joints.
- B. Section 04210 - Brick Masonry: Construction of control joints and expansion joints.
- C. Section 06200 - Finish Carpentry: Sealant installed at perimeter of exterior wood door frames.
- D. Section 06415 - Cabinetry and Millwork: Caulking installed between cabinet/countertop splash and wall.
- E. Section 08100 - Hollow Metal Doors and Frames: Sealant installed at perimeter of door frames.
- F. Section 08210 - Wood Doors: Sealant installed at perimeter of door framing.
- G. Section 08305 - Access Doors: Sealant installed at perimeter of door framing.
- H. Section 08640 - Aluminum Clad Windows and Doors: Sealant installed at perimeter of window and door framing.
- I. Section 09300 - Tile: Sealant installed in floor and wall control and expansion joints.
- J. Section 09900 - Painting: Installation of sealant coordinated with painting.

1.03 SUBMITTALS

- A. Submit copies of complete technical data and physical samples to the Architect in accordance with Section 01340.
- B. Submit a detailed list of all locations where materials will be used, type of caulking or sealants which will be used at each location, and names of all manufacturers of compounds, primers, and fillers which will be used.
- C. Submit certification that the sealant to be installed is compatible with and is approved for installation with the exterior insulation and finish system to be installed.
- D. Substitutions submitted in accordance with Section 01600 will be considered.

1.04 PUBLICATIONS

- A. Copies of all technical bulletins relating to the installation of the various materials shall be on the job site at all times during the installation of all caulking and sealants. Workmen will be thoroughly familiar with these and the instructions therein shall be followed exactly.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Sealants for all exterior locations, except horizontal traffic joints, and at interior locations where color coordination is required, shall be:
  - 1. Between Other Materials and at Perimeter of Door and Window Framing at Building Façade: Dow-Corning 795.
  - 2. Provide primer and bond breaker as recommended by the sealant manufacturer for the substrates involved.
  - 3. Colors shall be as selected by the Architect from the manufacturer's standard colors.
  - 4. Non-silicon sealants will not be allowed as substitutes for this item.
- B. Sealants for control joints in brick veneer shall be BASF MasterSeal NP100 or equal. Color by Architect.
- C. Sealant for horizontal installation over the expansion joints in hard tile and concrete surfaces, interior and exterior, shall be self-leveling, Dow-Corning S-L traffic sealant. Colors as selected by the Architect.
- D. Caulking at the interior of the building for joints where the caulking will be painted shall be Tremco Acrylic Latex #384, white in color.
- E. Sealant for installation between counter tops and splashes, between walls and splashes shall be Dow Corning 786 Mildew Resistant silicone sealant.
- F. Sealant for use with copper flashing shall be as recommended by copper supplier.
- G. Back-up materials for sealants and caulking shall be closed cell Dow Ethofoam as manufactured by Dow Chemical Company, Inc. Back-up materials shall have a diameter of approximately 25% to 50% greater than the width of the joint.
- H. Solvents, primers and cleaning agents as recommended by the caulking and sealant manufacturers.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Caulking and sealants application shall include, but is not limited to the following:
  - 1. Joints in building facade
  - 2. Perimeter of door frames.
  - 3. Perimeter of aluminum window framing system.
  - 4. Control joints.
  - 5. Joints in walks, slabs, floor tile and all other traffic bearing surfaces.
  - 6. Counter tops and splashes at wall.
  - 7. Between dissimilar materials.
  - 8. Under thresholds.
  - 9. At areas to prevent the entrance of moisture.
  - 10. Other areas as detailed on the drawings.
- B. Inspect the work of other trades prior to installation of caulking and sealants. Install no caulking nor sealant in joints which are not in proper condition to receive sealant materials until defects are corrected.
- C. Apply sealants and caulking when temperatures are as a recommended by the manufacturers. Storage of all material shall be at room temperature with material being used on a first in, first out basis.

- D. Prior to the installation of any caulking or sealants, completely clean all surfaces. All surfaces must be dry. Clean first with brush and dry cloth and then clean with an air brush using dry, oil-free air. Immediately after cleaning, prime, as required, the surfaces to be treated with the appropriate primer using a small clean paint brush reaching all parts of the area to be primed. Allow primer the proper drying time before applying the caulking or sealant.
- E. All caulking and sealants applied to the building will be installed with guns having the proper size nozzles. Use even pressure, sufficient to fill all voids and joints solid.
- F. A bed of sealant compound shall be spread over the entire seat of thresholds and the thresholds set on the compound.
- G. Joints in exterior facade shall be tooled slightly concave.
- H. Joints to be painted shall be even and smooth. Caulking that is to be painted shall be installed before the last coat of paint is applied.
- I. Sealant to be installed over horizontal expansion joints shall be installed after area is cleaned and primed as outlined above. Pour sealant from container, fill joint to slightly below the top of the paving. Minimum depth of the joint shall be 1/2 inch.
- J. Install backer rods in joints more than 1/2 inch deep, of size and type specified. Rod shall be set for approximately 1/2 inch depth of compound.
- K. Every caulked and sealed joint shall be watertight.

### 3.02 CLEANUP

- A. Upon completion of the work, all excess materials shall be removed leaving joints, neat, clean and straight. Cured material shall be removed by cutting with a sharp edged tool. Thin films may be removed by abrading, but without damaging the finish of any other materials.

END OF SECTION





SECTION 08100

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes all hollow metal (steel) doors and frames and hollow metal work.

1.02 RELATED SECTIONS

- A. Section 04210 - Brick Masonry: Hollow metal work erected in conjunction with the erection of the brick masonry.
- B. Section 05400 - Cold Formed Metal Framing: Metal framing for the support of the hollow metal work.
- C. Section 06100 - Rough Carpentry: Treated wood blocking required for the rigid installation of the hollow metal work.
- D. Section 06200 - Finish Carpentry: Wood casings surrounding metal frames.
- E. Section 07920 - Sealants and Caulking: Caulking installed at perimeter of door frames.
- F. Section 08210 - Wood Doors: Wood doors installed in hollow metal frames.
- G. Section 08710 - Finish Hardware: Preparation of hollow metal work to receive finish hardware items.
- H. Section 08800 - Glass and Glazing: Glass and glazing installed in hollow metal work.
- I. Section 09900 - Painting: Finish painting of hollow metal work.

1.03 QUALITY ASSURANCE

- A. Hardware Locations: The locations of hardware on doors and frames shall be in accordance with the requirements of The National Association of Architectural Metal Manufacturers (NAAMM), The Steel Door Institute (SDI) and the Americans with Disabilities Act (ADA).
- B. Manufacturer's Standards: Comply with Steel Door Institute ANSI/SDI 100 (ANSI Publication A250.8-1998), "Recommended Specifications, Standard Steel Doors and Frames".
- C. Acceptable manufacturers: The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
  - 1. Ceco Door Division of Oakbrook Terrace, Illinois.
  - 2. Amweld Building products, LLC of Garrettsville, Ohio.
  - 3. Curries Company of Mason City Iowa.
  - 4. Fenestra Corporation of Erie, Pennsylvania.
  - 5. Republic Builders Products of McKenzie, Tennessee.
  - 6. Steelcraft Manufacturing Corporation of Brentwood, Tennessee.
- D. Acoustical qualities: Doors shall have a minimum sound transmission classification of 29 as tested under ASTM E-90-61T.

E. Regulatory Approvals

1. Underwriter Laboratories (U.L.):
  - a. All labeled fire doors and frames shall be of a type which has been investigated and tested in accordance with U.L. and shall be constructed to meet Procedure No. R-3791, as listed by Underwriters Laboratories.
  - b. Underwriters Laboratories labeled doors and frames shall provide the degree of fire protection, heat transmission and panic loading capability indicated by the opening class.
  - c. A physical label shall be affixed to all Underwriters' Laboratories classified fire doors, listed fire door frames and frames as evidence of compliance with procedures of the labeling agencies.
2. Fire-Rated Door Assemblies: Units that comply with NFPA 80 are identical to door and frame assemblies tested for fire-test-response characteristics per ASTM E 152, and are labeled and listed by UL, Warnock Hersey, or another testing and inspecting agency acceptable to authorities having jurisdiction.
3. Opening assemblies shall meet the requirements of NFPA 105 Hot Smoke Test.

1.04 REFERENCES

- A. SDI - Steel Door Institute Publications SDI105 through 128
- B. ANSI Publication A250.8-1998 (formerly SDI 100)
- C. ANSI Publication A250.4-1994
- D. ANSI Publication A250.6-1994
- E. ANSI Publication A250.10-1998
- F. ANSI/DHI A115 Series Publications
- G. ANSI/DHI Publication A115.1G-1994
- H. NFPA 80 - Standard for Fire Doors and Windows

1.05 SUBMITTALS

- A. Submit copies of shop drawings and door and frame schedules to the Architect in accordance with Section 01340.
  1. The Shop Drawings shall fully describe and locate all items being furnished and shall include large scale details of principal construction features. Indicate glazing requirements and glazing stop details.
  2. Door and frame schedule shall make reference to door numbers and room numbers shown and scheduled on the drawings.
  3. Fabrication shall not commence until the submittals have been approved in writing by the Architect.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Doors shall be received at the job site in the manufacturers original, unopened cartons. All scratches and disfigurements caused in shipping and handling shall be properly cleaned and touched up with a rust-inhibitive primer.
- B. Doors shall have all wrappings removed. Doors shall be stored in a dry location, in a vertical position, spaced by blocking to permit air circulation between them.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Hot-Rolled Steel Sheets: ASTM A 569, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- B. Cold-Rolled Steel Sheets: ASTM A 366, Commercial Steel (CS), or ASTM A 620, Drawing Steel (DS), Type B; stretcher-leveled standard of flatness.
- C. Electrolytic Zinc-Coated Steel Sheet: ASTM A 591, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher-leveled standard of flatness where used for face sheets.

### 2.02 SHOP PAINTING

- A. Apply a primed finish to all ferrous metal surfaces furnished under this Section. Clean and chemically treat metal surfaces to assure maximum paint adherence. Follow with a dip or spray coat of rust-inhibitive metallic oxide, zinc chromate, or synthetic resin primer on all exposed surfaces. Finished surfaces shall be smooth and free from irregularities and rough spots.

### 2.03 FLUSH HOLLOW METAL DOORS

- A. General: Fabricate steel door units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site.
- B. All exterior swing-out doors shall have the top and bottoms closed to eliminate moisture penetration. Door tops shall not have holes or openings.
- C. Hollow Metal Doors
  - 1. Interior Doors: SDI-100, Grade II, heavy-duty, Model 3, with minimum 18 gauge steel face sheets with a stretcher level degree of flatness.
    - a. Flush Door
      - (1) Thickness: 1-3/4"
      - (2) Seamless design.
    - b. Cores: Per ANSI A250.8
      - (1) Doors shall be reinforced, stiffened, sound deadened and insulated with impregnated Kraft honeycomb core completely filling the inside of the doors and laminated to inside faces of both panels using contact adhesive applied to both panels and honeycomb core.
  - 2. Exterior Doors: SDI-100, Grade III, extra-heavy-duty, Model 3, with a minimum 16 gauge hot-dipped galvanized (A-60) steel face sheets with a stretcher level degree of flatness.
    - a. Flush Door
      - (1) Thickness: 1-3/4"
      - (2) Seamless design.
    - b. Exterior doors shall be fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C 236 or ASTM C 976 on fully operable door assemblies. Provide thermal-rated assemblies with U-factor of 0.24 or better. Doors shall be mill phosphatized for paint adhesion.

### 2.04 DOOR FABRICATION

- A. Workmanship: The finished work shall be rigid, neat in appearance, and free from defects; form molding members straight and true with joints coped or mitered, well formed and in true alignment. All welded joints on exposed surfaces shall be dressed smooth so they are invisible after finishing.

- B. Door Sizes and Clearances: Doors shall be of type, sizes, and design indicated. The clearances for doors shall be 1/8" at jambs and heads and 3/4" at bottom, unless indicated or specified otherwise. Clearances at meeting edges of pairs of doors shall be 1/4".
- C. Provisions for Hardware: Mortise, reinforce, drill, and tap doors at factory to receive all mortise-type hardware. Provide reinforcing only for doors to receive surface-applied hardware, except push plates and kick plates; drilling and tapping for surface-applied hardware will be done in the field. Provide metal reinforcing plates for surface-applied hardware as required. The gauges of metal for reinforcing plates shall comply with manufacturer's recommendation for the type of hardware used and the size and thickness of doors, provided that the minimum requirements are as follows:
  - 1. Hinge Reinforcement: 3/16 Inch
  - 2. Strike Reinforcement: 11 Gauge
  - 3. Closers and Bracket Reinforcement: 12 Gauge
  - 4. Mortise Covers: 26 Gauge
  - 5. The gauges used shall not be lighter than those required by Commercial Standard CS 242-62.
- D. Doors with labels shall carry Underwriters label on the door and on the frame. They shall be constructed to meet Procedure No. R-3791 and R-3821, as listed by Underwriters Laboratories.
- E. Glass Moldings and Stops
  - 1. Where scheduled, doors shall be provided with hollow metal moldings to secure the specified glazing (refer to Section 08800 for glazing).
  - 2. Fixed moldings shall be welded to the door on the security side. Loose stops with butt corners shall be provided. Stops shall be either snap-on or screwed into place with cadmium or zinc coated countersunk screws.

## 2.05 HOLLOW METAL FRAMES

- A. General: Fabricate steel frame units to comply with ANSI A250.8 and to be rigid, neat in appearance, and free from defects including warp and buckle. Where practical, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory assembled before shipment, to assure proper assembly at Project site. Conceal fastenings, unless otherwise indicated.
- B. Location and Type: All metal frames for doors shall be formed of steel to sizes and shapes indicated. Frames shall be fabricated with continuously welded corners. Knock-down frames shall not be allowed. Frames shall be furnished with Underwriters Laboratories label, as required, at the place of manufacturer.
- C. Type and Gauges of Metal: Metal for frames shall be cold-rolled or hot-rolled, pickled and oiled, steel sheets with clean, smooth surfaces.
  - 1. Interior Frames of 16 gauge thick steel unless indicated otherwise. Steel frames shall have a stretcher level degree of flatness.
  - 2. Exterior Frames of 16 gauge thick steel unless indicated otherwise. Exterior frames shall be hot-dipped galvanized (A60) with a stretcher level degree of flatness.
  - 3. Drywall Frames: Drywall frames shall be the same as flush frames except that frames shall be formed with double return backbends to prevent cutting into drywall surface.
- D. Workmanship and Design: The finished work shall be strong and rigid, neat in appearance, and free from defects. Fabricate members straight and true with corner joints well-formed, in true alignment and fastenings concealed where practicable.
- E. Forming Corner Joints: Joints for welded-type frames shall be mitered and continuously arc-welded for full depth and width of frame and trim. All contact edges shall be closed tight and all welds on exposed surfaces dressed smooth and flush.
- F. Frames shall be drilled to receive three silencers at single door openings.

- G. Provision for Hardware: Frames shall be prepared at the factory for the installation of hardware. Comply with applicable requirements in ANSI A250.6 and ANSI A115 Series specifications for door and frame preparation for hardware, unless more stringent requirements are indicated. Welding of hinges to frames will not be permitted. Frames shall be mortised, reinforced, drilled, and tapped to templates to receive all mortised hardware. Provide cover boxes in back of all hardware cut-outs. Lock strikes shall be set out and adjusted to provide clearance for silencers.
1. Provide preparation for rubber silencers on interior room door frames; three per strike jamb at single doors.
  2. Provide concealed metal reinforcements for hardware as required. The gauges of metal for reinforcement shall be in accordance with the manufacturer's recommendations for the type of hardware and the thickness and width of doors to be hung in the frame, provided that the gauges used are not lighter than those required by Commercial Standard CS-242-62. Galvanized for exterior doors.
- H. Wall Anchors: Provide metal anchors of shapes and sizes required for the adjoining type of wall construction. Locate anchors on jambs near the top and bottom of each frame and at intermediate points not over 24 inches apart. Galvanized anchors for exterior frames.
1. Anchor types shall be varied to provide positive fastening to adjacent construction.
  2. Provide UL approved anchors for UL labeled frames. Anchorage of UL label frames shall conform to printed UL test report for door frame manufactured.
- I. Floor Anchors: Provide floor clips of not less than 16-gauge steel and fasten to bottom of each jamb member for anchoring frame to floor construction. Clips shall be adjustable and drilled for 3/8" diameter anchor bolts. Reinforcement: Proper reinforcement shall be provided for all hardware where required. Reinforcements, drilling and tapping for mortised applied hardware shall be done at the factory. Surface applied hardware reinforcements shall be installed at the factory, drilling and tapping shall be done in the field by others.
- J. Frame Insulation - Exterior Installations: Glass fiber, 2" thickness, 3 pound density, Type 703 as manufactured by Owens-Corning Fiberglas Corporation of Toledo, Ohio.

## 2.06 FIELD TOUCH-UP MATERIAL

- A. Galvanizing Repair Paint: Z.R.C. Cold Galvanizing compound, as manufactured by ZRC Products Company of Quincy, Massachusetts.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Prior to installation, all frames must be checked and corrected for rack, twist, and out-of-square.
- B. Frames shall be installed plumb, rigid and in true alignment, with all required anchors securely fastened to wall construction so that frames will retain their position and clearance during final partition work. Door silencers shall not be installed until after the frames have received their final coat of paint.
- C. All doors shall be set true and plumb, with sufficient clearance for free operation, not to exceed 1/8 inch at jambs and heads and 1/4 inch above finish flooring material at bottom. Lock edges of doors shall be so designed to provide proper operating clearance. Finish hardware will be attached prior to any glazing work.

### 3.02 ADJUST AND CLEAN

- A. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of the prime coat and apply touch-up of compatible air drying primer.

END OF SECTION



SECTION 08210

WOOD DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of all interior wood doors and transoms. Doors shall be preglazed.
- B. Provide fire rated doors as required in the drawings.

1.02 RELATED SECTIONS

- A. Section 08100 - Hollow Metal Doors and Frames: Installation of wood doors in hollow metal frames.
- B. Section 08710 - Finish Hardware: Preparation of doors to receive finish hardware items.
- C. Section 09900 - Painting: Field staining of wood doors.

1.03 QUALITY ASSURANCE

- A. Acceptable Manufacturers: Qualified to affix each door with a label with the manufacturer's name and certification of compliance with the National Wood and Window and Door Association (NWWDA). The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
  - 1. Flush Wood Doors
    - a. Marshfield-Algoma Doors
    - b. Eggers Industries of Neenah, WI
    - c. Weyerhaeuser, Inc. of Bridgeville, PA
    - d. Substitute manufacturers shall consider the manufacturing standards and performance requirements of the referenced manufacturers as minimum requirements.
- B. Manufacturer's Standards - Doors shall comply with the following Standards:
  - 1. ANSI/NWWD I.S 1, "Series for Flush Wood Doors", published by the National Wood Window and Door Association (NWWDA).
  - 2. AWI Quality Standards - Section 1300 for Architectural Flush Doors and 1400 for Stile and Rail Door, of "Architectural Woodwork Quality Standards", published by the Architectural Woodwork Institute (AWI).
    - a. Grade: Premium for interior and exterior raised panel doors and Custom for interior flush wood doors.
  - 3. For moisture content, comply with AWI Section 100-S-3.
- C. Testing Requirements
  - 1. Adhesives: NWMA 1.L.1
    - a. Waterproof bond test for Type I exterior doors.
    - b. Water resistant bond test for Type II interior doors.
    - c. Warp: 1.S.1.
    - d. Fire Test: Underwriters Laboratories, Incorporated Standard UL 10, Fire Test of Door Assemblies.
- D. Allowable tolerances for Fabrication of Doors:
  - 1. Size: plus or minus 1/16 inch overall dimensions.
  - 2. Warp: 1/4 inch maximum.
  - 3. Squareness: Length of diagonal measured on face of door from upper right corner to lower left corner between length of diagonal measured on upper left corner to lower right corner: Maximum difference of 1/4 inch.

#### 1.04 SUBMITTALS

- A. Submit the following to the Architect in accordance with Section 01340:
  - 1. Copies of door schedule indicating opening mark number, wood species, sizes, door types and grade, fire classification, swing, undercuts, door facing, finish and glass and glazing materials.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery
  - 1. Deliver doors to site after building has reached average prevailing relative humidity of locality.
  - 2. Deliver in manufacturer's original unopened protective material or container, clearly marked with manufacturer's name, brand name, size, thickness and identifying symbol on covering. Do not remove doors from wrapping until ready to hang.
  - 3. Seal all four edges of doors when delivered to project site.
- B. Storage
  - 1. Stack flat on 2 x 4 lumber, laid 12 inches from ends and across center.
  - 2. Under bottom door and over top of stack provide plywood or corrugated cardboard to protect door surface.
  - 3. Store doors in area where there will be no great variations in heat, dryness, and humidity.
- C. Handling: Do not drag doors across one another.

#### 1.06 GUARANTEES

- A. Flush Wood Doors – Manufacturer's Standard Lifetime Warranty: Doors shall be guaranteed against veneer delamination or splitting; stile and rail splitting or becoming unglued; cover wrapping (bow, cup or twist), and shall also include the provisions of the "Standard Door Guarantee" of the National Wood Window and Door Association (NWWDA), ANSI/NWWDA I.S.1.

### PART 2 - PRODUCTS

#### 2.01 PAINT GRADE FLUSH WOOD DOORS

- A. Solid Core Wood Doors: Lumber particleboard core type shall be AWI PC-7 construction, AWI Custom Grade. Facings shall be paint grade, plain sliced veneer without defects.
  - 1. Doors shall be flush, thickness and sizes shown on Drawings. Stile edge bands shall be thoroughly kiln-dried hardwood. Outer edge bands shall be one piece, matching faces. Rail bands, cross bands and facing shall be laminated to cores with water-resistant adhesive.
  - 2. Doors shall be fire rated as shown in the plans.

#### 2.02 MISCELLANEOUS

- A. Furnish astragals at meeting edge of pairs of wood doors, solid hardwood, meeting specified AWI Grade.
  - 1. Label: UL or WH label on each door to meet indicated rating.
  - 2. Permanently identify each door panel with stamp indicating conformance with NWWDA I.S. 6-86 and AWI standards.

#### 2.03 FACTORY PREPARATIONS

- A. All doors shall be prefitted and factory machined to receive finish hardware, louvers, glazing, etc. Provide complete with moldings and glass stops required for complete installation. Provide solid wood blocking for attachment of finish hardware items.



PART 3 - EXECUTION

3.01 INSPECTION

- A. Verify that door frames are of type required for door and are installed as required for proper installation of doors.
- B. Do not install doors in frames which would hinder the operation of the doors.

3.02 INSTALLATION

A. Fitting and Machining

- 1. Doors shall be prefitted and machined in factory to the maximum extent possible.
- 2. Fit doors to provide the following clearances:
  - a. Maximum of 1/2" from bottom.
  - b. Maximum of 1/8" maximum from top
  - c. Bevel lock and hinge edges 1/8" in 2".
- 3. Machine doors for hardware to clearance tolerances specified.
- 4. Cut light openings in door not exceeding maximum sizes as scheduled on the drawings.

B. Installation of Doors

- 1. Follow door manufacturer's written instructions for all installation work. Installation methods shall not void the door guarantee.
- 2. Clearances
  - a. Allow maximum of 1/8" at jamb and head for job fit doors and prefit doors.
  - b. Allow maximum of 3/16" over threshold or saddle.
  - c. Allow maximum of 1/2" over decorative floor coverings.

3.03 ADJUST AND CLEAN

- A. Replace or rehang doors which are hingebound and do not swing or operate freely.
- B. Replace doors damaged during installation.

3.04 PROTECTION

- A. After installation of doors is complete and all adjustments have been made, install protective bags over each door until the area in which the doors have been install is free of construction. Install protective covering as the door installation progresses throughout the project.

3.05 CLEANUP

- A. Upon completion of wood door installations, remove from the site all excess materials, debris and tools and leave doors ready to receive specified finish.

END OF SECTION



SECTION 08305

ACCESS DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of the access doors to permit access to plumbing, mechanical and electrical apparatus, and access to mezzanine area.

1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood blocking required for the installation of the access doors.
- B. Section 09250 - Gypsum Wallboard: Access doors installed in conjunction with the gypsum wallboard systems.
- C. Section 09510 - Acoustical Tile Ceiling Systems: Access doors installed in lay-in ceiling systems.
- D. Section 09900 - Painting: Field application of finish paint.
- E. Division 22 - Plumbing: Access doors required to provide access to mechanical apparatus.
- F. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Access doors required to provide access to HVAC apparatus.
- G. Division 26 - Electrical: Access doors required to provide access to electrical apparatus.

1.03 QUALITY ASSURANCE

- A. Comply with requirements of regulatory agencies having jurisdiction over this project. Provide Underwriter's Laboratory label on each fire-rated access door.

1.04 SUBMITTALS

- A. Submit copies of technical data and shop drawings to the Architect in accordance with Section 01340. Submittals shall show materials, fabrication, and complete installation / anchorage details. Indicate fire ratings and label as applicable.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store materials on the job site, above ground in a weathertight shelter in a manner to prevent rust and damage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Ceiling Access Doors: Flush with ceiling installation. Construct of sheet metal with concealed continuous hinge and self-closing mechanism. Non-Fire-Rated Door and Frame Unit:
  1. Milcor Model 3204, Style ATR, by Milcor, Inc.
  2. NW Series by Nystrom, Inc.
  3. Type RDW by Karp Associates, Inc.

- B. Wall Access Panels/Doors where exposed to view:
  - 1. Nystrom RW recessed access doors. Provide gypsum board infill to match adjacent surfaces. On Mechanical Room side, provide plywood cover screwed to framing, to prevent accidental passage through access panel. See drawings for panel size.
  - 2. Other manufacturer with approved similar product.
- C. Non-Fire-Rated Access Doors, Flush Wall Installation: Construct of sheet metal with concealed continuous hinge, having recessed screwdriver latch, size(s) as shown on Drawings.
  - 1. Style SR-III, as manufactured by Cesco Products of Minneapolis, Minnesota.
  - 2. Model WB, as manufactured by J.L. Industries of Bloomington, Minnesota.
  - 3. Type RDW, as manufactured by Karp Associates, Inc. of Maspeth, New York.
  - 4. Model NW Series, as manufactured by Nystrom, Inc. of Minneapolis, Minnesota.
- D. Fire Rated Sprinkler System Access Door: U.L. B, 1-1/2 Hour rated with automatic closer, U.L. rated anchors for construction in which door will be installed. Provide lockset with knob released, keyed as directed by Owner.
- E. Access cover plates for concealed plumbing cleanouts shall be round and similar to Wade #W-8470-R, stainless steel.

### PART 3 - EXECUTION

#### 3.01 COORDINATION

- A. Coordinate the installation of the access doors with the drywall installations and mechanical and electrical trades requiring access, as detailed on the Drawings.

#### 3.02 INSTALLATION

- A. Access doors shall be set into place, leveled, plumbed and anchored to the substrate with the appropriate anchoring devices, as shown on the manufacturer's shop drawings.
- B. Locate where required to properly access all concealed devices.
- C. Access doors shall be demonstrated to operate freely and without bind. Completed installations shall be left ready for painting; refer to Section 09900.

END OF SECTION

SECTION 08360  
OVERHEAD DOORS

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Extreme Series High Performance Door System
  - 1. Aluminum Full View Sectional Overhead Door
  - 2. Electric door operator and controls
  - 3. Operating hardware tracks and support

1.02 RELATED SECTIONS

- A. Section 04210 - Brick Masonry: Aluminum clad wood units installed in brick masonry.
- B. Section 05400 - Cold Formed Metal Framing: Metal framing for support of the windows.
- C. Section 06100 - Rough Carpentry: Treated wood blocking required for the window installations.
- D. Section 07100 - Waterproofing and Dampproofing: Coordination of the weather barrier installation with the window installations.
- E. Section 07600 - Flashing and Sheet Metal: Flashings installed in conjunction with the wood windows.
- F. Section 07920 - Sealants and Caulking: Sealing of window perimeters for weathertight installations.
- G. Section 09250 - Gypsum Wallboard: Coordination of the gypsum board installation with the window installations, and coordination of the gypsum board sheathing installation with the window installations.
- H. Section 09900 - Painting: Protection of the glazed surfaces of the windows during painting operations.

1.03 REFERENCES

- A. ASCE 7 American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures
- B. ANSI / DASMA 102; American National Standard specifications for sectional overhead type doors

1.04 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations
  - 2. Installation methods
  - 3. Operation and maintenance data
  - 4. Nameplate data and ratings for motors
- C. Shop Drawings: Include 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.

## 1.05 WIND PERFORMANCE REQUIREMENTS

- A. Design doors to withstand positive and negative wind loads as calculated in accordance with applicable building code.
  - 1. Design Wind Load: +25,-25 lb/sf

## 1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the types of doors specified in this section, with not less than ten years of documented experience.
- B. Installer Qualifications: Company specializing in installing the types of products specified in this section, with minimum of five years of documented experience, and approved by the door manufacturer.

## 1.07 WARRANTY

- A. Finish Limited Warranty
  - 1. Standard Paint: 5 Years
  - 2. Custom Color Option (Color Blast® Finish): 5 years
- B. Parts and Hardware Limited Warranty
  - 1. Parts and Hardware: 1 Year
  - 2. Springs: 2 Years or 50,000 cycles

## PRODUCTS

### 2.01 MANUFACTURERS

- A. Manufacturer
  - 1. Clopay Corporation or equal product by other manufacturer approved in advance.

### 2.02 SECTIONAL OVERHEAD DOORS, Model EX904U

- A. EX904U: Aluminum Full View Sectional Door, Polyurethane Insulated, with glazed and unglazed sections.
  - 1. Panel Sections: 2-1/8 inches thick extruded 6053-T5 aluminum
    - a. Rails, Stiles, and unglazed panels: Polyurethane foam injected
    - b. Stiles: Double end stiles
  - 2. Rollers: Long-stem tandem rollers
  - 3. Astragal: U-shaped flexible PVC in retainer of full-length 0.055 inch rigid PVC
  - 4. IECC: ASTM E283-12 and ANSI/DASMA 105-2012
    - a. U-Factor: 0.86 (with clear insulated glass)
    - b. R-Value: 3.8 (with clear insulated glass)
    - c. Air Infiltration: 0.15cfm/ft<sup>2</sup>
  - 5. Aluminum Finish
    - a. Color Blast® (Sherwin Williams® Color Code - High quality durable two-part Polane® paint system)
    - b. Color by Architect.
  - 6. Windows
    - a. Glazing thickness: 1/2 inch
    - b. Glazing type: Insulated tempered Low E glass
    - c. Glazing tint: Bronze
    - d. SHGC: 0.63
    - e. U-Value: 0.48
    - f. See drawings for glazed panel configuration.

7. Weather-stripping: Provide complete perimeter seals. Provide flexible top seal, flexible jamb seal and U-shaped bottom seal.
8. Track: Designed for 2" diameter rollers. Vertical tracks minimum 0.061 inch galvanized steel. Horizontal tracks minimum 0.075 inch galvanized steel.
  - a. Provide standard track as indicated.
9. Locking
  - a. Provide two inside slide locks with interlock.
10. Spring Counterbalance
  - a. Specialized torsion spring counterbalance mechanism sized to weight of the door. Spring to be helically wound, oil tempered, treated with secondary process to increase cycle life and reliability. Spring to be mounted on a solid steel shaft with center coupling.
  - b. Cable drum of die cast aluminum with high strength galvanized aircraft cable with minimum 7 to 1 safety factor. Cable to be at minimum 7-19 stranded 3/16 diameter with thimble loop.
  - c. Cable Safety Device: Snubbers to help maintain cable tension.
  - d. Spring cycles
    - (1) 50,000 cycles on a single shaft

## 2.03 DOOR OPERATOR

- A. Extreme Series Motor Operator
  1. Manufacturer: LiftMaster
  2. Motor design: 1.25 HP
    - a. 3-phase, 230V
  3. Operation: Variable speed direct drive
    - a. Operator Speed: Travels an average of 24" in the up direction and between 12"-18" in the down direction, depending on door type and drum size. Includes soft start/stop ramps
  4. Motor: Listed by Underwriters Laboratories. Meet UL 325
  5. Wall Controller: Provide separation of low and high voltage wiring and include functionality of 3-button station; set door profile and programming limits, and performs diagnostics
    - a. Floor-level programming: Set limits, door profile, operating modes, and select photo entrapment devices via wall controller from standing height
    - b. Display: Absolute cycle count, service cycle count, diagnostic messages, and door and operator status via 2-line, text LED display.
    - c. Cycle counter: Resettable via wall controller or myQ technology.
    - d. Limit setting: Electronic pushbutton via wall controller.
    - e. Service cycle count, lifetime cycle count, and remote diagnostics via wall controller or myQ technology.
  6. Manual Hoist: Manual hoist with integral manual operation protection circuit
  7. Cable Tension Monitor: Mitigates door operation when cable slackening occurs
  8. Internet connectivity
    - a. Built-in Wi-Fi with myQ technology
    - b. Over-the-air updates
  9. Primary monitored entrapment protection
    - a. Light Curtain UL 325 approved (standard)

## EXECUTION

### 3.01 EXAMINATION

- A. Examine wall and overhead areas, including opening framing and blocking, with installer present, for compliance with requirements for installation tolerances, clearances, and other conditions affecting performance of Work in this Section.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

- C. If substrate preparation is the responsibility of another entity, notify Architect of unsatisfactory preparation before proceeding.

### 3.02 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### 3.03 INSTALLATION

- A. Install overhead doors and track in accordance with approved shop drawings and the manufacturer's printed instructions.

### 3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION



SECTION 08361  
FOLDING DOOR SYSTEM

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Equipment and materials required for furnishing four-fold folding door system for truck bays.
  - 1. This Section includes Four-Fold metal doors with surface mounted tube frames.
  - 2. Operation of Four-Fold metal doors includes overhead mounted electro-mechanical operators.

1.02 RELATED SECTIONS

- A. Section 04210 - Brick Masonry: Aluminum clad wood units installed in brick masonry.
- B. Section 05400 - Cold Formed Metal Framing: Metal framing for support of the windows.
- C. Section 06100 - Rough Carpentry: Treated wood blocking required for the window installations.
- D. Section 07100 - Waterproofing and Dampproofing: Coordination of the weather barrier installation with the window installations.
- E. Section 07600 - Flashing and Sheet Metal: Flashings installed in conjunction with the wood windows.
- F. Section 07920 - Sealants and Caulking: Sealing of window perimeters for weathertight installations.
- G. Section 09250 - Gypsum Wallboard: Coordination of the gypsum board installation with the window installations, and coordination of the gypsum board sheathing installation with the window installations.
- H. Section 09900 - Painting: Protection of the glazed surfaces of the windows during painting operations.

1.03 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each type of product specified consisting of manufacturer's technical Product Data and installation instructions for each type of door required, including data substantiating that products comply with requirements.
- C. Submittal Drawings showing fabrication and installation of Four-Fold metal doors including plans, elevations, sections, details of components, hardware, operating mechanism, and attachments to the other units of Work. Include wiring diagrams for coordination with electrical trade.
- D. Reference list including (5) successful installations of this type of door within the past two (2) years.

1.04 QUALITY ASSURANCE

- A. Doors shall be designed to withstand external or internal horizontal wind loads of 120mph (3 second gust) per ASCE 7-16. The maximum allowable deflection shall not exceed 1/120 of the span. Fiber stresses in main members shall be limited to 27,000 pounds per square inch. Steel frames shall be designed in accordance with the AISC "Steel Construction Manual".
- B. Door manufacturer shall have at least 10 years' experience in manufacturing door type specified.

## 1.05 DELIVERY, STORAGE AND HANDLING

- A. Store delivered materials and equipment in dry locations with adequate ventilation, free from dust and water, and so as to permit access for inspection and handling.
- B. Handle materials carefully to prevent damage.

## 1.06 WARRANTY

- A. The door manufacturer shall provide a written standard limited warranty for material and workmanship.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURERS

- A. Manufacturers: Four-Fold industrial metal doors manufactured by Door Engineering and Manufacturing, 101 Power Dr, Mankato, MN 56001, (800)-959-1352 or equal product by other manufacturer approved in advance.
- B. FF300 Series: Glazed

### 2.02 MATERIALS

- A. Steel Tube: ASTM A513 and ASTM A500/A500M
- B. Steel Sheets: Steel sheets of commercial quality, complying with ASTM A1008 cold-rolled steel sheet.
- C. Hardware: Manufacturer's standard components.
- D. Fasteners: Zinc-coated steel.

### 2.03 FOUR-FOLD DOORS

- A. Construction: Door framing shall be minimum 11-gauge structural steel tube with 16-gauge steel sheet on the exterior and interior faces. Sheeting shall be formed on the vertical edges with no visible welds on the interior or exterior panel faces. All frames and framing members shall be true to dimension and square in all directions, and no door shall be bowed, warped, or out of line, in the vertical or horizontal plane of the door opening by more than 1/8 inch in 20 feet. Exposed welds and welds which interfere with the installation of various parts shall be ground smooth and flush.
- B. Surface Mounted Tube Frame: Supply pre-hung tube frame system constructed of minimum TS6x4x3/16", designed to anchor to masonry wall construction or weld to steel structure. All hinges, track supports and operator supports shall be factory attached.
- C. Factory finish: Door Panels and Tube Frames shall be finished with manufacturer's standard PPG Spectracron epoxy primer and polyurethane top coat. Customer to select from Manufacturer's standard color chart or furnish sample to match.
  - 1. Operator and operating hardware shall be powder-coated manufacturer's standard gray.
- D. Hardware: Hardware shall include guide tracks and brackets, trolleys, center guides, not less than three pairs of jamb and fold hinges per opening, and all bolts, nuts, fasteners, etc. necessary for complete installation and operation.
  - 1. All hardware, including hinges and trolleys, shall be bolted to the panel for easy removal for service or panel replacement.
  - 2. Doors up to 16' wide and under 30psf windload shall require no floor mounted supports, guides or tracks.

3. Top tracks shall be adjustable on the end track hangers to allow for adjustment of the door panels in the open position and easily replaceable without removal of the door framing or operators.
- E. Hinges: Jamb hinges shall be dual shear and have two thrust bearings and two needle bearings. Fold hinges shall be stainless steel and be dual shear with two thrust bearings. All bearings shall be completely concealed within the hinge barrel and include grease zerks. All hinge pins shall be minimum 3/4" diameter hardened steel.
- F. Hinge Guards: Provide plastic guards at jamb hinges to prevent access through hinge space.
- G. Weatherstripping: Material shall be adjustable and readily replaceable and provide a substantially weather-tight installation. Weatherstripping at center shall be 1/16" EPDM and include no exposed fasteners on the exterior side of the panel. Weatherstripping at sill shall include two 1/16" EPDM sweeps with an aluminum retainer. The retainer shall be attached to the door with adhesive.
- H. Perimeter Weatherstripping: Provide full perimeter jamb and head weatherstripping.
- I. Vision Panels: Provide 1" insulated, tempered, vision panels of the size, shape and location as noted on the drawings.

#### 2.04 OPERATOR

- A. Each Four-Fold door shall be operated by an overhead mounted electro-mechanical drive unit designed for high cycle operation. Operator consists of an electric motor, gear reducer, and rotating drive arm. The door shall be operated with connecting rods attached to the rotating drive arm on the operator and to control arms attached to the jamb door section and to the door lintel. The connecting rods shall be positive drive, keeping the door under firm control at all times. The connecting rods shall be fitted with spherical bearings and control arms shall be equipped with oil impregnated bronze bearings on polished shafts.
- B. Operator shall be instantly reversible, open and close rapidly, and start and stop gradually. Operator shall be adjustable to allow door to fully clear the opening. Operator shall automatically lock the door in the closed position. Operator shall be equipped with disengaging mechanism to convert to manual operation.
- C. Electric motor shall be of sufficient size to operate doors under normal operating conditions at no more than 75 percent of rated capacity. The motor shall be wound for three phase 208/230/480 VAC, 60 Hertz operation.
- D. Electric Controls: Controls shall be furnished by the door manufacturer and shall be complete for each door, and built in accordance with the latest NEMA standards. Incoming electrical shall be: 120VAC single phase.
  1. Control panel assemblies shall be UL listed as per NFPA70.
  2. Controls shall include a programmable logic controller with digital message display. Controller shall include programmable close timers and programmable inputs/outputs.
  3. Controls shall include a variable frequency drive with independent adjustment of the opening and closing speeds.
  4. Enclosures shall be NEMA 4 with disconnect switch.
  5. Pushbuttons (interior) for each door shall have one (1) momentary pressure three-button push-button station marked "OPEN", "CLOSE" and "STOP". Push button enclosure shall be NEMA 4.
  6. Limit switches shall be provided to stop the travel of the door in its fully open or fully closed position.
  7. Safety edges: Provide monitored electric safety edges on leading edge of all doors to reverse door upon contact with obstruction.
  8. Photo eyes: Provide (1) exterior, jamb mounted, light Curtain type photo eyes, NEMA 4 rated. Photo eye shall cover from floor level to 72" above floor.
  9. Presence Sensor: Provide (1) interior, overhead mounted, presence sensor BEA IS40P or equal. Doors over 16' tall shall include LZR-Widescan or equal.
  10. Radio controls: Provide one (1) radio receiver and (1) single button remotes per door. Remotes to open and close doors with single button.
  11. Wiring: Door manufacturer shall supply controls and components only. Electrical contractor shall install controls and furnish and install conduits and wiring for jobsite power and control wiring.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install Four-Fold metal doors in strict accordance with the approved drawings by qualified door erection crews. All door openings shall be completely prepared by the general contractor prior to the installation of the doors. Permanent or temporary electric wiring shall be brought to the door opening before installation is started and shall be completed so as not to delay the inspection test.
- B. Doors shall be set plumb, level, and square, and with all parts properly fastened and mounted. All moving parts shall be tested and adjusted and left in good operating condition.

### 3.02 ADJUSTING AND CLEANING

- A. Inspection of the doors and a complete operating test will be made by the installer in the presence of the general contractor or architect as soon as the erection is complete. Any defects noted shall be corrected. After door approval in the above test, the general contractor must assume the responsibility for any damage or rough handling of the doors during construction until the building is turned over to the owner and final inspection is made.
- B. Clean surfaces and repaint abraded or damaged finished surfaces to match factory-applied finish.

END OF SECTION

SECTION 08640

ALUMINUM CLAD WOOD WINDOWS AND DOORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes equipment, labor, and materials required for furnishing and installing pre-assembled, pre-glazed aluminum clad wood windows and doors, including accessories as required for a watertight and weathertight installation.

1.02 RELATED SECTIONS

- A. Section 04210 – Brick Masonry: Aluminum clad wood units installed in brick masonry.
- B. Section 05400 - Cold Formed Metal Framing: Metal framing for support of the windows.
- C. Section 06100 - Rough Carpentry: Treated wood blocking required for the window installations.
- D. Section 07100 - Waterproofing and Dampproofing: Coordination of the weather barrier installation with the window installations.
- E. Section 07411 - Metal Roof and Wall Panels: Aluminum clad wood units installed in metal panel walls.
- F. Section 07464 - Fiber Cement Siding, Trim and Soffits: Aluminum clad wood units installed in fiber cement siding.
- G. Section 07600 - Flashing and Sheet Metal: Flashings installed in conjunction with the wood windows.
- H. Section 07920 - Sealants and Caulking: Sealing of window perimeters for weathertight installations.
- I. Section 08710 - Finish Hardware: Door hardware.
- J. Section 09250 - Gypsum Wallboard: Coordination of the gypsum board installation with the window installations, and coordination of the gypsum board sheathing installation with the window installations.
- K. Section 09900 - Painting: Protection of the glazed surfaces of the windows during painting operations.

1.03 REFERENCES

- A. American Society for Testing and Materials (ASTM):
- B. ASTM E 283--Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
- C. ASTM E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- D. ASTM E 547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
- E. ASTM E 774: Specification for Sealed Insulating Glass Units.
- F. ASTM C 1036: Standard Specification for Flat Glass.

- G. American National Standards Institute/National Wood Window and Door Association (ANSI/NWWDA):
  - 1. ANSI/NWWDA I.S.2 Industry Standard for Wood Windows.
  - 2. ANSI/NWWDA I.S.4 Industry Standard for Water Repellent Preservative Treatment for Millwork.
- H. Sealed Insulating Glass Manufacturers Association/Insulating Glass Certification Council (SIGMA/IGCC).

#### 1.04 QUALITY ASSURANCE

- A. Design and Performance Requirements:
  - 1. Window units shall be designed to comply with ANSI/NWWDA I.S.2-87 Grade 60 or ANSI/NWWDA I.S.2-93 DP40.
  - 2. Air leakage shall not exceed the following when tested at 1.57 psf according to ASTM E283: 0.10 cfm per linear foot of sash crack for Grade 60; 0.15 cfm per square foot of frame for DP40.
  - 3. No water penetration when tested at the following pressure according to ASTM E547: 6.24 psf for Grade 60; 6.0 psf for DP40.
  - 4. Assembly shall withstand a positive or negative uniform static air pressure difference of 60 psf without damage when tested according to ASTM E330.
- B. For installation conference requirements, see Section 01200 - Project Meetings.
- C. Provide a window meeting the project specifications for installation in the mockup panel. Refer to the drawings and Section 01451.

#### 1.05 FIELD MEASUREMENTS

- A. Field verify measurements as required to properly size windows and doors for existing openings.

#### 1.06 SUBMITTALS

- A. Submit copies of manufacturer's product data, installation instructions and shop drawings for doors and windows.
- B. Shop drawings shall indicate installation details showing all surrounding materials, materials used in door and window fabrication, finish, joinery, glazing and anchorages and anchorage requirements for the substrate(s) involved. Submittals shall be in accordance with Section 01340.
- C. 12" x 12" Samples of each type and thickness of glass shall be submitted for approval. Submit manufacturer's certification that materials submitted meet specification requirements.
- D. Substitutions: Materials specified herein to be a certain manufacture or brand are used as a standard and materials of other manufacture may be submitted for substitution provided that they meet or exceed quality and performance specified. Submit in accordance with Sections 01340 and 01600.

#### 1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Window units shall arrive at the job site packed and crated in manufacturer's original cartons.
- B. Store windows under cover, on wood runners and in an upright manner that will prevent damage. Labels shall not be removed until final inspection.
- C. Store door panels flat on a level surface in a clean and dry storage area. Seal unfinished top and bottom edges of door panels if door panels are stored at the job site more than one (1) week.
- D. Condition doors to local average humidity before hanging.
- E. Reject defective units. Installation of defective units will not be acceptable.

## 1.08 WARRANTY

- A. Windows and doors shall be warranted to be free from defects in manufacturing, materials, and workmanship for a period of ten (10) years from date of purchase.
- B. Replace windows and window components failing to perform during this warranty period at no cost to the Owner. Replacement shall include materials and labor.
- C. Replace doors failing to perform during this warranty period at no cost to the Owner. Replacement shall include materials and labor.
- D. Insulating glass shall be warranted against visible obstruction through the glass caused by a failure of the insulating glass air seal for a period of twenty (20) years from the date of original purchase.

## PART 2 - PRODUCTS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Acceptable Manufacturers
  - 1. Marvin Windows and Doors
  - 2. Sierra Pacific Windows
  - 3. Anderson Windows
  - 4. Pella Windows
  - 5. Other manufacturers subject to compliance with the project requirements
- B. Basis of design: Marvin Ultimate Clad windows and doors.
- C. Submit substitution requests in accordance with Section 01600.
  - 1. Exact match to existing windows and doors in Phase 1 is required for shape, profile, operation, etc.

### 2.02 ALUMINUM CLAD WOOD WINDOWS

- A. Description: Aluminum clad wood windows, factory assembled, pre-glazed, operable and fixed designs.
  - 1. Furnish window units with interior wood trim.
  - 2. Furnish extruded aluminum brick mold as shown in the drawings.
- B. Frame
  - 1. Interior: Clear pine. Finger jointed material will not be acceptable.
  - 2. Exterior: Clad with 0.050 inch thick extruded aluminum, prefinished in color as selected by the Architect.
  - 3. Color: Marvin "Select Clad Colors"
  - 4. Head: 1 1/16 inch thick.
  - 5. Jambs: 1-3/32 composite jambs.
  - 6. Sills: 1-7/16 inch thick
  - 7. Frame Width: 5 inches.
  - 8. Brick Mold: Provide extruded aluminum brick mold, shapes and sizes where shown in drawings. Brick mold shall be factory applied.
- C. Sash
  - 1. Finish
    - a. Interior: Clear pine, to be field painted.
    - b. Exterior: Clad with 0.050 inch thick extruded aluminum, prefinished in color as selected by Architect.
    - c. Composite Sash Thickness: 1-9/16"
    - d. Picture Unit and Transom Thickness: 1-7/8" thickness.

2. Glazing: Select quality complying with ASTM C 1036. Insulating glass SIGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E 774. Provide 1" insulating, Low E II glass, and frosted insulated glazing where noted in drawings. Provide divided light grid pattern, as shown on drawings.
  3. Hardware: Factory installed corrosion-resistant, operating hardware and fasteners.
    - a. Sash and Lock Keeper: Surface mounted, open style crescent cam lock, with oil rubbed bronze finish.
    - b. Sash Lift: Oil rubbed bronze.
    - c. Sash Tilt Lever: Oil rubbed bronze.
    - d. Balance System: Block and tackle balance system.
    - e. Operating Crank: Oil rubbed bronze
- D. Weatherstripping
1. Operating units: Continuous leaf weather strip at head and jamb; dual bulb at check rail, weather strip at bottom rail.
  2. Picture Units: Continuous weather strip at perimeter; leaf and bulb weather strip at jamb, bulb weather strip at head and sill.
- E. Jamb Extensions: Provide manufacturer's standard jamb extensions as required to accommodate various wall thickness.
- F. Installation Brackets: Manufacturer's standard brackets designed to accommodate wall construction at window location.
- G. Divided Lite Muntins
1. Interior Bars: 7/8" wide bars, finished to match window interior.
  2. Internal Spacer Bars: 7/8" wide bars, finished to match window interior.
  3. Exterior Bars: 7/8" wide bars, finished to match window exterior.
- H. Structure
1. All internal structure required for the aluminum clad wood windows shall be designed, and provided by the window manufacturer as part of the window system.

### 2.03 ALUMINUM CLAD WOOD DOORS

- A. Description: Aluminum clad wood doors, factory assembled, preglazed.
1. Furnish units with interior wood trim.
- B. Construction: Finger jointed, edge glued pine core with wood laminated veneer to the interior and aluminum coated bare wood to the exterior. Aluminum coating shall comply with AAMA 2605-05.
- C. Frame Description
1. Finger jointed, edge-glued pine core with vertical grain, Clear Pine interior, with no finger jointing.
    - a. Kiln dried to a moisture content no greater than twelve (12) percent at the time of fabrication.
    - b. Water repellent, preservative treated in accordance with WDMA I.S.4.
  2. Frame width: 4-9/16 inches.
  3. Frame thickness: 1-1/16 inches
  4. Exterior extruded aluminum clad 0.050 inch thick.
  5. Low profile sill. Jambs extended 7/8 inch (22 mm) beyond panel bottom.
  6. Steel frame with unequal rabbet minimum 16 gauge, in size compatible with opening size and wall construction.
  7. Anchors: Provide anchors compatible with type of wall construction in which door is located.
  8. Finish: Field stained interior.
  9. Casing: 3" flat aluminum clad casing, or as selected from standard shapes.



- D. Panels: Provide raised panels, in configuration indicated on Drawings.
1. Stiles: finger jointed, edge-glued LVL. Rails: finger jointed, edge-glued pine cores with Pine interior.
    - a. Kiln dried to a moisture content no greater than twelve (12) percent at time of fabrication.
    - b. Water repellent, preservative treated in accordance with WDMA I.S.4.
  2. Stiles contain laminated veneer lumber (LVL) core, solid wood top and bottom rail, with Pine interior.
  3. Composite Panel Thickness: 2-1/4 inch thickness.
  4. Exterior Extruded Aluminum cladding: 0.055 inch thick.
  5. Top Rail Width: 8-3/8 inch panel.
  6. Stile width: 6 inches (152 mm).
  7. Bottom rail height: 11-3/8 inches (289 mm).
  8. Panel corners glued and fastened with 5/8 x 4 inch fluted hardwood dowels. Removable interior wood glazing stops with clear wood covers; 1-3/4 inch panel - no visible fastener holes (2-1/4 inch panel – nailed on glazing stops).
  9. Finish: Field painted.
- E. Glazing
1. Select quality complying with ASTM C 1036. Comply with 16 CFR 1201 Safety Standard for Architectural Glazing Materials. Tempered insulating glass IGMA/IGCC certified to performance level CBA when tested in accordance with ASTM E 774.
  2. Glass Type: Clear, Low E II—Argon Gas; except provide laminated glass, with .030 polyvinyl butyral inner layer where glass may be subjected to human impact.
    - a. Glazing Seal: Silicone bedding, exterior.
- F. Exterior Finish: Extruded aluminum clad. Fluoropolymer modified acrylic topcoat applied over primer. Meets or exceeds AAMA 2605 requirements.
1. Color: As selected by Architect from manufacturer's colors.
- G. Interior Finish: Treated bare wood for field painting.
- H. Hardware
1. Hinges: 4-1/2" x 4-1/2" square corner ball bearing hinges. Finish: Bronze.
  2. Locking System: As specified in Section 08710.
- I. Weatherstripping: Head jamb and side jambs to have two sets of bulb weather strip, locking stiles have pile weather strip maintaining contact with door panels. Provide pile weather stripping at center of paired doors, factory applied.
- J. Jamb Extensions
1. Factory installed (loose), for wall thickness indicated or required.
  2. Finish: Match interior frame wood species and finish.
- K. Installation and Hardware Accessories
1. Factory installed vinyl nailing fin/drip cap.
  2. Installation brackets: Installation Brackets: Manufacturer's standard brackets designed to accommodate wall construction at door location.
- L. Aluminum Extrusions
1. Profile: Brick mould casing; Flat casing; Frame expander; Jamb extender; Mullion cover; Mullion expander as indicated on drawings.
  2. Finish: Fluoropolymer modified acrylic topcoat applied over primer. Meeting or exceeding AAMA 2605 requirements.
  3. Color: As selected by Architect.

M. Divided Lites

1. Interior Bars: 7/8" wide bars, finished to match window interior.
2. Internal Spacer Bars: 7/8" wide bars, finished to match window interior.
3. Exterior Bars: 7/8" wide bars, finished to match window exterior.

N. Structure

1. All internal structure required for the aluminum clad wood doors shall be designed, and provided by the door manufacturer as part of the door system.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Comply with applicable requirements the manufacturer and of other Sections of these specifications for the installation of all component parts, including sealants, joint fillers, flashing, insulation, masonry, and other elements of the wall system.

### 3.02 EXAMINATION

- A. Prior to starting door and window installation, check the work for defects that may negatively impact proper performance of this work. Defects shall be corrected prior to starting window installations.
- B. Starting work under this section implies acceptance of work of others as being suitable for the proper installation of the work of this Section.

### 3.03 ALUMINUM CLAD WINDOW INSTALLATION

- A. Do not install component parts which are observed to be defective in any way, including warped, bowed, dented, abraded and broken members, and including preglazed damaged glass.
- B. Install windows in prepared openings in accordance with manufacturer's printed instructions. Mount window units with screws through the frames, per the manufacturer's instructions; mounting with nailing flanges is not allowed. Windows assemblies shall be properly flashed with material as specified under Section 07600. Apply sealant the full perimeter of the windows; refer to Section 07920 for sealant.
- C. Windows shall be installed square, plumb and totally rigid. Remove and replace units which have been damaged during installation or after installation, before date of Substantial Completion.
- D. Do not cut, trim or modify component parts during erection in a manner that would damage the strength or finish, or result in a visual imperfection or a failure in performance of the windows and doors.
- E. Return component parts that require alteration to the shop for re-fabrication, if possible, or replace with new parts.
- F. Adjust operable sash to work freely with hardware functioning properly. Re-adjust at completion of the project if directed.

### 3.04 ALUMINUM CLAD WOOD DOOR INSTALLATION

- A. Assemble and install doors and frames according to manufacturer's instructions and reviewed shop drawings.
- B. Install accessory items as required for complete and proper installation of doors.
- C. Use finish nails to apply wood trim and moldings.

D. Install doors plumb and level. Adjust door to work freely with hardware functioning properly.

3.05 CLEANUP

A. Remove visible labels and adhesive residue according to manufacturer's instructions.

B. Upon completion of the installations remove excess materials and debris from the job site.

C. Clean glass using compatible cleaning agents that will not harm the glass or sealants.

3.06 PROTECTION

A. Protect installed windows and doors from damage until the date of Substantial Completion.

B. Damaged units shall be repaired or replaced at no cost to the Owner.

END OF SECTION



SECTION 08710  
FINISH HARDWARE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes all finish hardware and related items.

1.02 RELATED SECTIONS

- A. Section 08100 - Hollow Metal Doors and Frames: Preparation of hollow metal work to receive finish hardware items. Installation of finish hardware items.
- B. Section 08210 - Wood Doors: Preparation of wood doors to receive finish hardware items (factory preparation). Installation of finish hardware items.
- C. Section 08640 - Aluminum Clad Windows and Doors: Preparation of clad wood windows and doors to receive finish hardware.
- D. Section 09900 - Painting: Removal of finish hardware items before finishing of doors and frames.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements
  - 1. All hardware and its installation shall comply with the Handicapped Code having jurisdiction over this project.
  - 2. Comply with requirements of the Americans with Disabilities Act (ADA) for hardware type, installation methods and mounting heights.

1.04 SUBMITTALS

- A. Submittals shall be made in accordance with Section 01340. Copies of technical data, catalog cuts of each piece of hardware to be used and a Contractor prepared hardware schedule shall be submitted to the Architect. Physical samples of hardware items shall be furnished, if requested. The Contractor prepared hardware schedule shall be furnished with reference being made to door numbers and room numbers indicated on the drawings and shall list all manufacturers. Modifications made in hardware schedule after approval shall be made solely to provide the desired operation or functional feature and will be made only after obtaining written approval. Provide a full-time competent hardware consultant available at all times to work with the Architect and Contractor.

1.05 JOB CONDITIONS

- A. Protection: Hardware shall arrive at the job site packed in heavy cartons marked to agree with the approved hardware schedule. Prior to installation store material under cover in a manner that will prevent damage and theft.

1.06 KEYING

- A. Key and Master Key as directed; coordinate with Owner.

## 1.07 GUARANTEES

- A. Guarantee all materials to be free from defects in materials and workmanship and perform satisfactorily for the use(s) intended for a period of two (2) years from the Date of Substantial Completion.
- B. Provided extended guarantees on the following items:
  - 1. Door Closers: Ten (10) year period.
  - 2. Exit Devices: Three (3) year period.
- C. Hardware items which become defective within this time shall be replaced by the Contractor at no cost to the Owner (materials and installation).

## 1.08 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
- B. Parts Kits: Furnish manufacturers' standard parts kits for locksets, exit devices, and door closers.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Finish hardware shall be Commercial Grade 1. Finish hardware items shall be provided by the Allowance specified under Section 01020, Allowances.

### 2.02 MATERIALS AND FABRICATION

- A. Manufacturer's Name Plate: Do not use manufacturers' products that have manufacturer's name or trade name displayed in a visible location (omit removable nameplates). Manufacturer's identification will be permitted on rim of lock cylinders only.
- B. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
  - 1. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.
  - 2. Furnish screws for installation with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
  - 3. Provide concealed fasteners for hardware units that are exposed when door is closed, except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of adequately fastening the hardware. Coordinate with metal doors and frames where thru-bolts are used as a means of reinforcing the work. Provide sleeves for each thru-bolt or use sex bolt fasteners.

### 2.03 HARDWARE FINISHES

- A. Match items to the manufacturer's standard color and texture finish for the latch and lock sets. Finish shall be oil rubbed bronze (US10B). Coordinate finish of hardware items with cabinet hardware finishes and finishes on Owner's ecclesiastical items.
- B. Finishes shall be as shown in the Hardware Headings in the Contractor-Prepared Finish Hardware Schedule.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. All hardware will be installed plumb, rigid and in true alignment with doors. There shall be no excess clearance at the heads, jambs or sills. Care shall be taken in supplying the proper fastening device for each item so as to obtain best results.
- B. All items shall be installed level, square and in proper alignment and relationship to all adjoining work. Attachment shall be means of appropriate nails, screws bolts and/or anchors or corresponding materials.
- C. Set all thresholds in full bed of sealant and anchor with 1/4" machine screws and expansion or lead shields.
- D. At points where aluminum comes into contact with steel, prime the steel first with asphalt paint then attach aluminum members.
- E. All door silencers will be installed after doors and frames have received final painting. Under no circumstances will door silencers be painted.
- F. Location of Hardware: The locations of hardware on door and frames shall be in accordance with the requirements of The National Association of Architectural Metal Manufacturers Association (NAAMM), The Steel Door Institute and the applicable handicapped codes and ordinances.
- G. Surface mounted hardware, such as closers, bolts, exit devices, shall be thru-bolted, utilizing bolts, nuts and washers.

3.02 JOB COMPLETION INSTRUCTIONS

- A. At the completion of the job, all the hardware, manufacturer's tools, wrenches, instructions and maintenance information, keylist, and key inventory shall be turned over to the Owner for use in maintaining the hardware.
- B. Protect all knobs, levers and trim until completion of construction. Deliver all keys, properly labeled, to the Owner.

END OF SECTION





SECTION 08800  
GLASS AND GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes, but not limited to the following:
  - 1. Glass and glazing in hollow metal work.
  - 2. Door view lites.
  - 3. Mirrors.
  - 4. All accessories required for complete installations and weathertight glazing.

1.02 RELATED SECTIONS

- A. Section 08100 - Hollow Metal Doors and Frames: View lights installed in steel doors.
- B. Section 08210 - Wood Doors: View lites installed in wood doors.
- C. Section 08640 - Aluminum Clad Windows and Doors: Glazing by window manufacturer.
- D. Section 09900 - Painting: Completion of painting operations prior to mirror installations.

1.03 QUALITY ASSURANCE

- A. Inspection of Glass Insulating Glass Units During Fabrication: Quality control shall be established for washing, assembly, and packaging stages of production. Units shall be inspected for primary seal continuity, sight-line consistency and foreign material sealed in lite.
- B. Glass Quality
  - 1. Float: ASTM C1036-85, Type I, Class 1, Quality q3.
  - 2. Tempered: ASTM C1048-85, Kind HT, Type I, Class 1, Quality q3. Fully temper in accordance with ANSI Z97.1-1984.
  - 3. UL listed as required by the building code for fire rated door and window assemblies.

1.04 SUBMITTALS

- A. Submit copies of technical data and shop drawings to the Architect in accordance with Section 01340. Reference shall be made to room names and numbers and schedule numbers shown on the drawings.
- B. Two (2) 12"x12" samples of each type and thickness of glass shall be submitted for approval. Submit manufacturer's certification that materials submitted meet specification requirements.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All glass and related materials shall arrive at the job site properly packed and crated and marked to agree with the approved shop drawings and bearing factory labels on each pane. Labels shall not be removed until final inspection.
- B. Store material under cover on wood runners on floors in an upright position and in a manner that will prevent damage.

## 1.06 GUARANTEES

- A. Provide manufacturer's standard 10-year warranty protecting insulating glass against failure of seal. Replace glass (material and labor) units failing to perform during this warranty period at no cost to the Owner.
- B. Guarantee for Unframed Mirrors: Warrant against silver spoilage for ten (10) year period.
- C. Date of warranties shall commence at the Date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 GLASS AND GLAZING MATERIALS

- A. Aluminum Clad Wood Windows and Doors: 1" Insulating glass.
  - 1. Inboard Lite: 1/4" Thickness, clear tempered.
  - 2. Outboard Lite: 1/4" Thickness, clear tempered.
  - 3. Glazing to meet requirements of door manufacturer.
  - 4. Glazing: Exterior EPDM gasket threaded into the aluminum glazing bead; 1" insulating glass made with mandatory safety glass lites; interior EPDM gasket threaded into the aluminum glazing bead; field-glazed by the entrance door installer.
  - 5. Provide 3-grid divided light pattern as shown on drawings, and specified in Section 08640.
- B. Interior Door View Lites and Sidelites
  - 1. Glass in Non-Fire-Rated Door View Panels/Wall Assemblies: 1/4" clear tempered.
- C. Interior Door and Window Fire Rated Glazing
  - 1. FireLite or FireLite Plus, as manufacture by Nippon Electric Glass Company, Ltd., and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 phone (800.426.0279) fax (425.396.8300) e-mail sales@fireglass.com, website <http://www.fireglass.com>
  - 2. Rating: As required in the drawings.
- D. Unframed Mirrors: 1/4" Thick float glass with silvered backing with a film of copper electrolytically deposited directly over the silvered surface. A protective coating of two (2) coats of an approved mirror backing paint shall be applied over the copper backing. Edges of mirrors shall be ground smooth and polished. Provide mirrors with standard edge coating treatment (PPG UC-4401) to protect silvering from chemical attack.
- E. Setting Blocks and Edge Cushions
  - 1. Setting Blocks
    - a. Neoprene, EPDM, or silicone; ASTM D1056-78, 85 Shore A durometer hardness.
    - b. Width: 1/16" Less than full channel width.
    - c. Height: Sufficient height to provide recommended nominal bite and minimum edge clearance.
    - d. Length: 0.1" Length per SF glass, but not less than 4" long.
  - 2. Edge cushions: Neoprene; ASTM D1056-78, 65 Shore A durometer hardness, 3" long minimum.
- F. Spacer Shims: Neoprene; ASTM D1056-78, 40-50 durometer hardness.
- G. Miscellaneous Accessories
  - 1. Glazing tape shall be Tremco Polyshim, as manufactured by Tremco of Cleveland, Ohio.
  - 2. Glazing sealant shall be Spectrem 2, as manufactured by Tremco of Cleveland, Ohio.
  - 3. Glazing Gaskets for Entrance Doors and Aluminum Curtain Wall Framing Systems: Provided as a component of the framing system. Provide manufacturer's standard EPDM glazing gaskets for specified system.
  - 4. Exposed Mirror Clips
    - a. Top Clip: Knape & Vogt #318, 9/16" wide x 1-1.4" long.
    - b. Bottom Clip: Continuous clip at base.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Watertight and airtight installation of each glass product is required, except changes, wind loading, impact loading (for doors), without failure including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.
- B. Protect glass from damage during handling and installation, and subsequent operation of glazed components of the work. During installation, discard units with significant edge damage or other imperfections.

### 3.02 INSTALLATION

- A. Install glazing materials in accordance with manufacturer's product data and applicable standards, except where more stringent requirements are specified.
- B. Install setting blocks for glazing materials over six (6) square foot area. Install at sill rabbet at quarter points. Size setting blocks in proportion to glass weight; minimum 4" length.
- C. Shim lites over 100 united inches, inboard and outboard, on all sides using continuous shims.
- D. Interior Channel Glazing: Glaze using polyvinylchloride tape applied to both sides, all stops. Place tape with butted joints. Compress tape approximately 30%. Center glazing material in rabbet. Support glass all around with neoprene setting blocks, with no metal-to-glass or wood-to-glass contact. Draw up glazing beads with equal pressure all around.
- E. Tempered Glass: Position bug or hallmark on unit so final position in framed opening occurs consistently in lower right-hand corner of unit, parallel to floor in inconspicuous location.
- F. Cutting or altering lites of tempered and/or insulating glass in field is prohibited.
- G. Mirrors
  - 1. Prepare walls with primer; install with adhesive (Palmer Mirro-Mastic) in accordance with manufacturer's product data; allow for vertical air movement behind unit; provide continuous mirror support along bottom edge attaching to wall using toggle bolts spaced at 1'-4" o.c., maximum.
  - 2. Install plumb and level.
  - 3. Multiple mirror installation, additional requirements:
    - a. Prior to mounting mirrors, examine substrates for out-of-plane surfaces affecting mirror installation. Set mirrors plumb, level, and in straight plane without image interruption at mirror joints.
    - b. Provide continuous mirror channel trim at top and exposed mirror edges; attach to wall using toggle bolts spaced at 1'-4" o.c., maximum.

### 3.03 PROTECTION AND CLEANING

- A. After all construction has been completed and prior to Substantial Completion inspection and the possibility of glass breakage has been reduced to a minimum, remove all labels. Wash and polish glass on both faces, removing all paint, smears, and spots. Glass broken or damaged prior to date of Substantial Completion shall be replaced with glass of a like kind and quality at no expense to the Owner.
- B. Remove all excess materials and debris from the project site.

END OF SECTION



SECTION 09250  
GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes furnishing materials and installation of interior and exterior gypsum wallboard and gypsum wallboard systems and assemblies.
- B. Includes suspension system for gypsum board ceilings.

1.02 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Fabricated steel members required for bracing, supporting and for attachment of hangers for gypsum drywall assemblies.
- B. Section 06100 - Rough Carpentry: Treated wood blocking and nailers installed in conjunction with the gypsum wallboard.
- C. Section 07100 - Waterproofing and Dampproofing: Dampproofing applied over gypsum sheathing joints where gypsum sheathing is used as backup for masonry veneer. Building wrap installed over gypsum sheathing.
- D. Section 07920 - Sealants and Caulking: Sealing of gypsum assemblies.
- E. Section 08100 - Hollow Metal Doors and Frames: Coordination of door frame installations with drywall work.
- F. Section 08305 - Access Doors: Installation of access doors in gypsum wallboard.
- G. Section 08640 - Aluminum Clad Windows and Doors: Gypsum wallboard systems installed in conjunction with and adjacent to the window and door wall systems.
- H. Section 09530 - Acoustical Treatment: Coordination of installation of acoustical insulation in designated partitions.
- I. Section 09900 - Painting: Surface preparation and painting of gypsum wallboard.

1.03 QUALITY ASSURANCE

- A. Acceptable Manufacturers: The following manufacturers are acceptable for use on this project subject to compliance with requirements:
  - 1. United States Gypsum Company
  - 2. National Gypsum Company
  - 3. The Celotex Corporation
  - 4. Substitutions for gypsum board materials and accessories in compliance with sections 01340 and 01600 will be considered by the Architect.
- B. Fire-Resistance Rating: Where gypsum drywall systems with fire-resistance ratings are indicated or are required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities, including UL.
- C. Comply with Factory Mutual "Approval Guide" where applicable.

- D. Manufacturer: Obtain gypsum board products from a single manufacturer or from manufacturers recommended by the prime manufacturer of the gypsum boards.
- E. References
  - 1. Gypsum Board Standard: Comply with applicable requirements of ANSI/ASTM C 840 for application and finishing of gypsum board, unless otherwise indicated. Refer to Paragraph 3.03 for additional requirements.
  - 2. Steel Framing Standard: Comply with applicable requirements of ASTM C 754 for installation of steel framing for gypsum board.
  - 3. Gypsum Board Terminology: GA-505 by Gypsum Association.
  - 4. Guidelines for Seismic Restraint - Direct Hung Suspended Ceiling Systems as published by the Ceilings & Interior Systems Contractors Association, latest edition. Comply with requirements the applicable seismic zone.
  - 5. ASTM E 580 - Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.

#### 1.04 SUBMITTALS

- A. Submit copies of technical data and laboratory test data, describing all materials, to the Architect in accordance with Section 01340. Submit samples upon request.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered to the job site in original unopened bundles or cartons bearing manufacturer's label. Store drywall boards on the job site above ground on level flooring in weathertight shelter and in manufacturers original unopened containers. Drywall must remain dry at all times.
- B. Submit a control joint plan for approval by the Architect prior to installation of gypsum wallboard.

### PART 2 - PRODUCTS

#### 2.01 GYPSUM WALLBOARD MATERIALS AND ASSEMBLIES

- A. Gypsum Wallboard
  - 1. Gypsum drywall at non-rated partitions shall be 5/8 inch thick with tapered edges.
  - 2. Gypsum drywall at rated partitions shall be 5/8 inch thick, type X or Fire Code C, or other as required by the Fire Resistance details in the drawings.
  - 3. Gypsum drywall used on wet walls in toilets, kitchen, sacristy, janitor's closets, and at water fountains, up to 48" high. Provide Georgia Pacific DensShield Tile Backer, or approved equal.
- B. Gypsum Sheathing as backup for Masonry Veneer, Cement Board Siding, and metal panels: 5/8" Thickness Dens-Glass Gold Firestop as manufactured by Georgia-Pacific, or approved equal.
  - 1. Fiberglass Joint Tape for Joint Treatment: 2" Wide, 10x10 woven threads per inch, self-adhering fiberglass joint tape with Dow 795 Silicone Building Sealant, or approved equal.
- C. Fasteners
  - 1. Screws for Drywall Attachment to Metal Framing: For 5/8" wallboard fastened to 25 gauge (maximum) steel framing, Type "S" screws, 1-1/4" long for single layer applications.
  - 2. Nails and Screws for Drywall Attachment to Wood Blocking and Nailers: Provide 1-1/4" GWP-54 annular-ring nails. Type W drywall screws, minimum 1-1/4" length (for single layer applications), are also acceptable for use in attachment of gypsum wallboard to wood framing and blocking construction.
  - 3. For Metal Studs to Door Frames, Runners: Type "S" and S-12 Pan Head 3/8" long.
  - 4. Fasteners for fire-rated assemblies shall be as required for that particular assembly.
  - 5. Fasteners for Gypsum Sheathing: Galvanized, Type "S" screws, 1" in length.
  - 6. See also structural engineering requirements for interior and exterior walls used for shear walls.

- D. Metal Trim Products
  - 1. Control Joint: U.S.G. No. 093, all zinc.
  - 2. Metal Trim: U.S.G. No. 200 Series, all zinc, type as recommended by manufacturer of use intended.
  - 3. Corner Bead: National Gypsum or U.S.G. No. 100 "Perf-A-Bead" and "Dur-A-Bead".
  
- E. Engineered Suspended Gypsum Board System for Flat Gypsum Board ceilings and suspension of Sound Absorptive Ceiling Panels:
  - 1. Acceptable Manufacturers:
    - a. U.S. Gypsum, 1-800-950-3839
    - b. Armstrong, 1-877-ARMSTRONG
    - c. Substitutions complying with the requirements of the project, submitted in accordance with section 01600, will be considered.
  - 2. Suspension System with seismic and expansion control as required by code and drawings.
    - a. Provide track, channels, tees, hangers, rods, connectors, anchors etc., as required to suspend ceilings as shown in drawings.
    - b. Field measuring of space required prior to submittal of shop drawings
    - c. Submit shop drawings: include calculations for weight and seismic loads, dimensions, sizes, and installation instructions. Show and size all standard and custom accessories, attachments. Show coordination with adjacent materials and systems.
    - d. Provide complete instructions, templates, layouts and other information required for proper installation of the system.
  
- F. Joint System, Interior
  - 1. "Perf-A-Tape" joint system utilizing joint compound, tape and topping compound manufactured by U.S. Gypsum or National Gypsum.
  - 2. Reinforcing Tape: "Perf-A-Tape".
  - 3. Joint Compound: All-purpose ready-mixed "Perf-A-Tape" cement.
  
- G. Joint System, Exterior
  - 1. Dow Corning 795 exterior sealant.
  - 2. Fiber glass tape, 4" wide minimum.
  
- H. Acoustical Sealant: As manufactured by United States Gypsum Company. The sealant shall be resilient, permanently flexible, shrink and stain- resistant and have long life expectancy.
  
- I. Metal Track: National Gypsum or U.S.G. drywall track to match metal studs, 25 gauge.
  
- J. Provide all necessary carriers and framing to receive items built into or recessed in gypsum wallboard partitions and ceilings.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Start of work under this section shall constitute acceptance of surfaces as satisfactory to receive work.

### 3.02 ERECTION AND INSTALLATION

- A. Gypsum drywall shall be installed in well ventilated, totally enclosed areas, with temperatures uniformly maintained within the range of 55°F to 70°F. Maintain temperature until building is occupied.
- B. Wall Assemblies: Refer to Drawings for wall types and assemblies, including fire-rated assemblies. Completed assemblies shall conform to Underwriters Laboratories, Inc. tests or other tests indicated and/or specified. Finish joints as specified herein where fire-rated assembly will be exposed to view.

C. Metal Stud Walls

1. All partitions shall be aligned accurately according to the floor plans. Floor and ceiling runners shall be securely attached at 16 inches o.c. to concrete slabs and structure above with concrete stud nails, power driven anchors or wire ties as required for a sound installation, straight, plumb and rigid.
2. Studs shall be positioned vertically in the runners, spacing as indicated on drawings. Anchor all studs to runner flanges, on each side of stud, with metal piercing lock fastener or by positive screw engagement with 3/8" Type S, pan head screws through each stud flange and runner flange.
3. All openings shall receive double studs at jambs.
4. For all doors 3'-6" or wider, provide minimum 18 gauge welded double stud (to provide rigidity of door framing), with 18 gauge track top and bottom to extend minimum of 5" from door frame.
5. Extra Metal Studs at Hollow Metal and Solid Core Doors: Provide double 18 gauge metal studs at 6" maximum from door jambs where hollow metal and solid core doors are scheduled.
6. Studs shall be located no more than 2 inches from door frame jambs, finished opening jambs, partition corners, and partition ends.
7. Studs shall be securely anchored to the jamb and head anchor clips of each door frame by bolt or screw attachment. Over metal door frames install a cut-to-length section of runner with flanges slit and web bent to allow flanges to overlap adjacent vertical studs and securely screw-attach to adjacent studs. A cut-to-length stud extending from door frame header to ceiling runner shall be positioned at vertical joints at jambs and at 16 inches o.c. across header.
8. Conditions not specifically specified in this section shall be installed as recommended by the manufacturer.

D. Supplementary Framing

1. Install framing, runners, furring, blocking, and bracing at openings and terminations in work, and at locations required to support fixtures, equipment, services, heavy trim, furnishings, and similar work which cannot be adequately supported directly upon the gypsum board alone.
2. Install framing/furring and gypsum wallboard assembly as required to conceal piping, conduit, steel, and wood framing members, etc. Finish as specified herein.

E. Gypsum Wallboard Over Metal Framing

1. Apply gypsum wallboard to supports with long dimension parallel to supports and all abutting ends and edges occurring over framing member flanges. Wallboard shall be perpendicular to furring channels at masonry walls. Wallboard of the maximum practical length shall be used to minimize end joints. All end joints shall be neatly fitted and staggered. Joints on opposite sides of the partition shall be so arranged as to occur on different studs. Wallboard shall be cut neatly to fit around all outlets and switch boxes.
2. Space 1 inch type S screws a maximum of 12 inches o.c. in the field of the board and 8 inch o.c. staggered along the vertical abutting edges. See also structural engineering documents for requirements.
3. Items such as fire extinguisher cabinets, etc., recessed in rated walls shall be backed up with the proper plies of the specified 5/8" fire-rated gypsum drywall to maintain the integrity of the fire-rated wall.
4. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4" to 1/2" space and trim edge by flat taping. Seal joints with acoustical sealant. Do not fasten drywall directly to stud system runner tracks.

F. Metal Framed Chase Wall Construction

1. Chase wall partitions shall be aligned accurately according to the partition layout. A double row of floor and ceiling runners shall be securely attached 24" on center to concrete slabs with power driven anchors.
2. A double row of metal studs shall be positioned vertically in the runners so that studs are opposite each other in pairs with the flanges pointing in the same direction. Space no greater than 24" on center. Anchor all studs to runner flanges with Metal Lock Fastener or by positive screw engagement through each stud flange and runner flange.
3. All gypsum drywall chase walls shall be cross braced at each stud. Cross bracing between rows of studs shall be metal runners, fastened to the studs with two (2) No. 8 x 1/2" self-drilling, self-tapping steel screws in each stud. Metal stud cross bracing shall be located as shown on the Drawings but in no instance over 4 feet on center.



4. Apply the specified tile backer board parallel to the studs using 1-1/4" type S drywall screws 8" on center at edges (located 3/8" from the edges) and top and bottom runners, 12" on center in field. Stagger joints 24" each side.
  5. Finish joints as specified herein.
- G. All cutting of ends and cutouts for switches or outlets, etc., within the field of the wallboard are by this Subcontractor. Locate all electrical outlets covered by this work; cutouts are not to be larger than items received and in a manner acceptable to Architect. All cutouts must be made by knife, not by hammer.
- H. Apply corner beads to all external angles. Apply casing beads where indicated on the drawings.
- I. Built-ins, etc., recessed in fire-rated walls shall be backed up with the proper number of layers of 5/8" Type X gypsum drywall to maintain the integrity of the fire-rated wall.
- J. Piping in Walls: Where piping is to run inside stud walls, cut holes in studs (do not punch tops) to align at proper height for piping. Permit installer of piping to thread piping through as work progresses.
- K. Accessories
1. Joint compound and perforated tape shall be used on all face joints and internal angles formed by the intersections of walls. Final application of joint compound shall be sanded smooth. Apply compound in three coats at screw holes, sanding between coats.
  2. Provide metal trim, corner beads and expansion joints as shown on the drawings and/or as required, in single lengths. At least two coats of joint compound shall be applied over beads and each coat feathered out onto panel faces. Control joints shall be spaced 30 feet o.c. each way, maximum, at door frames where possible. Control joints shall be installed only in walls/partitions that exceed the 30' dimension, such as an uninterrupted, continuous wall.
  3. Moisture-resistant sealant, as recommended by the drywall manufacturer shall be applied to all raw cut edges and nail heads of moisture-resistant gypsum board. Sealant shall be brush applied as directed by manufacturer.

### 3.03 FINISHING OF GYPSUM BOARD ASSEMBLIES

- A. General: Apply joint treatment at gypsum board joints (both directions), flanges of corner bead, edge trim, and control joints, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration and level of gypsum board finish indicated.
1. Prefill open joints, rounded or beveled edges, and damaged areas, using setting-type joint compound.
  2. Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.
  3. Applicable to interior and exterior gypsum board. See required materials under Section 09250, Article 2.01 above for tape, sealants, etc. for exterior and interior applications.
- B. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
1. Level 1
    - a. Joints and interior angles: Tape embedded in joint compound; surfaces free of excess compound; tool marks and ridges acceptable.
    - b. Locations: Plenum areas above ceilings, areas where assembly is concealed by final construction, smoke barriers, and separation walls in attics. Some smoke and fire assemblies require higher degrees of finish; follow those published requirements.
  2. Level 3
    - a. Joints and interior angles: Tape embedded in joint compound with one additional coat.
    - b. Fastener heads and accessories: Two separate coats joint compound.
    - c. Surfaces free of excess compound; joint compound surfaces smooth and free of tool marks and ridges.
    - d. Locations: Organ chamber walls and ceiling (if any), and mechanical rooms.
  3. Level 4
    - a. Joints and interior angles: Tape embedded in joint compound with two additional coats applied over flat joints and one separate coat applied over interior angles.
    - b. Fastener heads and accessories: Three (3) separate coats joint compound.

- c. Surfaces free of excess compound; joint compound surfaces smooth and free of tool marks and ridges.
  - d. Locations:
    - (1) Typical, unless otherwise indicated: Ceilings, soffits, and other interior horizontal surfaces receiving flat paint.
    - (2) Areas receiving flat paint.
4. Level 5
- a. Joints and interior angles: Tape embedded in joint compound with two additional coats applied over flat joints and one separate coat applied over interior angles.
  - b. Fastener heads and accessories: Three (3) separate coats joint compound.
  - c. Surfaces free of excess compound; joint compound surfaces smooth and free of tool marks and ridges.
  - d. Utilize either method for final procedure prior to final finish application:
    - (1) Roll apply batter consistency mixture of gypsum board joint compound and water to surfaces; remove immediately with wide broadknife, without leaving ridges or gouges in finished surface. Allow to dry prior to prime coat application, or;
    - (2) Apply Level 5 surfacing material at 300-500 s.f. per gallon in accordance with manufacturer's installation instructions; allow to dry.
  - e. Locations:
    - (1) Typical, unless otherwise indicated: Walls, ceiling, and pilasters receiving egg-shell, low luster, semi-gloss, or gloss finish paints.
    - (2) Other Areas: Appearance areas receiving low luster, semi-gloss, or gloss finish paints.
- C. Where Level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.
- D. For Level 4 gypsum board finish, embed tape in finishing compound plus two (2) separate coats applied over joints, angles, fastener heads, and trim accessories using one of the following combinations of joint compounds (not including prefill), and sand between coats and after last coat.
- E. Where Level 5 gypsum board finish is indicated, apply joint compound combination specified for Level 4 plus a thin, uniform skim coat of joint compound over entire surface. Use joint compound specified for the finish (third coat) or a product specially formulated for this purpose and acceptable to gypsum board manufacturer. Produce surfaces free of tool marks and ridges ready for decoration of type indicated.
- F. Allow not less than 24 hours drying time between coats.
- G. Exterior Sheathing: Apply joint treatment at gypsum board joints (both directions), flanges of corner bead, edge trim, and control joints, penetrations, fastener heads, surface defects and elsewhere as required to seal the sheathing.
- 1. See required materials under Section 09250, Article 2.01 above for tape, sealants, etc. for exterior applications.
  - 2. Prefill open joints, rounded or beveled edges, and damaged areas, using the specified sealant.
  - 3. Apply fiberglass joint tape over gypsum board joints.
  - 4. Fill joint over tape with specified sealant.
  - 5. Smooth all sealant and joints with putty knife.

### 3.04 PARTITION PERIMETER CAULKING - WALLS WITH ACOUSTICAL INSULATION

- A. Cut panels for loose fit around partition perimeter. Leave a groove no more than 1/8" wide. Apply a 1/4" minimum round bead of sealant each side of runners including those used at partition intersections with dissimilar wall construction. Immediately install panels, squeezing sealant into firm contact with adjacent surfaces. Fasten panels as specified herein. Gypsum panel joint treatment shall be as specified herein.

### 3.05 COMPLETION

- A. Leave gypsum wallboard ready to receive finish painting, as scheduled on Drawings.

### 3.06 CLEANUP

- A. At the completion of this work, remove from the site all excess materials and debris. Leave entire work ready for the application of scheduled finishes.

### 3.07 PROTECTION

- A. Installer shall advise Contractor of required procedures for protection gypsum drywall work from damage and deterioration during remainder of construction period.
- B. Touch Up: Return after application of primer but before application of top coats, to inspect surface of substrate for smoothness and damage, and repair surface or touch up joints to satisfaction of the Architect. Coordinate timing of touch up with work of painting to avoid delays in the work.
  - 1. This does not exclude other repairs or touch up work that may be included or implied by these Specifications or other parts of these Contract Documents.

END OF SECTION



SECTION 09300

TILE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of floor tile, wall tile, and tile bases.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Concrete slab as substrate for tile flooring. Concrete cutting and patching prior to tile installations.
- B. Section 07920 - Sealants and Caulking: Sealing expansion and control joints in floors.
- C. Section 09250 - Gypsum Wallboard: Completion of gypsum wallboard installations prior to commencement of tile installations.
- D. Section 09900 - Painting: Coordination of painting operations with installation of tile. Protect installed tile during painting operations.
- E. Section 10161 - Toilet Partitions and Urinal Screens: Completion of tile work prior to erection of the toilet partitions and urinal screens
- F. Section 10800 - Toilet Room Accessories: Coordination of tile installation with the installation of the toilet room accessories.

1.03 QUALITY ASSURANCE

- A. Acceptable Manufacturers: The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
  - 1. American Olean Tile Company
  - 2. Dal-Tile International
  - 3. Crossville Ceramics.
  - 4. Other manufacturers as selected by Architect.
- B. Publications: A copy of the following standards shall be kept on the job by the Contractor at all times: USAS 137.1, American National Standards Institute (ANSI) Standard Specifications; Latest Edition of Handbook for Ceramic Tile Installation by the Tile Council of America. These standards shall be referred to for tile installation.
- C. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
  - 1. Surfaces: Minimum 0.6 when wet.

1.04 SUBMITTALS

- A. Submit the following the Architect in accordance with Section 01340:
  - 1. Copy of Master Grade Certificate bearing certification mark of Tile Council of America, signed by both tile manufacturer and tile sub-contractor.
  - 2. Adhesive manufacturer's Certification of Compliance to required standard.

3. Sample panel, minimum 12", square for each color, pattern and type of tile intended to be used. Samples shall include all tile accessories. Panels shall be properly labeled on back with names of project, product and contractor. Samples shall show limit of range to be expected on the tile installation.
4. Sample marble threshold showing color, markings and finish.

B. Obtain approval of sample submittals before delivering any products to job site.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver all products to job site in manufacturer's unopened, original, standard containers with grade seals unbroken and labels intact. Keep tile cartons dry.

#### 1.06 EXTRA STOCK

- A. Supply extra 5% replacement stock of each type tile installed. Deliver to Owner in manufacturer's original cartons with labels intact. All unused stock shall also be turned over to the Owner.

### PART 2 - PRODUCTS

#### 2.01 TILE MATERIALS

- A. Tile: Provided by the Allowance specified under Section 01020, Allowances. Refer to Drawings for areas scheduled to receive tile. Two colors of tile; patterns shall be as selected by the Architect.
- B. Provide all miscellaneous shapes, special shapes, including base, outcorners, bullnoses, etc., necessary for a complete installation. All external corners shall be bullnosed (unless specified/indicated otherwise), internal corners shall be square.

#### 2.02 SETTING MATERIALS

- A. Floor Tile
1. Mortar: Laticrete Latapoxy 210 Epoxy Adhesive.
  2. Grout: Laticrete Latapoxy SP-100 Stainless Epoxy Grout.
- B. Wall Tile
1. Mortar: Laticrete MULTIMAX LITE, or Latapoxy 210 Epoxy Adhesive.
  2. Grout: Laticrete Latapoxy SP-100 Stainless Epoxy Grout.

#### 2.03 MISCELLANEOUS

- A. Crack Bridging Membrane - All Areas of Installation Where Tile is Installed Over Concrete Slab
1. Products
    - a. Strataflex anti-fracture membrane, National Applied Construction Products, Inc. of Canal Fulton, Ohio.
    - b. Nobleseal CIS crack isolation sheet, The Noble Company of Grand Haven, Michigan.
  2. Primer: As required by the slip sheet manufacturer.
- B. Sealant for application around perimeter of plumbing fixtures (waterclosets, urinals), between tile and another material, shall be white, fungicidal one-part silicone rubber sealant comparable to Dow Corning 782 or 784.
1. Refer to Section 07920 for sealant for use in floor tile control/expansion joints.
- C. Thresholds shall be Grade A Georgia Marble, thickness required to make transition between tile and adjoining surfaces, and shall comply with ASTM C-503, for exterior use and abrasion resistance. Thresholds shall be free from cracks, chips, stains or other defects, uniform in tone and coloring. Color(s) as selected by the Architect.

- D. Leveling Coat: Leveling coat shall be 1/4" thick or less and shall consist of dry set mortar to which an equal volume of a mixture of one (1) part Portland cement and 1-1/2 parts sand has been added.
- E. Brass Edging for Floor Tile where abutted to Resilient Flooring: As manufactured by Schluter System.
  - 1. Miter corners and angles. Install in longest lengths possible with closely fitted and aligned butt joints, and with horizontal leg keyed into mortar bed. Top edge shall set flush with finished floor tile. Clean, and remove mortar stains.
  - 2. Color selected by Architect.
- F. Sealant for application around perimeter of plumbing fixtures (waterclosets, urinals, etc.), between tile and another material, shall be white, fungicidal one-part silicone rubber sealant comparable to Dow Corning 782 or 784. Refer to Section 07920 for sealant for use in floor tile control/expansion joints.

## PART 3 - EXECUTION

### 3.01 PREPARATION

- A. All surfaces receiving tile shall be dry, clean, free from oily or waxy films. Do not start work until all grounds, anchors, hangers, electrical and mechanical work in or behind the tile have been installed. Inspect subfloors which are to receive tile covering. Correct defects or conditions that will interfere with or prevent a satisfactory tile installation. Do not proceed with installation until such defects or conditions have been corrected. The starting of installation work in a room or space shall imply acceptance of the surfaces to receive the tile in that space.
- B. Do not install any materials until temperature of materials and substructures have been maintained at or above 50°F minimum for a period of 24 hours.

### 3.02 INSTALLATION - GENERAL

- A. Where possible, lay out work so that no tile less than half-size occurs. For heights stated in feet and inches, maintain full courses to produce nearest attainable heights without cutting tile. Obtain exact locations of expansion joints and accessories before installing tile.
- B. Marble thresholds shall be installed at each door opening where tile begins. Install each threshold in a bed of mortar and set as indicated on the Drawings. One piece of marble will be used for each threshold. Notch thresholds at door jambs to follow profile of door frame.
- C. After tile work and grout is dry, apply continuous sealant in tile control joints, perimeter of waterclosets, perimeter of urinals, where tile butts ceilings and where tile butts other materials.
- D. As the work progresses, all surfaces shall be cleaned with burlap. Upon completion scrub the entire installation with fiber brushes and water. Do not use acid or metal scrapers. Before traffic is permitted over finished tile work, cover the floors with untreated building paper or board walkways. Cracked, broken or damaged tiles shall be removed and replaced prior to Substantial Completion Inspection.

### 3.03 TILE INSTALLATION

- A. Comply with the following from Tile Council of America Handbook Standards
  - 1. Floors, interior, concrete:
    - a. F113; Dry-set Mortar or Latex-Portland Cement Mortar.
    - b. F115; Dry-set Mortar, Epoxy Grout.
    - c. Floors, Interior, Concrete, Epoxy Mortar and Grout: F131; Epoxy Mortar and Grout.

### 3.04 FLOOR CONTROL/EXPANSION JOINTS

- A. Floor tile shall be aligned to show uniform joints and then allowed to set until firm. Tile shall be set with all joints in alignment and shall be uniform and true, maintained straight from wall to wall, uniform in width for entire length of wall in either direction.
- B. Provide expansion and control joints over control and expansion joints in substrate (floors). Provide expansion joint at tile perimeter abutting walls. Consult with Architect before constructing any control and expansions joints for location verification. Expansion or control joints shall be 1/4 inch wide, through the tile and bed, shall be provided and constructed as recommended by the Tile Council of America, Inc., as specified hereinbefore.
  - 1. Joints shall be sealed with sealant not less than 1/4 inch deep.
  - 2. Sealant type and color shall be approved by Architect prior to installation.

### 3.05 REPAIR

- A. Any loose, uneven, or misaligned tile shall be removed and reinstalled at no additional expense to the Owner.

### 3.06 CLEANUP AND PROTECTION

- A. Remove all excess materials and debris from the job site. Leave entire work in a neat condition ready for Substantial Completion Inspection.
- B. Protect the completed installations of the tile from damage until the Date of Substantial Completion. Any tile damaged during this period of time shall be replaced at no expense to the Owner.

END OF SECTION



## SECTION 09510

### ACOUSTICAL TILE AND GYPSUM CEILING SYSTEMS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes: Materials and installation of suspended, lay-in ceiling systems.

##### 1.02 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Metal framing / metal fabrications for supplemental supports for the ceiling systems.
- B. Section 09250 - Gypsum Wallboard: Completion of drywall partition construction prior to installation of ceiling systems.
- C. Section 09530 - Acoustical Treatment: Some ceilings to receive sound batt insulation above lay-in. See drawings.
- D. Section 09900 - Painting: Coordination of painting operations with the installation of the ceiling system. Protection of ceiling systems during painting operations.
- E. Division 22 - Plumbing: Coordination of ceiling installations with mechanical apparatus installed in ceiling system. Provide additional supports as required.
- F. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Coordination of ceiling installations with HVAC apparatus installed in ceiling system. Provide additional supports as required.
- G. Division 26 - Electrical: Coordination of ceiling installations with light fixture installation and other electrical apparatus. Provide additional supports as required.

##### 1.03 QUALITY ASSURANCE

- A. Reference Standards - Materials and installation shall comply with the following:
  - 1. Suspension system shall comply with ASTM C 635, "Standard Specification for Metal Suspension Systems for Acoustical and Lay-In Panel Ceilings.
  - 2. Installation of ceiling system shall comply with ASTM C 636, "Recommended Practice for Installation of Acoustical Tile and Lay-In Panels".
  - 3. Guidelines for Seismic Restraint - Direct Hung Suspended Ceiling Systems as published by the Ceilings & Interior Systems Contractors Association, latest edition for the applicable seismic area. Comply with requirements for the applicable seismic loading.
  - 4. ASTM E 580 - Application of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Requiring Seismic Restraint.
- B. Installer Qualifications: Firms with not less than three (3) years of successful experience in installation of acoustical ceilings similar to requirements for this project.
- C. Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, and partition systems.

- D. Acceptable Manufacturers: The following manufacturers are acceptable for use on this project subject to compliance with project requirements:
1. Armstrong Ceiling Systems.
  2. USG Interiors, Inc.
  3. The Celotex Corporation.

#### 1.04 SUBMITTALS

- A. Submit copies of technical data, shop drawings and two (2) 12" x 12" physical samples of each type ceiling tile proposed for installation. Submit to the Architect in accordance with Section 01340.
- B. Extra Stock: Furnish one (1) carton/box of each type ceiling tile installed. Cartons/boxes shall be labeled identifying the type ceiling tile. Excess ceiling materials shall be boxed, labeled and turned over to the Owner; refer to Section 01700.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Care shall be taken in handling all portions of the ceiling during transportation and at the job site. All material must arrive at the job site packed in heavy, unopened cartons bearing the manufacturer's labels. Store material under cover, in a dry location and in a manner to prevent damage. Broken, chipped or cracked panels shall not be installed.

### PART 2 - PRODUCTS

#### 2.01 CEILING TILE

- A. Acoustical Ceiling Tile
1. Type 1 (Typical 2x4 ceilings): Armstrong Ultima Tegular, size shown in plans, designed for installation with a 9/16" exposed tee system. The ceiling tile shall have the following features: NRC of 0.70, a CAC of 35 and a light reflectance of 0.89.
  2. Type 2 (Safe Room ceilings): USG Halcyon, 1-1/2" thick, size shown in plans, for installation in 9/16" exposed tee system. The ceiling tile shall have the following features: NRC of 1.00, a CAC of 25 and a light reflectance of 0.90, R-value of 6.6.
  3. Type 3 (Kitchen and Toilets): Armstrong Clean Room VL, size shown in plans, designed for installation with a 9/16" exposed tee system. The ceiling tile shall have the following characteristics: NRC of 1.00, a CAC of 40 and a light reflectance of 0.83.

#### 2.02 SUSPENSION SYSTEMS

- A. Suspension System, Intermediate Duty: Mechanical suspension system shall be exposed grid design, pre-painted low-sheen white.
1. The suspension system for Acoustical Lay-In Ceilings shall be formed from commercial quality cold-rolled steel electro-galvanized coated with the following components:
    - a. Main tee with a double web design with a rectangular bulb, with exposed flange with rolled cap. The suspension system shall have integral reversible splice.
    - b. Cross tee with double web design and with a rectangular bulb; with web extending to form a positive interlock with main tee; with the lower flange extended and offset.
    - c. Wall molding with an angle shape.
    - d. Accessories: Clips, Splice Plates, and other accessories required for complete installation.
    - e. Hanger wires shall be Class 1 zinc coating, soft temper, pre-stretched, having a yield stress load of at least three (3) times design load, but not less than 12 gauge. Comply with ASTM A 641.
    - f. Color shall be white.

2. Suspension System for suspended drywall shall be by USG Drywall Suspension Systems.
  - a. Main Tees: Fire-Rated Heavy-Duty classification 1.617" high x 144" long, integral reversible splice with knurled face. (DGLW-26 1-1/2" Face and 1.617" high)
  - b. Cross Members: Fire-Rated members with knurled face. Cross Tees: DGLW-424 cross tee 1-1/2" high x 48" long with 1-1/2" wide face; DGLW-224 Fire-Rated: 1-1/2" high x 24" long with 1-1/2" face
  - c. Quick release cross tee ends for positive locking and removability without tools
  - d. Accessory Cross Tees: Cross tees must have knurled faces and quick release cross tee ends for positive locking and removability without tools.
  - e. Wall Moldings: Single web with knurled face
  - f. Accessories: Clips, Splice Plates, and other accessories required for complete installation.
  - g. Wire: Hanger Wire 12 ga., galvanized or as noted on drawings

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Acoustical material shall be installed under conditions as outlined in the current bulletin of the Acoustical Materials Association. All areas to receive suspended acoustical ceiling shall be broom cleaned and uninterrupted for free movement of scaffolding.
- B. The suspension system shall support the ceiling assemblies with a maximum deflection of 1/360 of the span. Space main tee suspension members 4'-0" o.c. Space hanger for main tees not more than 6" from the end, and not more than 4'-0" o.c., across the length. Provide additional hangers as necessary for support of fixtures (one wire at each corner of each fixture) and other items so as not to cause excessive deflection and at each side of suspension system splices. Support main tees only from hangers. Do not bear on walls or partitions. Do not suspend system from conduits, pipes, roof deck, ducts, etc. Hang only from structure and/or supplemental framing. Support cross runners from main runners. Interlock ends of cross runners with main runners. In all cases, the ceiling assembly shall be level 1/8".
  1. Install additional hanger wires, splay hangers or other means of seismic restraint as required to meet the requirements of ASTM E 580 and the requirements of the applicable seismic code. Do not attach hangers to piping, conduit, duct or decking. Provide carrying trapeze support where obstruction cannot be avoided by splaying hanger 45 degrees from vertical or less.
- C. Install moldings at walls, partitions, columns, pipes and other obstructions that extend through and above the ceiling system. Securely attach moldings with appropriate fastening devices spaced not over 16" o.c.
- D. Install panels to rest on flanges of inverted tees with board units fitting neatly against abutting surfaces and supported by wall angels, as applicable. Balance border areas to avoid units less than 1/2 unit width wherever possible.
- E. Install hold-down clips in accordance with applicable code requirements.

### 3.02 CLEANING AND PROTECTION

- A. Upon completion of the ceiling installation, remove from the job site all excess materials and debris. Clean ceiling tiles prior to Substantial Completion Inspection.
- B. Protect completed installations until the date of Substantial Completion. Remove and replace any tiles which are and that have become discolored or damaged, at no expense to the Owner.

END OF SECTION



## SECTION 09530

### ACOUSTICAL TREATMENT

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes materials and installation of:
  - 1. Acoustical blanket type insulation in wall assemblies.

##### 1.02 RELATED SECTIONS

- A. Section 09250 - Gypsum Wallboard: Sound attenuation blankets installed in conjunction with the gypsum wallboard system. Wall mounted absorption panels installed over complete gypsum wallboard assemblies.
- B. Section 09900 - Painting: Coordination of the painting operations with the installation of the wall mounted absorption panels.
- C. Section 10520 - Fire Extinguishers, Cabinets, and Accessories: Coordination of panels with fire extinguisher cabinets.

##### 1.03 QUALITY ASSURANCE

- A. Fire Ratings: Comply with fire-resistance, flammability and insurance ratings indicated, and comply with regulations as interpreted by governing authorities. A flame spread of 25 and smoke developed of 25 shall not be exceeded when tested in accordance with ASTM E 84.
- B. Sound Transmission Ratings: Install acoustical insulation to provide indicated STC ratings when tested per ASTM E 90.
- C. Single Resource Responsibility: Obtain wall mounted absorption panels system, accessories, and mounting hardware from a single manufacturer.

##### 1.04 SUBMITTALS

- A. Submittals shall be in accordance with Section 01340.
- B. Product Data: Submit manufacturer's material specifications and installation instructions including instructions for handling, storage, protection, and maintenance.

##### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver acoustical products in manufacturer's original, unopened wrappings, with labels intact. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow (whether in storage or in place). Store in a dry place with adequate air circulation. Do not deliver materials to building until "wet work", such as concrete, has been completed and cured to a condition of equilibrium. Comply with manufacturer's recommendations for handling, storage, and protection during installation. Remove from the job site all materials found to be wet or that has been previously wet or soiled.

##### 1.06 PROJECT CONDITIONS

- A. Do not begin installation until spaces to receive acoustical wall systems have been enclosed and maintained at approximately same humidity and temperature conditions as planned for occupancy.

- B. Maintain temperature and humidity as recommended by manufacturer.

## PART 2 - PRODUCTS

### 2.01 SOUND ATTENUATION BLANKETS

- A. Thermafiber SAFB (Sound Attenuation Fire Blankets), manufactured by Owens Corning, paperless, 3" thickness, 2.5 pounds per cubic foot density, or equal product by other manufacturer approved in advance. Provide widths for tight fit between framing members.

## PART 3 - EXECUTION

### 3.01 INSTALLATION OF SOUND ATTENUATION BLANKETS

- A. Partitions: Install blankets in full height in stud cavities in all assemblies as indicated in drawings. Batts shall be friction fit between the framing. Install batts full height of partitions leaving no voids or spaces exposed. Fit batts behind electrical outlet boxes, pipes and other items placed in walls. Butt ends of blankets together, and fill all voids. Stuff insulation into all cracks and joints to provide a full layer of material.
- B. Ceilings: Friction fit between framing or tightly butted. Leave 6" clear around lights and junction boxes or other heat producing elements.
- C. Where friction fitting in wall assemblies is impractical, use a pistol type hand stapler and attach blanket to back of gypsum panel at each corner at least 2" from edges and in center of blanket. Use paper washer or staple over a 6d nail laid flat on the blanket to prevent the staple from pulling through the blanket.
- D. Hold insulation back a minimum of 3" from recessed light fixtures and/or other heat generating apparatus which are built into the wall systems.

### 3.02 CLEANUP

- A. Upon completion of the installation of the insulation, remove from the site all excess materials and debris and leave ready for the next sequence of work to be performed.

### 3.03 PROTECTION

- A. Protect wall mounted absorption panels from damage until date of Substantial Completion. Remove and replace panels that are damaged, soiled and are otherwise unacceptable to the Architect.

END OF SECTION

SECTION 09660  
RESILIENT FLOORING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of:
  - 1. Resilient floor tile.
  - 2. Resilient base.
  - 3. Luxury Vinyl Tile.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Floor slab as substrate for resilient flooring.
- B. Section 09250 - Gypsum Wallboard: Completion of gypsum wallboard partitions prior to installing flooring and base.
- C. Section 09300 - Tile: Coordination of the tile installation with the installation of the resilient base.
- D. Section 09900 - Painting: Coordination of painting operations with resilient flooring and base installations. Protection of resilient flooring and base during painting operations.

1.03 SUBMITTALS

- A. Tile and base samples of each color selected, samples of accessory items, and manufacturer's product data for adhesive(s) shall be submitted to the Architect in accordance with Section 01340.
- B. Submit bound copies of maintenance manuals describing the care of installed materials. Refer to Section 01700.
- C. Extra Stock - Submit in accordance with Section 01700:
  - 1. Furnish not less than 200 square feet of each type, size, pattern, and color installed. Materials shall be from the same run as the installed tile. Provide a minimum of 20 linear feet of base, roll stock only. Such items shall be provided in unopened cartons for Owner's maintenance requirements.

1.04 QUALITY ASSURANCE

- A. Acceptable Manufacturer - Floor Tile: The following manufacturer is for establishing quality and performance. Other manufacturers are acceptable for use on this project subject to compliance with project requirements.
  - 1. Armstrong World Industries, "Excelon Imperial Texture".
  - 2. Substitutions in accordance with Section 01600.
- B. Acceptable Manufacturer - Base, Stair Treads, Risers: The following manufacturers are acceptable for use on this project, subject to compliance with project requirements.
  - 1. Johnsonite of Chargin Falls, Ohio
  - 2. Substitutions in accordance with Section 01600.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials in manufacturer's original, unopened packaging. Containers shall indicate manufacturer's brand name, color and pattern and production run color code. Protect materials against damage and freezing. Store resilient flooring materials in spaces where they will be installed for at least 48 hours before beginning installation.

## 1.06 ENVIRONMENTAL REQUIREMENTS/JOB CONDITIONS

- A. Maintain minimum temperature of 65°F in spaces to receive the resilient flooring, for at least 48 hours prior to installation, during installation and for not less than 48 hours after installation. Subsequently, maintain minimum temperature of 55°F in areas where work is completed.
- B. Moisture content of floor slabs at time of installation shall be 5% or lower.
- C. Surface pH of concrete slab shall be no greater than 9.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Resilient Floor Tile: 12"x12"x1/8" thick vinyl composition. Floor tile shall meet the following requirements:
  - 1. Shall be asbestos free.
  - 2. Flame Spread Rating: 75 or less by ASTM E 84.
  - 3. Smoke Density: Less than 450 by ASTM E 662.
  - 4. Critical Radiant Flux: 0.45 minimum by ASTM E 468.
  - 5. All vinyl tile shall be from the same batch number to the extent possible. Tile shall have a uniform disbursement of color and texture throughout the thickness of the tile. Comply with ASTM F 1066, non-asbestos formulated.
- B. Base
  - 1. Rubber: 4" high, coved at resilient flooring and straight at areas of carpet installation, roll stock only. Provide premolded interior and exterior corners. Wrapping of corners will not be permitted. Mitered interior corners will not be permitted.
  - 2. Resilient Wall Base: Masquerade Series, as manufactured by Johnsonite/Tarkett, profiles and heights as shown in the drawings.
    - a. Install with Tarkett Cove Base Adhesive.
- C. Resilient edging strips required, shall be the beveled type and shall match flooring. Provide the following as manufactured by Mercer Plastics Company.
  - 1. Resilient Flooring to Concrete: #633 "Tile Reducer".
  - 2. Resilient Flooring to Carpet: #400 "Custom Edge".
  - 3. Carpet Edge Reducer: #160 "Universal Reducer".
- D. Adhesives: As recommended by the base and flooring manufacturers.
- E. Primer, Crack Fill and latex leveling compound as recommended by the tile and manufacturers for the material and substrate involved.
- F. Cleaner and wax shall be as recommended by the resilient flooring manufacturer.

### 2.02 LUXURY VINYL TILE

- A. Luxury Vinyl Tile: COREtec Plus, as manufactured by US Floors.
  - 1. 5" x 8" plank flooring with 0.5 mm wear surface.
  - 2. Manufacturer's adhesive for direct gluing to concrete floor.
  - 3. Manufacturer's setting and tapping blocks.
- B. Transition Strip: See Section 09300 - Tile.



## PART 3 - EXECUTION

### 3.01 COORDINATION

- A. Installations shall not begin until the work of all other trades, including painting, has been completed or near completion.

### 3.02 EXAMINATION OF SURFACE

- A. Examine the substrates for the purpose of determining their fitness to receive the floor tile and base. If the substrate is found to be not in proper condition, notify the General Contractor before proceeding with the laying of the floors. No flooring or base shall be installed until all defects in the substrates have been corrected. No floors shall be installed over areas that have been treated with chemical compounds without approval of the adhesive manufacturer.

### 3.03 INSTALLATION

- A. Preparation: After the floors have been thoroughly cleaned of all foreign matter, apply a thin film of adhesive and spread evenly with a cement finisher's trowel with notched edges as recommended by the tile manufacturer. Prime concrete floor areas as recommended by the floor tile manufacturer.
- B. Floor Tile: Tile shall be laid, starting in the center of the rooms/areas, worked towards the wall with no borders, except at doors where tile color changes. The tile shall be laid in pattern as indicated/scheduled, with each tile laid tightly abutting the adjacent tile. Install tile flooring in checkerboard pattern where no special pattern is indicated or scheduled. Do not use less than 1/2 tile in either direction. Each tile shall be thoroughly cemented in place.
- C. Edging Strips: At all door openings having floors of other material and where no threshold is provided, install the specified edging strip.
- D. Resilient Base: The resilient base shall be applied, making certain that all parts are neatly secured to the wall. Butt joints shall be tight, flush and even.
- E. Linoleum Installation: Install rolls in a common area using the same register number. Install rolls in numerical order according to sequence number. Reverse alternate sheets during installation. Underscribe and heat weld all seams. Rout seams with hand or electric router. Heat weld with color matched welding tread, of thickness recommended by manufacturer.

### 3.04 CLEANING/FINISHING

- A. Cleaning of the resilient flooring materials and base shall be done in accordance with the flooring manufacturers' recommendations.
- B. After cleaning of the resilient flooring, apply a minimum of five (5) coats of plastic floor finish or wax, as recommended by the flooring manufacturer. Each coat shall be buffed to a lustrous finish.

### 3.05 PROTECTION

- A. Protect newly installed flooring with layers of undyed and untreated building paper. Do not allow traffic across the newly installed flooring. Protect installations until the date of Substantial Completion.

END OF SECTION



## SECTION 09900

### PAINTING

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes furnishing and application of painting materials to surfaces, including:
  - 1. Surface preparation of all surfaces to be painted. Paint all surfaces (interior and exterior) as applicable.
  - 2. Touching up of prime coats and other preparation necessary prior to finish painting.
  - 3. Painting, staining and otherwise finishing of new surfaces as indicated/scheduled on the Drawings and specified in this and other Sections of this Project Manual.
- B. "Paint" as used herein means all coating systems materials including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
- C. 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 or materials 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, Architect will select these colors from standard colors or finishes available.

##### 1.02 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Surface preparation and painting of concrete surfaces.
- B. Section 04200 - Reinforced Unit Masonry: Painting and staining of masonry walls and partitions.
- C. Section 05120 - Structural Steel Framing: Painting of exposed steel members.
- D. Section 05500 - Metal Fabrications: Painting of exposed metal items.
- E. Section 06200 - Finish Carpentry: Painting, staining and otherwise finishing of finish carpentry items.
- F. Section 07920 - Sealants and Caulking: Coordination of sealant and caulking installation with application of paint.
- G. Section 08100 - Hollow Metal Doors and Frames: Surface preparation and painting of all hollow metal work.
- H. Section 08210 - Wood Doors: Surface preparation and painting/staining of wood doors.
- I. Section 08710 - Finish Hardware: Installation of hardware items after finish painting is complete.
- J. Section 09250 - Gypsum Wallboard: Surface preparation and painting of gypsum wallboard systems.
- K. Division 22 - Plumbing: Painting of mechanical equipment exposed to view and exposed to weather.
- L. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Painting of HVAC equipment exposed to view and exposed to weather.
- M. Division 26 - Electrical: Painting of electrical equipment exposed to view and exposed to weather.

### 1.03 QUALITY ASSURANCE

- A. Acceptable Manufacturers - The following manufacturers are acceptable for use on this project subject to compliance with requirements:
  - 1. Sherwin-Williams Company of Cleveland, Ohio.
  - 2. PPG Industries, Inc./Pittsburgh Paint Division of Pittsburgh, Pennsylvania.
  - 3. Farrell-Calhoun Paint of Memphis, Tennessee.
  - 4. Porter Paints, Porter International of Louisville, Kentucky.
- B. Single Source Responsibility: Provide primers and other undercoat paint produced by same manufacturer as finish coats. Use only thinners approved by paint manufacturer, and use only within recommended limits.
- C. Coordination of Work: Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings systems for various substrates. Upon request from other trades, furnish information or characteristics of finish materials provided for use, to ensure compatible prime coats are used.
- D. Acceptable Surfaces: The paint contractor and General Contractor shall be solely responsible for determining that the wall is ready and suitable to be painted.

### 1.04 SUBMITTALS

- A. Submit color chips and manufacturer's product data to the Architect for color selection and product review. Submittals shall include spread and coverage rate per coat.
- B. After initial selections, submit 8-1/2" x 11" drawdowns of colors, for Architect's approval. Submit two (2) sets.

### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver products and materials in original unbroken containers with legible labels intact bearing manufacturer's brand and name with application instructions printed thereon. Paint shall arrive on the job ready mixed, except for tinting of undercoats and possible thinning as recommended by manufacturer.

### 1.06 JOB CONDITIONS

- A. Inspection of Surfaces: The painting contractor shall be responsible for inspecting the work of others prior to the application of any paint or finishing material. If any surface to be finished cannot be put in proper condition for finishing by customary cleaning, sanding, and puttying operations, the painting contractor shall immediately notify the General Contractor in writing or assume responsibility for and rectify any unsatisfactory finish resulting.
- B. Environmental Requirements: Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied. Do not apply finish in areas where dust is being generated.
- C. Protection: All materials used on the job shall be stored in a single place designated by the Contractor. Such storage place shall be kept neat and clean. All damage to the storage area and its surroundings shall be repaired. Any soiled or used rags, waste and trash must be removed from the building every night, and every precaution taken to avoid the danger of fire.
- D. Protect surfaces and objects inside and outside the building, as well as the grounds, lawns, shrubbery, and adjacent properties against damage. The painting contractor shall hold himself responsible for damage to adjacent furnishings.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. All paint and primer applied in the field shall be the products of a single manufacturer. For the purpose of clarification, only the products of one manufacturer have been listed herein.
- B. Extra Stock: Supply an extra 2% of total quantity of each paint used with a minimum of three (3) gallons of each paint. Furnish in manufacturer's unopened, labeled containers for Owner's use.

### 2.02 PAINTING SCHEDULES

#### A. Exterior Painting Schedule

- 1. Galvanized Metal, Including Galvanized Steel Lintels, Weather Exposed HVAC and Electrical Equipment: Paint steel lintels to match color of brick header. Paint all roof vents and penetrations to match color of flat roof finish.
  - a. First coat: SW Galvite B50W3 Series, DFT mils: 2.  
Omit first coat on items where compatible factory primer has been applied.
  - b. Second and third coats: SW Industrial Enamel B54 Series, DFT mils: 2.5, each coat.
- 2. Ferrous Metals, Including Weather Exposed HVAC and Electrical Equipment: Paint all roof vents and penetrations to match color of flat roof finish.
  - a. First coat: SW Kem Kromik Metal Primer B50 Series, DFT mils: 3.  
Omit first coat on items where compatible factory primer has been applied.
  - b. Second and third coats: SW Industrial Enamel B54 Series, DFT mils: 2.5, each coat.
- 3. Copper/Aluminum, Including Weather Exposed HVAC and Electrical Equipment: Paint all roof vents and penetrations to match color of flat roof finish.
  - a. First coat: SW Zinc Chromate Primer B50Y1 Series, DFT mils: 3.
  - b. Second and Third coats: SW Industrial Enamel B54 Series, DFT mils: 2.5, each coat.
- 4. Weather Exposed Ferrous Piping: Paint all roof vents and penetrations to match color of flat roof finish.
  - a. First coat: SW Kem Kromik Metal Primer B50W1 Series, DFT mils: 3.
  - b. Second and Third coats: SW Silver-Brite Aluminum B59S11 Series, DFT mils: 1 per coat.
- 5. Masonry and Concrete
  - a. First coat: SW Heavy Duty Block Filler B42W46 Series, DFT mils: 10.
  - b. Second and Third coats: SW A-100 Gloss, Latex House Paint A8 Series, DFT mils: 1.4, each coat.
- 6. Fiber Cement Board, Trim, Etc.
  - a. Follow manufacturer's printed instructions for surface preparation and application of the coating. Spray equipment must be specifically designed for aggregate coatings application.
  - b. First coat: SW Loxon primer for fiber cement board
  - c. Apply two (2) coats, 50 sq. ft. per gallon SW exterior latex enamel. If additional coat is required to uniformly cover the surface, apply such coat at no additional cost to the Owner.
- 7. Painters Caulk - Acrylic/Silicone
  - a. White, Paintable caulking compound, ASTM C 834.
- 8. Clear Sealer for Split Face masonry units and associated concrete
  - a. DRYLOK Protector Clear Low Sheen Penetrating Sealer

#### B. Interior Painting Schedule

- 1. Galvanized Metal
  - a. First coat: SW Galvite B50W3 Series, DFT mils: 2.  
Omit first coat on items where compatible factory primer has been applied.
  - b. Second and third coats: SW Industrial Enamel B54 Series, DFT mils: 2, each coat.
- 2. Ferrous Metals - Semi-Gloss Enamel
  - a. First coat: SW Kem Kromik Metal Primer B50 Series, DFT mils: 3.  
Omit first coat on items where compatible factory primer has been applied.
  - b. Second and third coats: SW Industrial Enamel B54 Series, DFT mils: 2, each coat.

3. Gypsum Drywall - Gloss Enamel Finish - Restrooms, Kitchen
  - a. First coat: SW ProMar 200 Latex Wall Primer B28 Series, DFT mils: 1.5.
  - b. Second and Third coats: SW ProMar 200 Alkyd Semi-Gloss Enamel B34 Series, DFT mils: 2, each coat.
4. Gypsum Wallboard - Flat Finish - Typical Walls and Ceilings
  - a. First coat: SW ProMar 400 Latex Wall Primer, B28 Series, DFT mils: 1.1.
  - b. Second and Third coats: SW ProMar 200 Latex Flat Wall Paint, B30 Series, DFT mils: 1.4.
5. Gypsum Wallboard - Eg-Shel Enamel Finish - Corridors, Offices, Classrooms, etc.
  - a. First coat: SW ProMar 200 Latex Wall Primer B28 Series, DFT mils: 1.4.
  - b. Second and Third coats: SW ProMar 200 Alkyd Eg-Shel Enamel B20 Series, DFT mils: 1.8, each coat.
6. Gypsum Wallboard - Semi Gloss Enamel Finish - Gypsum board pilasters
  - a. First coat: Kelly-Moore 970 Acry-Plex.
  - b. Second and Third coats: Kelly-Moore 1680 High Gloss Enamel
7. Wood - Semi-Gloss Enamel Finish
  - a. First coat: SW ProMar 200 Alkyd Enamel Undercoater B49W200 Series, DFT mils: 2.
  - b. Second and Third coats: SW ProMar 200 Alkyd Semi Gloss Enamel B34 Series, DFT mils: 2, each coat.
8. Wood - Open Grain and Close Grain - Stained Finish
  - a. AWI Premium Grade for all stained finished woodwork and doors, stain color chosen by Architect.
  - b. AWI Premium Grade, System TR-6, Catalized Polyurethane, with reduced vinyl sealer washcoat, filled finish, stain and minimum three (3) top coats.

## PART 3 - EXECUTION

### 3.01 COOPERATION WITH OTHER TRADES

- A. This work shall be scheduled and coordinated with other trades and shall not proceed until other work and job conditions are as required to achieve satisfactory results.

### 3.02 GENERAL REQUIREMENTS

- A. Before starting any work, surfaces to receive paint finishes shall be examined carefully for defects which cannot be corrected by the procedures specified herein and which might prevent satisfactory painting results. Work shall not proceed until such damages are corrected.
- B. Secure approval of color samples before applying any paint or finish. All priming coats and undercoats shall be tinted to the approximate shade of the final coat.
- C. Start of painting shall be construed as acceptance of the surfaces to receive paint or other finish.
- D. Maintain temperature in building at constant 65°F, or above, and provide adequate ventilation for escape of moisture from building in order to prevent mildew, damage to other work and improper drying of paint. Once painting has commenced, provide constant temperature of 65°F, or above, and prevent wide variation in temperature which might result in condensation on freshly painted surfaces.
- E. Surfaces to receive work described in this section shall be smooth, even, sound, thoroughly clean and dry and free of defects which would adversely affect application of this work. Surfaces which do not meet the tolerances or quality requirements imposed within the specifications governing substrate construction, shall be repaired or replaced prior to initiating this work.
- F. All materials shall be mixed, thinned, modified, and applied only as specified by the manufacturer's direction on the container.
- G. Application shall be sufficiently heavy to achieve pleasingly uniform color and lucid effect; matching approved sample.

- H. All coats shall be thoroughly dry before applying succeeding coats.
- I. Inspection of Coats: Notify the Architect for inspection between coats at least 24 hours in advance. The number of coats specified are intended to provide full coverage. Satisfactory coverage subject to the approval of the Architect. Additional coat or coats will be required by the Architect if these coats do not give sufficient coverage. Final coat shall match approved sample panel.

### 3.03 PREPARATION OF SURFACES

#### A. General

1. Surfaces shall be clean, dry and adequately protected from dampness.
2. Surfaces shall be smooth, even and true to plane.
3. Surface shall be free of any foreign material which will adversely affect adhesion or appearance of applied coating.
4. Remove all loose, spalling paint from previously painted surfaces utilizing wire brushes, pressure washing or mechanical means, as required to provide a smooth and sound substrate for the application of new paint.
5. Mildew shall be removed and neutralized by scrubbing affected areas thoroughly with a solution made by adding two ounces of Tri-Sodium Phosphate and eight ounces of Sodium Hypochloride (Clorox) to one gallon warm water. Use a scouring powder if necessary to remove mildew spores. Rinse with clear water and allow to dry before painting.

#### B. Gypsum Wallboard

1. Fill narrow, shallow cracks and small holes with spackling compound.
2. Rake deep, wide cracks and deep holes.
  - a. Dampen with clear water.
  - b. Fill with thin layers of drywall joint cement.
3. Allow to thoroughly dry.
4. Sand smooth. Do not raise nap of paper on wallboard.

#### C. Wood and Fiber Cement Products

1. Clean soiled surfaces with alcohol wash.
2. Except where rough exterior surface is specified, sand to smooth and even surface, then dust or vacuum.
3. Apply shellac to all knots, pitch and resinous sapwood before priming coat is applied.
4. Fill nail holes, cracks, open joints and other defects with wood filler or lead putty as required after priming coat has dried. Filler material must be compatible with finish being applied. Color to match finish color.

#### D. Preparation of Ferrous Metal Surfaces

1. Remove rust, mill scale and defective paint down to sound surface or bare metal, using scraper, sandpaper, or wire brush as necessary. Grind if necessary to remove shoulders at edge of sound paint to prevent flaws from photographing through finish coats.
2. Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
3. Touch-up all bare metal and damaged shop coats with specified rust-inhibitive primer.
4. Necessary touching up of shop primer shall be done on ferrous metal surfaces of all items installed adjacent to concrete prior to any openings between metal surface and adjacent surfaces being filled in or caulked.

#### E. Preparation of Galvanized Metal Surfaces

1. Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
2. All galvanized steel surfaces shall be pre-treated with proprietary acid-bound resinous or crystalline zinc phosphate preparations used according to the manufacturer's directions prior to painting.

#### F. Preparation of Masonry and Concrete Surfaces

1. Masonry surfaces must be free from dirt, loose or excess mortar, and be thoroughly dry. Perform moisture test prior to application of paint over any masonry surface. Moisture content must be within range recommended by paint manufacturer for the application involved.
2. Point all open mortar joints; fill all holes with mortar.

3. Comply with requirements set forth in Section 03300 for patching and repairing of concrete surface irregularities prior to application of any paint materials.

G. Preparation of Aluminum Surfaces: Remove dirt and grease with mineral spirits, and wipe dry with clean cloths.

H. Preparation of Copper Surfaces

1. Buff or polish surfaces to bright color.
2. Remove dirt and grease from surface with a mild phosphoric acid. Wipe dry with clean cloths.
3. Apply finish while surface is clean and bright.

### 3.04 APPLICATION

A. General

1. Protection of Adjacent Surfaces and Mixed Items
  - a. The Contractor not only shall protect his work at all times, but shall also protect all adjacent work and materials by dropcloth, covering or other methods during progress of his work.
  - b. Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work, and similar items, or provide ample in-place protection. Upon completion of each space, carefully replace all removed items. This work shall be done only by skilled mechanics.
  - c. Remove electrical panel box covers and doors before painting wall. Paint separately and reinstall after paint is dry.
2. The undercoats of paint and enamel shall be of approximate shade of the final coat. All metal surfaces calling for enamel or varnished finish shall first have priming coat well sanded, and shall be sanded between coats with fine sandpaper or steel wool that will produce an even, smooth finish. Each coat shall be perfectly dry before applying succeeding coats.
3. Do not apply initial coating until moisture content of surface is within limitations recommended by paint manufacturer. Test with moisture meter. Exterior surfaces shall not be painted in damp, frosty, or cold weather. Latex paints shall not be applied when surface or air temperature is below 50°F.
4. Surfaces shall be finished the same as nearest or adjoining surfaces unless otherwise shown.
5. Exposed access doors or panels, exposed electric panelboard covers, exposed pipes, ducts and raceways shall be painted the same color as adjacent surfaces. All piping exposed in finished areas shall be painted as required for interior ferrous metal. Where galvanized pipe occurs, prime galvanized surface as specified.
6. Hardware and accessories, fixtures and similar items placed prior to painting shall be removed or protected during painting, replaced on completion of painting.
7. Remove silencers from metal door frames prior to painting. Afterwards, replace silencers.
8. The tops, bottoms and edges of all doors to be painted shall be finished to match the surface of the doors after the hardware has been attached. Any door found unpainted upon the completion of the painting work shall be taken down and painted.
9. Any exposed metal such as chairs, nails or tie wires in reinforced concrete slabs shall be covered with a rust inhibitive material.
10. All weather exposed HVAC and electrical equipment shall be painted.

### 3.05 FIELD QUALITY CONTROL

- A. The first finished area or item of each color scheme required shall be reviewed by the Architect for color, texture, and workmanship.
- B. First acceptable area or items shall be used as project standard for each color scheme.

### 3.06 CLEANUP

- A. During progress of the work, keep areas free from any unnecessary accumulation of tools, equipment and surplus materials and debris.



- B. At completion of work, remove from the project site all surplus painting materials and all debris. Remove all spatters and leave this part of the work in a clean and finished condition.

END OF SECTION



## SECTION 10161

### TOILET PARTITIONS AND URINAL SCREENS

#### PART 1 – GENERAL

##### 1.01 SECTION INCLUDES

- A. Solid plastic partitions.

##### 1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood blocking and nailers required for the permanent and rigid installation of the toilet partitions and urinal screens.
- B. Section 09250 - Gypsum Wallboard: Wallboard partition systems installed prior to installation of toilet partitions and urinal screens.
- C. Section 09300 - Tile: Completion of tile installations prior to installation of toilet partitions and urinal screens.
- D. Section 09900 - Painting: Protection of toilet partitions and urinal screens during painting operations.
- E. Section 10800 - Toilet Room Accessories: Coordination of accessory installation with the fabrication and installation of the toilet partitions.

##### 1.03 REFERENCES

- A. ASTM International (ASTM)
  - 1. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
  - 2. ASTM D 1735 - Standard Practice for Testing Water Resistance of Coatings Using Water Fog Apparatus.
  - 3. ASTM D 2247 - Standard Practice for Testing Water Resistance of Coatings in 100 percent Relative Humidity.
- B. National Fire Protection Association: NFPA 286 - Standard Methods of Fire Test for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

##### 1.04 SUBMITTALS

- A. Submit under provisions of Section 01340.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Literature indicating typical panel, pilaster, door, hardware and fastening.
  - 2. Preparation instructions and recommendations.
  - 3. Storage and handling requirements and recommendations.
  - 4. Installation methods.
- C. Shop Drawings
  - 1. Dimensioned plans indicating layout of toilet compartments.
  - 2. Dimensioned elevations indicating heights of doors, pilasters, separation partitions, and other components; indicate locations and sizes of openings in compartment separation partitions for toilet and bath accessories to be installed in partitions; indicate floor and ceiling clearances.
  - 3. Details indicating anchoring components (bolt layouts) and methods for project conditions; indicate components required for installation, but not supplied by toilet compartment manufacturer.

- D. Selection Samples: For each finish product specified, one complete set of color selection guides representing manufacturer's full range of available colors, textures and patterns.
- E. Verification Samples: For each finish product specified, two samples representing actual product, color, texture and pattern.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards.
- B. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.
- C. Lay cartons flat, with adequate support to ensure flatness and to prevent damage to pre-finished surfaces.
- D. Do not store where ambient temperature exceeds 120 degrees F (49 degrees C).

#### 1.06 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at a minimum of 60 degrees F (15.6 degrees C).

#### 1.07 WARRANTY

- A. Manufacturers Standard Warranty: For Solid Plastic HDPE Material: Against breakage, corrosion, and delamination for 15 years.

#### 1.08 COORDINATION

- A. Coordinate Work with placement of support framing and anchors in walls and ceilings.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Acceptable Manufacturer: ASI Accurate Partitions; 160 Tower Drive, Burr Ridge, IL 60527; Tel: 708-442-6800; Email: [info@asi-accuratepartitions.com](mailto:info@asi-accuratepartitions.com); Web: <http://www.asi-accuratepartitions.com>.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600. No other manufacturer will be accepted without ASTM performance compliance.

#### 2.02 COMPARTMENTS AND SCREENS

- A. Toilet Compartments: Floor anchored/overhead braced solid plastic panels.
  1. Compartment Depth and Width: As indicated on Drawings.
  2. Height Above Floor: 14 inches (356 mm).
  3. Door/Panel Height: 55 inches (1397 mm).
  4. Pilaster Height: 82 inches (2083 mm).

## 2.03 SOLID PLASTIC TOILET COMPARTMENTS

- A. Doors, Panels, Screens, and Pilasters: Single sheet solid, homogenous HDPE plastic material formed from waterproof, non-absorbent, high-density polyethylene resins; mark-resistant self-lubricating surface; edges finished smooth.
  - 1. Material: Solid, homogenous HDPE; 1 inch (25 mm) thick.
  - 2. Edges: 1/4 inch (6 mm) radius machined edges.
  - 3. Heat Sink: Aluminum heat sink, to dissipate heat from incendiary devices used by vandals, attached to bottom of doors and panels.
- B. Finish
  - 1. Color: Solid color throughout; As selected from manufacturer's standard colors.
  - 2. Texture: Pebble; hammered not allowed.
- C. Pilaster Shoes: Type 304 Stainless Steel, No. 4 satin finish. Easy Stall shoe shall be of a one piece design and integral to the mounting system and formed from 304 stainless steel 3 inch (76 mm) high with a No. 4 satin finish. Pilaster shoes are anchored to the pilaster with No. 10 stainless steel, vandal-resistant screws.
- D. Headrail: Manufacturer's standard anodized aluminum rail with anti-grip profile.
- E. Pilaster Anchors, Floor Anchored/Overhead Braced
  - 1. Easy Stall shoe system. 1/4 by 2 inch (6 by 51 mm) steel screws attach Easy Stall shoe to floor.
  - 2. Pilaster to be inserted into shoe and secured after height adjusted. Leveling adjustment to be concealed by pilaster shoe.
  - 3. Height/leveling adjustment to be made via machine thread bolts inserted into factory installed threaded insert in bottom of pilaster.
- F. Hardware
  - 1. Hardware and Accessories, Heavy Duty: Manufacturer's standard operating hardware and accessories.
  - 2. Material: Stainless steel
  - 3. Hinges: Manufacturer's standard stainless steel continuous piano hinge, cam type that swings to a partially open position, allowing emergency access by lifting door.
  - 4. Latch and Keeper: Manufacturer's standard surface-mounted latch unit, designed for emergency access, and with combination rubber-faced door strike and keeper.
  - 5. No-Sight privacy strips at all compartments.
  - 6. Coat Hook: Manufacturer's standard combination hook and rubber-tipped bumper, sized to prevent inswinging door from hitting compartment-mounted accessories.
  - 7. Door Bumper: Manufacturer's standard rubber-tipped bumper at outswinging doors
  - 8. Door Pull: Manufacturer's standard unit at outswinging doors. Provide units on both sides of doors at compartments designated as accessible.
  - 9. Overhead Bracing: Manufacturer's standard continuous, extruded-aluminum head rail with antigrip profile and in manufacturer's standard finish.
  - 10. Anchorages and Fasteners: Manufacturer's standard exposed fasteners of stainless steel, finished to match the items they are securing, with theft-resistant-type heads. Provide sex-type bolts for through-bolt applications. For concealed anchors, use stainless steel.

## PART 3 EXECUTION

### 3.01 EXAMINATION AND PREPARATION

- A. Inspect and prepare substrates using the methods recommended by the manufacturer for achieving best result for the substrates under project conditions. Clean surfaces thoroughly prior to installation.

- B. Do not proceed with installation until substrates have been prepared using the methods recommended by the manufacturer and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
  - 1. Verify dimensions of areas to receive compartments.
  - 2. Verify locations of built-in framing, anchorage, bracing, and plumbing fixtures.

### 3.02 INSTALLATION

- A. Install in accordance with approved shop drawings and manufacturer's instructions.
- B. Fasten components to adjacent materials and to other components using purpose-designed fastening devices.
- C. Adjust pilaster anchors for substrate variations; conceal anchors with pilaster shoes.
- D. Equip each compartment door with hinges and door latch.
- E. Install door strike keeper on pilasters in alignment with door latch.
- F. Equip each compartment door with one coat hook and bumper.
- G. Installation Tolerances
  - 1. Maximum variations from plumb or level: 1/8 inch (3 mm).
  - 2. Clearance between wall surface and panels or pilasters: 1-1/2 inch (38 mm) maximum.

### 3.03 ADJUSTING

- A. Adjust and align hardware to uniform clearance at vertical edge of doors.
- B. Adjust adjacent components for consistency of line or plane.

### 3.04 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. Remove factory protective coverings and clean finish surfaces in accordance with manufacturer's instructions before substantial completion.

END OF SECTION

## SECTION 10201

### BUILDING LOUVERS

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes all labor, materials, and services required to fabricate and install the custom designed aluminum building and steeple louvers.

##### 1.02 RELATED SECTIONS

- A. Section 04210 - Brick Masonry: Coordination of louver installation in brick veneer.
- B. Section 05400 - Cold Formed Metal Framing: Metal framing for louver support.
- C. Section 06100 - Rough Carpentry: Treated wood blocking and nailers required for the rigid and permanent installation of the louvers.
- D. Section 07411 - Metal Roof and Wall Panels: Louvers installed in metal panel building systems.
- E. Section 07464 - Fiber-Cement Siding, Trim and Soffit: Coordination of the siding and trim installations with the installation of the building louvers.
- F. Section 07600 - Flashings and Sheet Metal: Installation of required flashings for weathertight louver installations.
- G. Section 07920 - Sealants and Caulking: Sealing of perimeter of louvers.
- H. Division 22 - Plumbing: Attachment of mechanical systems to building louvers.
- I. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Attachment of HVAC systems to building louvers.

##### 1.03 QUALITY ASSURANCE

- A. Manufacturer: The louver manufacturer shall be a member of the "Air Moving and Conditioning Association, Inc."
- B. Performance Requirements: Where louvers are indicated to comply with specific performance requirements, provide units whose performance ratings have been determined in compliance with Air Movements and Control Association (AMCA) Standard 500.
- C. Comply with SMACNA "Architectural Sheet Metal Material" recommendations for fabrications construction details and installation procedures, except as otherwise indicated.
- D. Comply with NAAMM "Metal Finishes Manual" for finish designations and applications recommendations.
- E. Field Measurements: Verify design requirements, size, location, and placement of louver units prior to fabrication, wherever possible.
- F. Shop Assembly: Coordinate field measurements and shop drawings with fabrication and shop assembly to minimize field adjustments, splicing, mechanical joints, and field assembly of units. Preassemble units in shop to greatest extent possible, and disassemble as necessary for shipping and handling limitations.

#### 1.04 SUBMITTALS

- A. Submit copies of shop drawings and technical data to the Architect in accordance with Section 01340. Include plans, elevations, and details of sections and connections to adjoining work. Sections shall show accurate wall construction matching wall types in Drawings. Indicate materials, finishes, fasteners, joinery, flashings, sealant joints, and other information to determine compliance with specified requirements.

#### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store louvers and accessories on the job site, above grade, in weathertight shelter, in manufacturer's original cartons until ready for installation.

#### 1.06 WARRANTY

- A. Finish Warranty: Provide manufacturer's standard 15-year warranty protecting the finish against chalking, fading, peeling, etc.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. Building Louvers: Louvers shall be Airolite Type SCH401, extruded aluminum alloy 6063-T52, as manufactured by the Airolite Company of Marietta, Ohio, or equal as approved by the Architect. The louvers shall be in shapes and dimensions as shown on the drawings. Blades shall be storm proof and drainable.
  - 1. Furnish louvers with aluminum frame, extended sill piece and holes in head, jamb and sill for fastening, as required by project conditions. Provide all necessary anchorage devices, bolts, etc., of aluminum or stainless steel.
  - 2. Mullion spacing shall be as required by the manufacturer, and shall be installed on the rear side of the louver, out of view.
  - 3. Furnish complete with replaceable 16x18 mesh aluminum insect screens with frames to match louvers. Splines shall be extruded vinyl and removable to permit rescreening from the interior side of the louver.
  - 4. Finish: All louvers, frames, etc. shall have a factory-applied 70% fluoropolymer coating in custom color as selected by the Architect.
  - 5. Provide free area and air flow as required for the mechanical systems. See the Mechanical drawings and specifications for free area and air flow.

### PART 3 - EXECUTION

#### 3.01 INSPECTION

- A. Check all openings which are to receive the louvers. Verify that dimensions are in agreement with the approved shop drawings. Verify that all openings are free from irregularities which would interfere with the louver installation. Do not install the louvers until all defects have been corrected.
- B. Coordinate setting drawings, diagrams, templates, instructions and directions for installation of anchorages which are to be embedded or set in surrounding substrate.
- C. Coordinate installation of louvers with the installation of the flashing and sheet metal work (Section 07600) and the wall assembly in which the louver is being installed.



### 3.02 INSTALLATION

- A. Locate and place louver units plumb, level, and in proper alignment with adjacent work.
- B. Use concealed anchorages wherever possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make weathertight connection.
- C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers, as indicated.
- D. Protect non-ferrous metal surfaces from corrosion by application of heavy coating of bituminous paint on surfaces which will be in contact with dissimilar materials.
- E. Provide concealed gaskets, flashings, joint fillers, and insulations integral to louver system, and install as work progresses to make installations weathertight.
- F. Provide suitable, compatible gasket where dissimilar metals are joined.

### 3.03 CLEANING AND PROTECTION

- A. **Cleaning:** Surfaces of all louvers and frames shall be cleaned on both inside and outside of all foreign matter, to present a neat, clean appearance. Where finish has become stained or discolored, it shall be cleaned and have finish restored in accordance with the louver manufacturer's recommendations. Stained, discolored, or abraded louvers and frames that cannot be satisfactorily repaired shall be replaced.
- B. **Protection:** Completed installation shall be protected from damage caused by work being performed in the surrounding area, and until the Date of Substantial Completion.

### 3.04 CLEANUP

- A. Upon completion of the installations, remove from the job site all unnecessary equipment, excess materials and debris and leave ready for the next sequence of work to be performed.

END OF SECTION



SECTION 10400  
IDENTIFYING DEVICES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and installation of:
  - 1. Interior room identification signage and directional signage.
  - 2. Handicap Parking signage.

1.02 RELATED SECTIONS

- A. Section 08100 - Hollow Metal Doors and Frames: Room identification signage installed on doors.
- B. Section 08210 - Wood Doors: Room identification signage installed on doors.
- C. Section 09250 - Gypsum Wallboard: Substrate for application of signage.
- D. Section 09900 - Painting: Completion of painting operations prior to installation signage.

1.03 QUALITY ASSURANCE

- A. Comply with ANSI handicapped requirements, ADA requirements, and the local and State Handicapped Codes and Ordinances for letter/signage sizes, engraving techniques, symbols, and locations of installations.
- B. Acceptable Manufacturers - The following manufacturers are acceptable for use on this project subject to compliance with requirements:
  - 1. Gemini, Inc.
  - 2. Dale & Dale, Inc.
  - 3. ARK Ramos

1.04 SUBMITTALS

- A. Copies of complete technical data and/or shop drawings describing the materials specified and installation shall be delivered to the Architect in accordance with Section 01340. Submit samples if requested by the Architect.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store materials in a locked, weathertight area. Remove from the locked area only those items to be immediately installed. Other items shall remain in locked storage until installation of same.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Identification Devices and Interior Room Signage, ADA Signage and Directional Signage: Provided for by the Allowances specified under Section 01020, Allowances.
- B. Handicapped Parking Signage: Comply with applicable ordinances for manufacture and installation of the parking signage. Sign shall have the International Symbol for Accessibility as well as the lettering "HANDICAPPED PARKING ONLY".

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Install signage, lettering, and identifying devices using anchorages and attachment devices and methods recommended by the manufacturer for the substrate(s) involve with such devices concealed where possible. Consult with Architect for locations and placement of signage. Exterior anchorage devices must be compatible with the substrate and be non-corrosive.
- B. Handicapped Parking Signage: Mount sign on galvanized steel post set in concrete filled posthole. Sign shall be plumb, level, and rigid. Refer to Drawings for signage locations.

### 3.02 CLEANUP AND CLEANING

- A. Upon completion of the signage installation, remove from the site all excess materials, equipment, and debris. Leave signage clean, and free from dirt, dust, and imperfections.

### 3.03 PROTECTION

- A. Completed installations shall be protected from damage until date of Substantial Completion. Damaged signage shall be replaced at no additional expense to the Owner.

END OF SECTION

SECTION 10511  
LOCKERS AND BENCHES

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes the following:
  - 1. Painted steel turnout lockers.
  - 2. Wood benches with steel posts.
- B. See section 01010 – Summary of Work for Owner Furnished Contractor Installed Lockers specified herein.

1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood nailers and blocking required for the installation of lockers.
- B. Section 09250 - Gypsum Wallboard: Completion of the gypsum wallboard installation prior to installation of the lockers.
- C. Section 09900 - Painting: Completion of painting operations prior to installing lockers.

1.03 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets, and installation instructions for each type of product indicated.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Dimensioned plans and elevations, with installation instructions. Indicate blocking, clearances, and anchoring required for the project conditions.
- D. Include product identification system.
- E. Samples: For each exposed finish.
- F. Maintenance data.

1.04 QUALITY ASSURANCE

- A. Conduct a Pre-installation Conference at the jobsite.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Do not deliver materials or begin installation until building is enclosed, with complete protection from outside weather, and building temperature maintained at a minimum of 60 degrees F (15.6 degrees C).

## 1.06 WARRANTY

- A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of products that fail in materials or workmanship, excluding finish, within specified warranty period.
- B. Failures include, but are not limited to, the following: Structural failures, finishes, hardware, faulty operation of latches and other door hardware.
- C. Damage from deliberate destruction and vandalism is excluded.
- D. Warranty Period: 1 year from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.01 LOCKERS

- A. Emergency Response Locker as manufactured by Republic Storage Systems, LLC. (republicstorage.com) or equal product by other manufacturer approved in advance.
  - 1. Standard Painted Steel Emergency Response Locker
  - 2. 24" wide x 18" deep x 72" high.
  - 3. Full Width Shelf at 12" from top
  - 4. Partition with a nominal 10" wide lockable compartment and additional shelf
  - 5. Heavy duty 1" diameter, chrome plated coat rod on garment side
  - 6. Double prong hook mounted underneath the lockable compartment
  - 7. 16 gauge Minimum material throughout. louvered or diamond perforated door
  - 8. Cremone style turn handle
  - 9. Double Doors
  - 10. Continues hinges
  - 11. Mounting and Anchoring hardware: Stainless Steel; provided by manufacturer.
  - 12. Color: selected by Architect from standard colors.
  - 13. Keying

### 2.02 BENCHES

- A. Locker Room Benches as manufactured by Republic Storage Systems, LLC. (republicstorage.com) or equal product by other manufacturer approved in advance.
- B. Wood bench seat, with clear finish.
- C. Steel pedestals with welded mounting plates. Color: match lockers.
- D. Height: 17-12"
- E. Lengths as shown in the drawings.

## PART 3 - EXECUTION

### 3.01 EXAMINATION AND PREPARATION

- A. Field measure all conditions prior to fabrication of products. Contractor is responsible to coordinate field conditions and products for proper size and fit per the design drawings.

- B. Inspect and prepare floors and walls, including blocking, to ensure best results for installation of lockers and benches.
- C. Do not proceed with installation until all conditions have been prepared as required by the manufacturer.

END OF SECTION





## SECTION 10520

### FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes furnishing materials and installation of the fire extinguishers, fire extinguisher cabinets and fire extinguisher mounting hardware.

##### 1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood blocking for rigid attachment of wall brackets and cabinets.
- B. Section 09250 - Gypsum Wallboard: Completion of gypsum wallboard installations prior to attachment of wall brackets. Coordination of the wallboard system installations with the cabinet installations.
- C. Section 09900 - Painting: Protection of installed cabinets during painting operations. Completion of painting operations prior to installation of wall mounted brackets.

##### 1.03 QUALITY ASSURANCE

- A. Provide fire extinguishers, cabinets, and accessories by one (1) manufacturer, unless otherwise acceptable to the Architect.
- B. UL-Listed Products: Provide new fire extinguishers which are UL Listed and bearing UL Listing Mark for type, rating and classification of extinguisher indicated.

##### 1.04 SUBMITTALS

- A. Submit copies of technical data to the Architect in accordance with Section 01340.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Fire Extinguishers
  - 1. Multi-purpose, 10 pound, dry chemical type rated for Class A, B and C fires, and shall have a U.L. 4A-60BC rating, except at Kitchen.
  - 2. 2-1/2 gallon, K-type at Kitchen
- B. Cabinets: As manufactured by J.L. Industries of Bloomington, Minnesota. Where cabinets are installed in fire-rated walls, provide cabinets with the FS option.
  - 1. Provide semi-recessed Panorama Model 1017G17, with factory applied white enamel finish, clear tempered glass with red FE lettering arranged vertically.
- C. Wall Brackets: Wall brackets and mounting hardware shall be furnished for wall hung extinguishers. Provide J.L. Industries MB 846 wall bracket for 10 pound extinguisher. Coordinate bracket type with extinguisher purchased.
  - 1. Decals: Red letter decals spelling "FIRE EXTINGUISHER" for application to vertical surface above unit; letter size, style, and location in accordance with NFPA requirements.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Wall Mounted (Bracket Supported) Fire Extinguishers
  - 1. Install fire extinguishers in locations shown on Drawings. Wall brackets shall be anchored solidly to wall. Block walls where required in order to obtain a rigid installation. Mount so that fire extinguisher handle is no higher than 4'-0" above finish floor; comply with requirements of ADA and NFPA 10.
  - 2. Install identification for bracket mounted extinguishers. Install decals above each extinguisher unit in accordance with NFPA 10 and ADA.
  - 3. Install bracket-mounted fire extinguishers in the following locations:
    - a. Kitchen.
    - b. Electrical and mechanical rooms.
- B. Cabinet Installation
  - 1. Install cabinets to permit floor to extinguisher handle to be 48". Comply with requirements of ADA and NFPA 10.
  - 2. Install cabinets in locations indicated on the Drawings.
  - 3. Cabinets shall be rigidly anchored to solid treated wood blocking or metal framing.
- C. Extinguisher Charging: Install charged extinguishers not more than 48 hours prior to Date of Substantial Completion.

END OF SECTION

## SECTION 10800

### TOILET ROOM ACCESSORIES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes materials and installation of toilet room accessories.

##### 1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood blocking for the rigid installation of grab bars and other accessories.
- B. Section 09250 - Gypsum Wallboard: Completion of gypsum wallboard installations prior to accessory installations.
- C. Section 09300 - Tile: Completion of the tile installations prior to accessory installations.
- D. Section 09900 - Painting: Installation of mirrors and utility shelves after painting operations are complete.
- E. Section 10161 - Toilet Partitions and Urinal Screens: Coordination of the fabrication and erection of the toilet partitions with the accessories provided.

##### 1.03 QUALITY ASSURANCE

- A. Acceptable Manufacturers for Toilet Room: The following manufacturers are acceptable for use on this project subject to compliance with these specifications:
  - 1. Bobrick Washroom Equipment, Inc.
  - 2. Bradley Corporation
  - 3. Franklin Brass
  - 4. American Specialties Inc.
- B. Design Requirements: Comply with ANSI A117.1 grab bar loading requirements.

##### 1.04 SUBMITTALS

- A. Submit copies of technical data and shop drawings for Architect's review, in accordance with Section 01340. Submit samples at the request of the Architect.

##### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Products shall be shipped and stored in manufacturer's original, unopened cartons. Store items in locked area prior to installation. Items not being installed shall remain under lock at all times.

#### PART 2 - PRODUCTS

##### 2.01 GENERAL

- A. All toilet room accessories shall be of matching design and all from a single manufacturer. All grab bars shall be concealed mounting type. All grab bars shall be provided with manufacturer's standard, galvanized steel concealed anchor plates.

- B. Materials: Use AISI Type 304 stainless steel, (non-austenitic), for all parts except mounting kits for grab bars or specific items noted otherwise.
- C. Fasteners: Toilet room accessory manufacturer's recommended fasteners for substrate encountered.

## 2.02 TOILET ROOM ACCESSORIES

- A. Provide the following accessories. Refer to Drawings for locations of installations.
  - 1. Recessed Paper Towel Dispenser: Recessed design, Bobrick #B-359. Provide one (1) at each Restroom.
  - 2. Double Roll Toilet Tissue Holders: Bobrick #B-7686. Provide One (1) at each toilet compartment.
  - 3. Soap Dispensers: Wall mounted, Bobrick #B-2111. Locate as Shown on Drawings: Provide Bobrick #B-822 lavatory mounted soap dispenser at main Restrooms. Mounting on mirrors is not allowed.
  - 4. Grab Bars at Handicapped Toilets: Length(S) as indicated, 1-1/2" diameter satin finish stainless steel, 1-1/2" from wall mounting, Bobrick #B-6806 Series. Provide with manufacturer's concealed anchor plates.
  - 5. Framed Mirrors: Sizes as detailed in drawings. Also refer to Section 00800.
  - 6. Waste Receptacle: Floor-standing, open top, Bobrick # B2260. Provide one (1) at each restroom.
  - 7. Mop and Broom Holder: Bobrick #B-223 by 36". Two (2) required; locate in each Janitor Closet.
  - 8. Robe Hook: Bobrick # B-2116. (Toilet compartments are provided with combination hook/bumper).

## PART 3 - GENERAL

### 3.01 INSTALLATION

- A. General
  - 1. Each accessory shall be fastened rigidly in place, in perfect plumb, level, and alignment. Where an accessory is mounted on or in surface having joint pattern, it shall be mounted symmetrically within pattern. Surfaces of fastening devices exposed after installations shall have same finish as attached accessory.
  - 2. Install treated wood blocking in walls in advance to receive accessories.
  - 3. Consult with Architect at Project site for exact locations of accessories where locations are not indicated on drawings, or where indicated or proposed locations will interfere with other construction, door swings, light switches, etc.
  - 4. Exposed surfaces of accessories shall be protected with strippable plastic or other approved means until installation is accepted.
- B. Accessory manufacturer's mounting details shall be coordinated with other trades as work progresses. Locations of all accessories shall be shown on drawings and/or scheduled herein.
- C. Accessories shall be installed with fasteners recommended by manufacturers in manners to produce totally rigid installations.
- D. Grab Bars: Shall be mounted with devices and fastenings as required by mounting conditions to develop capacity to resist a downward pull of 250 pounds minimum.

### 3.02 CLEANING AND PROTECTION

- A. Adjacent wall surfaces and materials shall be protected during installation of accessories. Any damaged adjacent materials or accessories shall be repaired or replaced at no cost to Owner. Protect installed accessories until date of Substantial Completion.

### 3.03 CLEANUP

- A. Upon completion of the accessory installation, remove from the job site all excess materials and debris.

END OF SECTION

SECTION 11 11 33

VEHICLE EXHAUST REMOVAL SYSTEM

PART 1 – GENERAL

1.01 EXTRACTION SYSTEM OVERVIEW

- A. The exhaust system shall be designed to vent 100 % of exhaust gases and particulate safely to the outside of the fire station. The exhaust system shall be designed and installed by factory-authorized personnel, who have been certified by the manufacturer of the exhaust system. System to be installed as a turnkey project with all labor, tailpipe modifications and duct material included in the scope of work. Electrical connections and Disconnect Switch shall be part of electrical contractor's project scope.
- B. The department shall be able to use the exhaust system for performing engine checks indoors.
- C. System must be designed for high temperature vehicle exhaust fire rescue applications. The system shall automatically activate, disconnect, shutdown, and reactivate upon return.
- D. Exceptions and variances from any of the specifications outlined in these bid specifications must be acknowledged and listed.
- E. Related Documents to the specifications- Drawings and general provisions of the Contract apply to this section.
- F. Acceptable Product Manufacturer and Installation to be provided by:  
  
MagneGrip  
11449 Deerfield Road  
Cincinnati, Ohio 45242

1.02 QUALITY STANDARD ASSURANCE AND EXPERIENCE

- A. All standards of quality are meet and adhered to: UL, NFPA, AMCA, IMC, ASME, UMC, NEC and all local and state building codes. Product is to be supplied by manufacturer with a current ISO-9001-2015 certificate in manufacturing, design, layout, and sales functions.
- B. Independent System testing information documenting the overall effectiveness of the proposed system in a fire hall must be available.
- C. Manufacturing Experience: Companies must have 5 or more years of manufacturing experience of automatic vehicle exhaust removal systems for the fire/ rescue market. In state references must be made available upon request.
- D. Submittals indicating rated capacities and product features must be included for the following:
  - 1. Fan power ratings with blower curves provided
  - 2. Motor ratings and electrical characteristics
  - 3. Hose Ratings and testing verifications
  - 4. Controller
  - 5. Rail and Track information as specified

- E. Shop Drawings: drawing showing detailed layout of the system including elevations, length of track assembly, duct layout with detail and fan location.

### 1.03 SYSTEM DESCRIPTION

- A. The exhaust system shall be a source capture system designed to handle exhaust fumes from diesel engines. The system shall allow movement of apparatus from bay to bay. A total of 7 capture points in 1 station shall be addressed within this bid. The following equipment must be provided for the station during construction phase:

System shall include a fan of sufficient size to accommodate seven vehicles. Vehicles shall be addressed using a suction rail or flex track type system.

### 1.04 AIR VOLUME AND FAN REQUIREMENTS

- A. The exhaust fan for the stations shall provide a minimum of 4200 CFM (600cfm per vehicle) at 6.0 inches static pressure loss.
- B. The fan shall be a backward incline fan made from continuous welded construction. Fan housings that are screwed together or riveted are not acceptable.
- C. Fans shall be tested and balanced prior to installation, be manufactured in an ISO Certified Facility in accordance to AMCA Certification Standards.
- D. A safety disconnect in the vicinity of the blower fan motor must be provided.
- E. Fan motor shall be a totally enclosed, fan cooled and comply with UL 705 and NEMA Standards.

### 1.05 INSTALLATION AND DUCT CONNECTIONS

- A. Complete exhaust system with all equipment and installation including the exhaust fan, control box, ductwork, track/rail, hose and nozzle connection must be completed. Electrical work is not included in this scope of work. Tailpipe modifications from the muffler out that are required to ensure proper system operation are to be included in the scope of the work.
- B. Wall penetration core drill preferred. If, roof penetration is necessary, it shall be properly sealed by roofing contractor.
- C. All duct material installed as part of this project shall conform to Class II SMACNA Standards. An appropriate rain cap shall be provided on the building exterior.
- D. All system components shall be labeled with manufacturer identification.
- E. Installation of Exhaust System shall be accomplished by a factory authorized installation team that specializes in the business of installing emergency response exhaust systems.

### 1.06 NOZZLE ATTACHMENT

- A. The exhaust capture system must provide complete, 100% exhaust removal at the source from vehicle start up to exit of the apparatus from the station. In no event shall the nozzle allow for the potential escaping of diesel exhaust into the bay area. A check valve is required to stop contaminant from escaping into the bay area. It is a requirement of this bid that the system be capable of capturing 100% of exhaust gas and particulate even in the event the fan does not activate. Any nozzle that does not seal completely seal 100% around the tailpipe will not be accepted.

- B. The exhaust system shall be attached to the vehicle within 3 feet of the door threshold.
- C. The system shall feature “pull-down” attachment of exhaust hose for each of connection. The connection shall be accomplished by the operator standing erect and with just one simple motion to connect system to the vehicle. Nozzle can be connected at any angle with no alignment pins required.
- D. Nozzle shall incorporate a stainless-steel inner ring to serves as a heat shield and isolate the magnets from the hot exhaust stream.
- E. A check valve shall be incorporated into the nozzle to contain exhaust fumes and prevent leakage of exhaust fumes back into the bay. The Check Valve shall allow for introduction of cool ambient air directly across the magnets to protect magnets and flex hoses from heat. Any system that does not seal around the tailpipe to contain gases and allow for cool ambient air introduction shall be eliminated.
- F. Nozzle incorporates three magnet packs that are allowed to pivot and toggle to aid in the attachment and smooth release of the nozzle from the tailpipe. Magnets are attached to a rust proof, cast aluminum plate, and allows for cool air introduction into the nozzle.
- G. All adapters and nozzles must be of similar size to allow vehicles to freely move from bay to bay. Nozzle adapter shall not exceed 7inch diameter to allow adequate ground to tailpipe clearance. Adapters must be made of rust proof or rust resistant materials. Contact plate shall be nickel coated and proper thickness to ensure and maintain magnetic holding power. Adapters shall be capable of being mounted flush to the truck body without any protrusion.
- H. Nozzle elbow must have inlet that is 6 inches or greater so, exhaust airflow is not impeded. Nozzle to flex hose elbow transition must also be 5 inches or larger to maximize airflow.
- I. Adapter and nozzle shall be manufactured of primarily of rust resistant material to ensure consistent, good connection.
- J. A rigid lower hose section with handle shall be provided to aid easy hose connection.

#### 1.07 NOZZLE RELEASE AND MATERIAL

- A. The release of the nozzle shall occur by a forward motion of an apparatus. The separation shall be accomplished by a simple mechanical release. Systems requiring support systems for nozzle separation such as pneumatics or electronics are discouraged.
- B. The disconnection of the hose shall have a balancer that helps lift the exhaust nozzle off the vehicle tailpipe and not be *speed dependent*. The nozzle must separate from the tailpipe at the same point each time regardless of the speed of the vehicle.
- C. Any auto-release system that is speed sensitive requiring the driver to modify the exit speed to control the nozzle release shall not be accepted. Any nozzle requiring trip switches and support systems such as compressed air or electrical support to operate, or release are discouraged.
- D. Release of nozzle from the tailpipe shall not cause tugging or stretching of the hose to occur. Stress from separation and transporting of the hose to the door shall be borne by an internal cable to prolong life of the hose.
- E. Nozzle elbows constructed of one piece, cast aluminum are required to eliminate the possibility of denting, rusting and breaking.

1.08 SLIDING ALUMINUM TRACK/EXPANDABLE HOSE TRACK

- A. The exhaust system shall use a lightweight aluminum track support system to convey the exhaust hose from the vehicle's parked position all the way to the door threshold. The aluminum track shall be of box lock design with two cross supports for rigidity. Systems that use steel unistrut or aluminum H track design are not acceptable.
- B. An expandable hose track system shall be offered in the station to eliminate hose loops. The expandable hose shall be 6-inch diameter and have a compression/expansion ratio of 6:1. The expandable hose shall be attached to the track using a set of trolleys secured to the hose at 12-inch intervals.
- C. Rail and track system must be supported using adjustable, telescopic support legs allowing for future adjustment and changes to the system.

1.09 SUCTION RAIL

- A. To best facilitate possible situations where vehicles are parked in tandem and exited in the same direction a suction rail system must be used to provide a neat, clean installation. The suction rail system shall be comprised of rail sections which shall have a length of six feet (6'). Aluminum Material shall be 6063-T-5 with a standard mill finish.
- B. The aluminum suction rail shall be constructed from a one-piece continuous extruded aluminum profile. Construction shall be 6" round in diameter, with guide rails on each side to accommodate the external trolley assembly, and molded slots on the top for leg and support bracing.
- C. The trolley assembly shall be of external guide rail design. Four Delron wheels, using oil less bearing design, shall insure long life and allow the trolley assembly to roll freely along the external guide rails. The chassis shall include a fitted cone assembly, designed to part the memory sealing lips. The cone assembly shall be equipped with a series of friction rollers. These rollers shall be designed to reduce the resistance between the memory lips and the cone assembly.
- D. A shock absorber assembly shall incorporate an adjustable hydraulic cylinder, capable of reducing the forward impact of the trolley assembly, without causing damage to either the suction rail or the trolley assembly.
- E. A rubber bumper shall be located on the trolley assembly and designed as a contact point. The hydraulic cylinder shall be equipped with a rubber bumper end stop. Both bumpers shall be designed to align upon impact, and at no time shall metal to metal or plastic to metal contact be allowed.

1.10 SYSTEM BALANCER

- A. The system balancer shall retract and keep the hose and nozzle from dangling on the floor for safety concerns.
- B. Hose shall be supported by the balancer using a lifting elbow with an internal cable to reduce stress and wear and tear to the hose.

1.11 EXTRACTION SYSTEM EXHAUST HOSE

- A. Exhaust system hose drops shall be the same cross sectional diameter as the vehicle tailpipe or greater. Also, exhaust system shall maintain CFM that matches the cfm of the vehicle engine exhaust when running at 1500 RPM.
- B. The flexible exhaust hose is manufactured for the sole purpose of venting high temperature exhaust gases which are produced by internal combustion engines.



- C. This construction of hose must be capable of operating at a continuous minimum temperature of 400°F and intermittent temperatures of 550°F. Hoses that are not rated at or higher than these temperatures will not be accepted.
- D. Five-inch diameter flex hoses are preferred to smaller hoses to provide less static pressure loss and more efficient fan performance.
- E. A two-foot, rigid, lower section hose shall be included with extreme heat tolerance. Hose shall be tested by independent certified laboratory to be capable to 1000 degrees F. Lower section hose additionally shall be flame retardant and be constructed using engineered materials to maintain shape and integrity.

#### 1.12 AUTO-START CONTROL SYSTEM

- A. Shall be designed to sense the output pressure normally generated by any internal combustion engine. When the nozzle is connected to the vehicle's exhaust tailpipe and the vehicle is started by the operator an automatic controller, the increased output pressure shall be detected by a pressure sensor and activate the exhaust fan. A low voltage timer will keep the exhaust fan operating for a period of time designated by fire department procedures. As an option, ignition start activation may be also offered for consideration.
- B. Electrical Controller must be UL listed/approved and manufactured in accordance with Underwriters Laboratories standard UL-508 enclosed industrial control panels and incorporate a limited energy control circuit. For safety, the enclosure must be NEMA4X rated fiberglass construction with a watertight seal.

#### 1.13 SYSTEM WARRANTY

- A. Complete exhaust system parts warranty shall be for a minimum of 1 year. A warranty certificate describing the warranty to be provided must be included. Location and name of nearest service outlet should be listed. Location of parts inventory shall be indicated as well. All equipment must be supplied by one system manufacturer with the complete system covered in its entirety by the manufacturer's warranty.

#### 1.14 POINT OF ORIGIN:

- A. Equipment shall be manufactured by an American Owned company, located and operated solely in the United States. Systems that are built using 100% American parts supplied from U.S. vendors are preferred. All components of the system shall be American Standard.

END OF SECTION



SECTION 11400  
FOOD SERVICE EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Includes all roughins and complete connections to put into operation all food service equipment and dishwash equipment

1.02 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Metal fabrications required for the complete and permanent installation of the kitchen hood system.
- B. Division 22 - Plumbing: Plumbing roughins and connections.
- C. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Heating, Ventilating and Air Conditioning roughins and connections.
- D. Division 26 - Electrical: Electrical roughins and connections.

1.03 QUALITY ASSURANCE

- A. The materials and installation of all food service equipment furnished under this Contract shall conform to the Standards of the "National Sanitation Foundation", the rules and regulations of the Local Health Authorities.
- B. All electrical equipment shall have U.L. labels. All gas fired equipment shall, have AGA approval.

1.04 SUBMITTALS

- A. Copies of technical and installation data shall be submitted to the Architect in accordance with Section 01340. Submittals shall describe fabrication, installation, and connection requirements of each piece of equipment.
- B. Submit approved (by local and State Fire Marshall's) shop drawings and cut sheets to each trade involved in the roughing-in and final connections to the equipment.

1.05 SCHEDULING

- A. Shipment of Food Service Equipment shall be scheduled so that it does not arrive at the job site before adequate storage facilities have been prepared. All items shall be examined for shipping damage at this time. Any damages shall be reported immediately to the Architect. The General Contractor shall be responsible for receiving, unloading, inspecting, and providing adequate storage for this equipment.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Refer to Drawings for equipment types and locations.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Verify that roughing-ins are properly installed, properly located and are of the correct size, capacity and/or rating. Do not install any equipment until all irregularities have been corrected.
- B. Refer to Drawings and cut sheets for locations of various pieces of equipment.
- C. The Contractor shall uncrate, assemble, erect, and set into place each piece of equipment. Respective Sub-Contractors (Plumbing, Ventilating and Electrical), shall properly connect each item of Food Service Equipment and put same into operation. Contractor shall verify that each piece of equipment has been properly installed and connected and is ready for operation.
- D. Contractor shall verify proper installation of each piece of equipment and to perform "startup" and "test" of each piece of equipment.

### 3.02 CLEANING

- A. All equipment shall be thoroughly steamed cleaned and polished, inside and outside, ready for Owner's use. Moving parts shall be lubricated as required, water faucets and strainers shall be cleaned and in good operating conditions; replace if necessary. Damaged or marred surfaces shall be refinished.

END OF SECTION

## SECTION 11451

### APPLIANCES

#### PART 1 - GENERAL

##### 1.01 SECTION INCLUDES

- A. Includes roughins and final connections for the Owner-provided appliances. Refer to Section 01010, Summary of Work, for requirements.

##### 1.02 RELATED SECTIONS

- A. Section 06415 - Cabinetry and Millwork: Coordination of the installation of the cabinet tops with the appliances. Coordination of cut-outs for appliances.
- B. Division 22 - Plumbing: Roughins and final connections.
- C. Division 23 - Heating, Ventilating and Air Conditioning (HVAC): Roughins and final connections.
- D. Division 26 - Electrical: Roughins and final connections.

##### 1.03 QUALITY ASSURANCE

- A. All electrical equipment shall have U.L. labels.

##### 1.04 SUBMITTALS

- A. Copies of technical and installation data shall be submitted to the Contractor by the Owner for coordination purposes. Submittals shall describe installation and connection requirements of each piece of equipment.

##### 1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Shipment of appliances shall be scheduled so that it does not arrive at the job site before adequate storage facilities have been prepared. All items shall arrive at the job site in manufacturer's original crates. All items shall be examined for shipping damage at this time in the presence of the Architect, Owner, and Contractor. Any damages shall be reported immediately, in writing, to the Architect. Be responsible for unloading, inspecting, and providing adequate storage for this equipment.

#### PART 2 - PRODUCTS

##### 2.01 APPLIANCES

- A. Appliances: As provided by Owner. Refer to Section 01020 - Allowances. Refer to Drawings for appliance locations. Contractor to provide support structure, exhaust duct, fan, and weatherproof termination cap for such items.
- B. Roughing and final connections shall be provided by the Contractor.

## PART 3 - EXECUTION

### 3.01 INSTALLATION

- A. Verify that roughin requirements have been completed and are in the correct location, of the correct capacity, voltage, etc., prior to installation and connection of any appliance item.
- B. Set into place each piece of equipment. Respective Sub-Contractors (Plumbing, Ventilating, and Electrical), shall properly connect each item of appliance and put same into operation. Vendor shall verify that each piece of equipment has been properly installed and connected and is ready for operation.
- C. Final installation and connection of the appliances shall meet all local health code requirements.
- D. The equipment vendor shall return to the job site after installation is complete to verify proper installation and to perform "startup" and "test" of each piece of equipment.

### 3.02 CLEANING

- A. All appliances shall be thoroughly cleaned and polished, inside and outside, made ready for Owner's use. Moving parts shall be lubricated as required; water faucets and strainers shall be cleaned and shall be in perfect operating conditions; replace if necessary.

### 3.03 PROTECTION

- A. Protect completed installations from damage until Date of Substantial Completion. Replace damaged items with new products. Damaged or marred surfaces shall be refinished to "like new" condition or replaced, as adjudged by the Architect. Surfaces that cannot be repaired or restored shall be replaced.

END OF SECTION

SECTION 12510  
WINDOW BLINDS

PART - 1 GENERAL

1.01 SECTION INCLUDES

- A. Includes materials and the installation of the horizontal louver window blinds, including any additional supports, blocking, and accessories required for the complete installation.

1.02 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry: Treated wood blocking required for support for blind installations.
- B. Section 06200 - Finish Carpentry: For trim associated with windows.
- C. Section 08640 - Aluminum Clad Windows and Doors: Comply with glazing manufacturer's recommendations for placement and adjustment of window blinds at glazed openings.

1.03 COORDINATION

- A. Complete painting operations prior to installing window blinds.

1.04 QUALITY ASSURANCE

- A. Installer shall have a minimum of five (5) years' experience installing window blinds of the type specified in this section.
- B. Acceptable Manufacturers
  - 1. Levolor.
  - 2. Hunter Douglas.
  - 3. LouverDrape.

1.05 SUBMITTALS

- A. Submittals shall be in accordance with Section 01340.
- B. Submit copies of technical data and shop drawings.
  - 1. Shop drawings shall show actual dimensions of openings scheduled to receive the blinds, based on field measurements. Include illustrations of special components not detailed on manufacturer's data sheets and any special detail requirements.
- C. Submit color chips of available finishes for the Architect's review and color selection.
- D. Submittal shall be reviewed and approved by both the Architect and the Owner.

## 1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Ship, receive, and store the blinds in manufacturer's unopened cartons with all labels intact. Store above ground in a locked and heated area.

## 1.07 LOCATIONS

- A. Blinds to be provided in exterior windows in Classrooms, Bride's Room, Offices, Fellowship Hall, and Stairwells.

## PART 2 - PRODUCTS

### 2.01 HORIZONTAL BLINDS

- A. Window blinds shall be Levolor 2 Inch Custom Faux Wood Blinds, or equal as accepted by the Architect. Provide with the following:
  1. 1/1-2" Twill tape (ladder).
  2. Wand tilter.
  3. Lift cords with cord lock.
  4. Headrail.
  5. Bottom rail.
  6. Installation brackets to suit installation requirements. Provide intermediate support brackets, evenly spaced, as recommended by the window blind manufacturer.

## PART 3 - EXECUTION

### 3.01 INSPECTION

- A. Check that surfaces to which work will be secured are sound and free of irregularities interfering with installation.
- B. Do not begin installation until unsatisfactory conditions have been corrected.

### 3.02 INSTALLATION

- A. Install blinds within the cased window openings in accordance with the manufacturer's printed installation procedures and approved shop drawings, and at Architect's direction.
- B. Ensure adequate clearance to permit unencumbered operation.
- C. Position units plumb and true. Securely anchor into place with brackets, clips, and fasteners furnished by the blind manufacturer.

### 3.03 ADJUSTMENT

- A. Adjust clearances and overlaps to insure free operation. Comply with window/glass manufacturers' requirements for providing air circulation over surface of glass between blind and window.
- B. Replace damaged items with new material prior to Date of Substantial Completion.
- C. Repair adjacent surfaces damaged during installation.



3.04 CLEANING

- A. Remove protective coverings and devices.
- B. Clean soiled components and leave work site free of debris and excess materials.

3.05 PROTECTION

- A. Protect complete installations until Date of Substantial Completion. Damaged items shall be replaced at no expense to the Owner.

END OF SECTION



SECTION 22 00 00

MECHANICAL - GENERAL

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The General Conditions and other pertinent documents issued by the Engineer are a part of these Specifications and shall be complied with in every respect. In addition, the accompanying Architectural, Structural, Mechanical, Electrical and other Drawings shall be complied with in every respect. It shall be the responsibility of the Mechanical and Electrical Contractors to avail themselves of a complete set of Drawings and Specifications and be familiar with all parts thereof. Failure to do so shall not relieve any responsibility in the fulfillment of the Contract in any respect.

1.02 INTENT

- A. The intent of the Mechanical and Electrical Drawings and Specifications is that the Contractor shall furnish all labor and materials, equipment and transportation necessary for the proper execution of the work. The work required as related to other trades is shown in its majority in the drawings, but thoroughly examine the Drawings and Specifications relating to other trades in order to include all necessary work. No additional compensation shall be considered for failure to properly interpret the responsibilities to other trades. The Contractor shall do all the work shown on the Drawings and described in the Specifications and all incidental work considered necessary to complete the project. The Engineer reserves the right to make any reasonable change in the locations indicated without additional compensation to the Contractor.

1.03 CONFLICT

- A. If there is a conflicting variance between the Drawings and Specifications, the provisions of the most stringent shall control. In case of conflict between the General Provisions of the Contract or any modifications thereof, the Mechanical and Electrical Specifications shall control. The Drawings and Specifications are complementary and any work required by one, but not by the other, shall be performed as though required by both.

1.04 SCOPE

- A. The work contemplated and included under this Section of the Specifications consists of the furnishing of all labor, materials and supervision necessary for the installation of complete mechanical and electrical systems, as specified herein or shown on the Drawings, together with all necessary auxiliaries and appurtenances for same.
- B. Furnish and install all systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the Drawings or mentioned in these Specifications.

1.05 RELATED SECTIONS

- A. Section 221113 - Plumbing
- B. Section 260800 - Heating, Ventilation and Air Conditioning
- C. Section 260000 - Electrical

#### 1.06 INSPECTION OF SITE

- A. The Contractor, before submitting his proposal, shall inspect the site of the proposed construction and become fully informed as to the facilities, difficulties and restrictions attending the execution of the work. No additional compensation will be granted for work or items omitted from his proposal due to his failure to inform himself of the conditions affecting the performance of the work included in the Contract, or necessary to carry on and satisfactorily complete the work included herein.
- B. Locations and elevations of the various utilities included within the scope of this work are offered separate from the Contract Documents as a general safety guide only without guarantee as to accuracy.

#### 1.07 CODES, STANDARDS AND REGULATIONS

- A. All workmanship and materials herein specified shall meet in every respect the codes, standards and regulations having jurisdiction of the work. In case of difference between the various standards and other regulations, the matter will be brought to the attention of the Engineer and either the most stringent shall govern or the regulation or standard selected by the Engineer shall govern.
- B. Should the Contractor perform any work that does not comply with the requirements of the applicable codes, standards and regulations, he shall bear all costs arising from the deficiencies.
- C. The following codes, standards and regulations in effect on the date of bid invitation shall be considered a part of this Specification:
  - 1. State Public Health Department Regulations
  - 2. State Plumbing Code and HVACR Code
  - 3. National Fire Protection Association
  - 4. American Society of Mechanical Engineers
  - 5. American Society for Testing Materials
  - 6. Air Conditioning and Refrigeration Institute
  - 7. National Electrical Code
  - 8. National Electrical Safety Code
  - 9. Local, City, State and Federal Codes and Standards
  - 10. Underwriters' Laboratories
  - 11. Local Utilities Requirements
  - 12. National Electrical Manufacturers Association
  - 13. OSHA - Occupational Safety and Health Standards

#### 1.08 PERMITS AND FEES

- A. Provide all necessary notices, obtain all permits, pay all taxes, file all necessary plans and obtain all necessary approvals in connection with the mechanical and electrical work required for the project.

#### 1.09 CONTRACTOR DEFINITION

- A. Where the word "Contractor" is used in connection with the work included under the Mechanical and Electrical Sections of these Specifications, reference is thereby made to the Contractor who is engaged to execute the work included under that Section of the Specifications only, notwithstanding the fact that this Contractor may be either the prime contractor, general contractor or his subcontractor.

## 1.10 DRAWINGS

- A. The accompanying Mechanical and Electrical Drawings in general indicate approximately the locations of equipment and devices, except in those cases where specified notes appear. Exact locations of outlets and apparatus shall be determined by reference to the general plans and to detailed shop drawings, by measurements at the building and in cooperation with other contractors and the Engineer.
- B. Exact locations are subject to approval by the Engineer and may differ a reasonable amount from the approximate locations shown on the Drawings without additional compensation to the Contractor.
- C. Major changes resulting in a savings in labor or material shall be made only in accordance with a Change Order. Major deviations shall be made only where necessary to avoid interference and only after drawings showing the proposed deviations have been submitted to and approved by the Engineer.

## PART 2 - PRODUCTS

### 2.01 MATERIALS

- A. Provide materials and equipment which are new and in perfect condition. Where the Underwriters' Laboratories have established standards and issued labels for a particular group, class or type of equipment, the Underwriters' label shall be required on all equipment in that category. Each component shall have a nameplate giving the name and address of the manufacturer, catalog number and designation.
- B. Where the words "or equal" are used in the Specifications or on the Drawings, it shall be understood that the Engineer will be the sole judge in the matter. In all cases where more than one manufacturer or material is specified, the Contractor shall be permitted to furnish any of those specified, however, power equipment, panels, transformers and safety switches should be of the same manufacturer. It is not the intention to discriminate against any "equal" product of other manufacturers, but rather to definitely set a standard of quality and shall not be construed to limiting competition. Any proposed substitution will be assumed to be acceptable without specific authorization from the Engineer. Should a substitution be accepted and should the substitution prove defective or otherwise unsatisfactory for the intended service within the warranty period, the Contractor shall replace the substitution with the equipment or material originally specified, and on which the Specification required him to base his proposal, at no additional compensation.

### 2.02 TEMPORARY CONSTRUCTION POWER

- A. Furnish and install temporary power, water, heating, gas and lighting as the needs require for construction and safety purposes. It shall be the responsibility of the General or Prime Contractor to obtain and be responsible for all utility charges.

## PART 3 - EXECUTION

### 3.01 WORKMANSHIP - GENERAL

- A. All work shall be installed in a neat, careful, safe and workmanlike manner by craftsmen skilled in the trade.

### 3.02 STANDARDS

- A. Perform all work in such a manner that the many components will function as a complete workable system, including any accessories required to accomplish such installations. Perform all work in accordance with acceptable industry standards except where other standards or procedures are herein specified.

### 3.03 COORDINATION AND COOPERATION

- A. Coordinate all mechanical and electrical work with general, structural and other grades to insure proper execution of the work and general progress for the entire project and to avoid delaying any other Contractor. Cooperate with all other trades so that the entire project will not be handicapped, hindered or delayed. Assist other trades in working out space conditions to permit all work to be installed satisfactorily. No extra compensation will be allowed the Contractor for any remedial work required to eliminate interferences due to lack of coordination and cooperation.

### 3.04 STORAGE OF MATERIALS

- A. Protect all mechanical and electrical materials and apparatus to prevent any damage to them. Unless approved, no material or apparatus shall be stored outside or exposed to the elements. Cover apparatus with tarpaulins or other protective coverings, provide pallets or other methods to raise materials above the floor, and where directed, provide barriers or guard rails to protect the materials. Failure on the part of the Contractor to comply with the above to the complete satisfaction of the Engineer or his representative will be sufficient cause for rejection of the piece of apparatus in question.

### 3.05 DAMAGED AND DEFECTIVE WORK

- A. Remove and replace damaged and defective work or materials as directed by the Engineer with no extra compensation. All repairs to the work shall be made with new materials or a complete new piece of equipment shall be provided as directed by the Engineer.

### 3.06 ACCESSIBILITY

- A. Install all equipment and devices in an accessible location or in a location where they can be made accessible with removable panels. Provide Milcor or approved equal access panels as required for access to concealed equipment which requires servicing and testing. Equipment and devices shall be "readily accessible" where required by the National Electrical Code. In non-removable ceilings, the removal of a lighting fixture or air device is not an approved access panel.

### 3.07 SAFETY

- A. Provide necessary precautions for the safety of life or property. All construction work shall conform to the standards of the Occupational Safety and Health Act. Provide approved ground fault interrupter devices on all electrical construction devices consuming power and including temporary lighting systems.

### 3.08 CLEAN-UP

- A. The Contractor shall keep his work area clean at all times. Upon completion of work in any area, remove all equipment, excess materials and debris from the area and leave area broom clean. Protect all equipment during operations of painting, plastering, cutting or drilling and any like operation which might damage the equipment. Upon completion of the project, remove all equipment, excess material, scrap and debris from the job site. The job site shall be left clean and finished.

### 3.09 CONTRACTOR FURNISHED DATA

- A. Submit to the Engineer shop drawings for all equipment and materials to be installed on the project. No equipment or materials shall be installed until the shop drawings have been approved, even if the material submitted is identical to that originally specified. Consideration for substitution of materials will not be allowed if shop drawings are not received within 30 days after award of Construction Contract.
- B. Rough-in materials including pipe, wire, conduits, connectors and boxes may be submitted in a list form including the names of manufacturers and catalog type or number. All other equipment and materials shall be submitted with detailed prints or drawings. Prints or drawings shall be permanent reproductions and not Thermofax copies. The total number of shop drawings and lists shall be not less than six.
- C. Should the Contractor propose to submit items other than those specified, he shall include cuts of both the specified item and the proposed "equal item" in the brochures. The "originally specified product" and the "proposed substitution" shall be clearly marked.
- D. Where the Specifications or Drawings call for the work to be installed in accordance with the manufacturer's specifications, recommendations or directions, copies of the same shall be submitted to the Engineer for review and surveillance.
- E. Provide the Engineer four (4) copies of hard bound manuals for the project ten (10) days prior to final acceptance of the completion of the project. The manuals shall include copies of all corrected and approved shop drawings, schedules, catalog data, illustrations, performance curves and rating data, wiring and control diagrams, manufacturer's recommendations, operating and maintenance instructions, including safe operating procedures and requirements, spare parts lists and other pertinent information for the specified equipment and systems. The manual shall include a typewritten schedule of each motor, giving nameplate data, switch and fuse or breaker sizes and voltage and phase at motor terminals.

### 3.10 TESTS

- A. Test and demonstrate each and every system in the presence of and to the complete satisfaction of a representative of the Engineer. Prior to demonstration, start all equipment and make necessary tests and adjustments to place the system in first class operating conditions.
- B. Furnish all services, instruments, equipment and personnel required for the tests; in addition, submit a typewritten test report, where applicable and recorded data is taken or required for approval prior to final acceptance.
- C. Test all electrical conductors after installation but prior to termination with a 500 volt meggar. Conductors shall test free of grounds and shorts, and their insulation resistance shall be recorded for all feeders and circuits where the conductor size is size 8 and larger.

- D. No piping work, fixtures or equipment shall be concealed or covered until they have been inspected and approved. Engineer's representative shall be notified one week prior to when the work is ready for inspection. All work shall be completely installed, tested as required by the Section and the State Ordinances and State Safety Orders, and shall be leak-tight before inspection if requested. All tests shall be repeated upon request to the complete satisfaction of those making the inspection.
- E. All domestic water piping shall be flushed out, tested and shall be left under pressure of supply main or a minimum of 40 psi for the balance of the construction period.

### 3.11 AS-BUILT DRAWINGS

- A. Before the project will be finally accepted, a set of permanent as-built drawings must be submitted to the Engineer. The Contractor must certify accuracy by endorsement. The as-built drawings must be correct in every detail so that the Owner can properly operate, maintain and repair exposed and concealed work.
- B. All underground work shall be dimensioned. All change orders, field changes, equipment, circuit numbers, motors, feeders, breakers and starters shall be clearly indicated on the drawings. As-built drawings shall be submitted on tracings or other reproducible forms.

### 3.12 GUARANTEE

- A. Furnish to the Engineer a typewritten guarantee, countersigned by the General Contractor, to the effect that all work or equipment installed by him under this Contract shall be free from any or all mechanical and electrical defects for a period of one (1) year from the date of final acceptance. Should any mechanical or electrical defect develop in any of the systems or equipment within the period, due to faulty equipment, poor installation or workmanship, this Contractor shall agree to repair or replace same with new and like material without additional compensation. Lamps in all fixtures shall be guaranteed for 100 percent of manufacturer's published life data.

### 3.13 GENERAL CONSTRUCTION WORK FOR MECHANICAL AND ELECTRICAL FACILITIES - SLEEVES

- A. Provide 22 gauge galvanized sheet iron sleeves where pipes and conduits pass through interior masonry walls. Sleeves shall be trimmed flush with each finished surface. Sleeves shall be sufficient size to allow insertion of pipe or conduit passing through concrete beams and walls, masonry exterior walls and all floors. Sleeves shall be sized at least 1/2 inch greater than the outside diameters of the pipes or conduits. Floor sleeves shall extend 1 inch above floors. After conduits/pipes are installed, seal the space between the conduits/pipes and sleeves with a filler to provide a non-runable watertight joint.

### 3.14 ROOF FLASHING

- A. Provide complete watertight flashing and counter-flashing for all roof penetrations. All flashings shall be made to the complete satisfaction of the Engineer.

### 3.15 PAINTING

- A. All exposed mechanical and electrical equipment in finished areas shall be painted.



- B. Provide a prime coat to all unfinished equipment or material and all ferrous metal subject to rusting and corrosion during construction.
- C. All duct work visible through registers, grilles and diffuser openings shall be given two coats of dull black paint.

### 3.16 FASTENING DEVICES AND METHODS

- A. Provide fastening devices which are permanent, non-corroding, high strength type using threads or tightening. Minimum size bolt shall be 3/16 inch, and medium size screw shall be No. 10. Cement or glue type fasteners shall not be used. Driven studs may be used for fastening only in steel.
- B. In concrete and solid masonry, use threaded inserts secured in drilled holes or cast into the concrete. Conduits 1 inch and larger, junction boxes 12 inches and larger, and all equipment subject to motion, operation or vibration shall be fastened with lead tamped or wedge type expanding shield secured threaded inserts.
- C. In hollow masonry, plaster or plaster board, toggle bolts or expanding lag anchors shall be used with excess hole area covered with washers. Whenever possible, fastening in plaster or plaster board shall be into studs or structural supports.
- D. In wood construction, wood screws and lag bolts may be used. Screws shall not be hammered into wood.
- E. In steel construction, driven threaded studs, welded threaded studs, drilled threaded or through holes, or threaded clamps shall be used.
- F. In light weight applications on sheet metal, self-threading screws or bolts may be used.

### 3.17 PIPING

- A. Cut pipe accurately to measurements established at the site, work into place, without springing or facing and clear all windows, doors and other openings. Ream all piping to remove burrs and install so as to permit free expansion and contraction without causing damage. Make all changes in direction with fittings.
- B. Provide, whether shown or not, sufficient awing joints, expansion loops and devices necessary for a flexible piping system. Provide union shut off valves suitable located to facilitate maintenance and removal of all equipment or apparatus. Install drain valves at all low points of each system to enable complete drainage, and air vents at all high points in the piping system to enable complete air venting.
- C. Pipe all drains from condensate pans, and relief valves, to spill over an open sight drain, floor drain or other acceptable discharge points, and terminate with a plain end (unthreaded pipe) 6 inches above the drain. Rigidly support all drains.
- D. Weld-O-Let type fittings may be used for branch take offs where size of take off does not exceed 3 inch IPS and the take off is at least two standard pipe sizes smaller than the main size. Standard welding steel shall be used in all other locations. Copper piping shall have soldered joints with 95-5 solder. Galvanized piping shall have screwed joints.

- E. Joints in copper tubing shall be made using sweat fittings and tin-antimony solder and non-corrosive flux. For soldered joints, the outside surface at end of pipe and inside surface of fitting shall be thoroughly cleaned with steel wool or emery cloth and all burrs shall be removed. After cleaning, surfaces to be joined shall be evenly and completely covered with flux. Solder joints shall be well supported during the heating process and shall not be strained during the cooling period. Excess solder shall be removed while in a plastic state, leaving a fillet around the cup of the fitting as it cools.
- F. All pipe and fittings with screwed ends shall have its threads cut clean and true and in conformance with the ASA Specification B2-1 for taper threads. Screwed pipe and fitting of brass shall be made up without marring or damaging pipe and fitting surfaces. All screwed pipe joints, except where specified otherwise, shall be made up with non-soluble, non-toxic, approved thread compound, applied to male threads only.
- G. Connections between pipe fittings, hangers and equipment of dissimilar metals shall be avoided wherever practical. Wherever such connections are unavoidable, they shall be insulated against direct contact, using a high grade dielectric insulating material of Teflon, Milarta, asbestos fiber, neoprene, or equal.
- H. Hangers: Furnish and install suitable hangers and supports for all horizontal lines. Hangers and supports shall be Grinnel, Fee and Mason, or equal. Heavy pipes shall be carried by pipe hangers supported by rods secured to slab or by approved design. No piping shall be hung from other piping. In no case shall hangers be supported by means of vertical expansion bolts.
- I. Horizontal steel piping shall be supported in accordance with the following schedule:

<u>PIPE SIZE</u>	<u>MAX. HANGER SPACING</u>	<u>ROD SIZE</u>
1" & smaller	6 ft. 0 inches	3/8 inch
1 1/2" to 2"	9 ft. 0 inches	3/8 inch
2 1/2" to 4"	10 ft. 0 inches	1/2 inch
Larger than 4"	12 ft. 0 inches	1/2 inch

- J. All lines of copper tubing shall be supported by approved type hangers. Hangers for uncovered lines shall be especially designed for copper tubing. Hangers for covered tubing shall have broad scraps fitting outside of covering with insulation protection. Horizontal copper tubing shall be installed in accordance with the following schedule.

<u>PIPE SIZE</u>	<u>HANGER HORIZONTAL SPACING</u>	<u>ROD SIZE</u>
1/2"	6'	3/8 inch
3/4" & 1"	8'	3/8 inch
1 1/4" & Larger	10'	3/8 inch

### 3.18 ESCUTCHEONS

- A. Escutcheons shall be installed on pipes and conduits wherever they pass through floors, ceilings, walls or partitions in finished areas.
- B. Escutcheons shall be chrome plated brass.

### 3.19 RELOCATION OF GAS LINE

- A. Trenches for gas line shall be excavated to the required depth.
- B. The bottom of the trenches shall be tamped hard and graded to secure all available fill. Bell holes shall be excavated to ensure pipe resting for its entire length on solid ground. If rock is encountered, it shall be excavated to a depth of 6 inches below the bottom of the pipe, and before laying the pipe, the space between the bottom of the pipe and the rock surface shall be filled with gravel and shall be well tamped. No extra compensation will be made for rock excavation.
- C. After the gas line has been tested, inspected and approved by the Engineer and utility company representative, the trenches shall be backfilled with approved fill material, in 12 inch layers, firmly compacted, flooded if necessary, and thoroughly tamped.

### 3.20 NAMEPLATES AND IDENTIFICATION

- A. Provide nameplates and identification on all major mechanical and electrical equipment.
- B. Exposed or surface mounted panel boards, cabinets, starters, contactors, time clocks, fans, motors, air handling units, shall be coded and painted with one inch high stenciled black letters across the front.
- C. The above equipment where flush mounted, shall be coded on the inside of the cover.
- D. Stencils shall be made from heavy waxed cardboard with all letters in capitals and of the same size. At the completion of the project, the stencils shall be turned over to the Owner.
- E. In lieu of stencils, engraved bakelite nameplates may be used; nameplates shall be minimum one inch high with 1/4 inch high capital letters permanently fastened to equipment.

### 3.21 PIPE VIBRATION AND NOISE ISOLATION

- A. Insert 1 inch strip of hair felt to isolate all piping, conveying fluids, from direct contact with building walls, framing and sleeves. Pipe isolation shall be installed at all ring hangers consisting of 1 inch felt. Separate cold and hot water piping by 6 inches.
- B. All rotating equipment, piping, hangers, supports and tank connections to rotating equipment shall be vibration isolated from beams, columns, floors, ceilings, joists and walls using isolation equipment as specified in other sections of this specification or as shown on the Drawings.

### 3.22 CONTROL WIRING

- A. The Electrical Contractor shall furnish and install all control and interlock wiring for electrical equipment furnished. All wiring shall be in conduit and shall be in conformance with Section 16. Where control voltage is greater than 48 volts, wire shall be minimum 14 gauge AWG and shall have 600 volt insulation. Motors, starters, heaters, thermostats, and other control devices shall be furnished and delivered from the Mechanical Contractor to the Electrical Contractor for installation by the Electrical Contractor. The Mechanical Contractor shall furnish complete wiring diagrams to the Electrical Contractor for each and every piece of equipment to be installed and inter-connected if necessary. The Mechanical Contractor shall notify the Electrical Contractor concerning any changes in the electrical requirements due to substitution of equipment or variations in the equipment. Control raceways and boxes exposed to the elements shall be NEMA 3R or weatherproof.

END OF SECTION



SECTION 22 11 13

PLUMBING

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. Furnish all labor, materials, equipment and services to complete the plumbing work as shown on the drawings or as specified. Refer to the General Conditions, Supplemental General Conditions, Mechanical, Electrical, and other sections as they apply.

1.02 RELATED SECTIONS

- A. Section 22 00 00 – Mechanical - General

1.03 SCOPE

- A. Furnish and install all plumbing systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each item or accessory is shown on the drawings or mentioned in these specifications.
- B. The work shall consist of, but is not limited to the following general items.
  - 1. Plumbing fixtures and related drainage and water supply systems.
  - 2. Hot water heater system.
  - 3. Floor drains, cleanouts and hose bibbs.
  - 4. Gas piping system.

1.04 SUBMITTALS

- A. Submit shop drawings for:
  - 1. Fixtures.
  - 2. Water heaters.
  - 3. Drains, cleanouts, and hose bibbs.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Fixtures: As scheduled on Drawings and as manufactured by American Standard, Kohler, Crane, Bradley, or equal.
- B. Trim as for fixtures, plus Delta Faucet, or equal.
- C. Seats: Olsonite or Church.
- D. Hot water heater system: Refer to Plumbing Fixture Schedule on Drawings for manufacturer and model number.

- E. Hose bibbs: Josam, Chicago Faucet, Speakman, Zurn, or equal, with vacuum breaker. Material rough brass outside, chrome plated brass inside.
- F. Floor drains and cleanouts: Josam, Zurn or Wade.

## 2.02 PIPE AND FITTINGS

- A. Hot and cold water piping above slab shall be Schedule 40 galvanized steel with galvanized M.I. fittings or Type "L" copper with wrought copper fittings, or equal. Piping below slab shall be Type "K" copper tubing. Exterior piping shall be Schedule 40 galvanized steel, Type "K" or "L" copper, or Class 150 cast iron.
- B. Soil and storm drainage piping shall be Schedule 40 PVC, or Schedule 40 ABS DWV plastic pipe, or service weight cast iron with service weight fittings or no hub. Pipe and fittings to be coated with hot coal tar pitch inside and out.
- C. Vent piping 2 1/2 inch and under may be Schedule 40 galvanized steel pipe with banded cast iron fittings or galvanized victaulic couplings and fittings. Three inch and larger pipe shall be service weight cast iron, no hub. Copper DWV with copper drainage fittings may be used for all size vent piping. Vent pipe may be Schedule 40 PVC or ABS DWV plastic pipe.
- D. Gas piping shall be Schedule 40 black steel assembled with M.I. or welded fittings. Piping below grade coated and wrapped. Straight lengths furnished with factory coating. Fittings and damaged coatings shall be wrapped with tape-coat applied according to manufacturer's instructions.

## 2.03 VALVES AND STRAINERS

- A. Gate and globe valves shall be bronze with a steam working pressure of 125 psi as manufactured by Jenkins, Stockham or Wellworth, or equal.
- B. Valves 2" and smaller shall have screwed ends. Valves 2 1/2" and larger shall be iron body bronze mounted 125 psi ASA flanged.
- C. Strainer shall be "Y" pattern Sarco, or equal, and furnished with stainless steel baskets.
- D. Ball valves shall be full flow round port with teflon seats and seals.
- E. Pet cocks shall be brass and rated 125 lb. W.P.
- F. Check valves shall be all brass, swing check, screwed ends and suitable for 150 lb. W.P.
- G. Gas cocks 1" and below - Crane No. 272 low pressure, 1 1/4" and above and all medium pressure, Rockwell No. 114 or 116.
- H. Under water service valves shall be Mueller H-15200 curb stop with cast iron curb box with lid, plug and footpiece for sizes 1 1/2" and smaller, and Mueller A-2380-5, 200 psi, AWWA, iron body, non-rising stem gate valve with H-10360 cast iron valve box for sizes 2" and larger. Four 12" x 12" x 6" thick concrete pads around each box. Furnish key for each valve size.

## 2.04 BACKFLOW PREVENTERS

- A. Connections not permitted between potable water and a non-potable water or waste sources.
- B. Air gaps or approved backflow preventers shall always be used when required by code or as necessary to prevent backflow.
- C. Backflow preventers shall be installed with any supply fixture when the outlet end may at times be submerged, such as hoses, sprays, direct flushing valves, aspirators and under-rim connections to a fixture in which the surface of water in the fixture is exposed at all times to atmospheric pressure.

## PART 3 - EXECUTION

### 3.01 INSULATION

- A. All cold and hot water supply and return piping except exposed connections to plumbing fixtures, flanges and unions shall be insulated with 3/4" wall thickness Gustin-Bacon "snap-on," Owens-Corning "PF," or standard thick 85% magnesia.
- B. All exposed piping shall have a fire retardant jacket applied.
- C. Fittings and valves shall be insulated with insulating cement. In exposed areas a fire retardant jacket shall be applied.
- D. Cold water piping shall have a vapor barrier jacket applied.
- E. Hot water piping under floors, 1" foamglas covered with glass cloth and mastic.
- F. Pipe insulation shall have a protective shield of 14 gauge galvanized steel placed centrally between the insert section at all hangers. Shield shall cover one-half of the insulation.

### 3.02 ROOF FLASHING

- A. A waterproof flashing shall be provided for each pipe or vent passing through the roof.
- B. Flashing shall be one piece 26 gauge FHA flashing assembly with the joint between flashing and pipe sealed with waterproof compound.
- C. Approved equal 3 pound lead, copper or Semco assembly may be used in lieu of FHA flashing.

### 3.03 STERILIZING WATER SUPPLY PIPES

- A. After the hot and cold water systems are complete, they shall be flushed out completely and filled with water and a solution of sodium hypochlorite added to the system. The solution shall consist of 1 gallon of 5% sodium hypochlorite, Purex or other bleach to 200 gallons of water. Check residual chlorine by orthotolidin test. Allow solution to remain in the system for 24 hours, after which the entire system shall be flushed.
- B. The Engineer shall be notified 24 hours prior to testing so his representative can witness test.

3.04 WATER HAMMER ARRESTERS

- A. Water hammer arresters shall be provided on all supply piping, both hot and cold, where indicated on the Drawings.

3.05 LAYING SUPPLY LINES

- A. Exterior water supply lines shall be laid with a minimum cover of 36". Installation shall be in accordance with Arkansas Department of Health Regulations and local codes and ordinances.

3.06 T & P VALVE

- A. The T & P valve on the water heater shall be run to outside of building.

END OF SECTION



SECTION 23 08 00

HEATING, VENTILATION & AIR CONDITIONING

PART 1 - GENERAL

1.01 CONDITIONS

- A. Furnish all labor, materials, equipment and services to complete the work as shown on the Drawings or as specified. Refer to the General Conditions, Supplemental General Conditions, Electrical, and other Sections as they apply.

1.02 RELATED SECTIONS

- A. Section 22 00 00 – Mechanical - General

1.03 SCOPE

- A. Furnish all HVAC systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the Drawings or mentioned in these Specifications.
- B. The work shall consist of but is not limited to the following items:
  - 1. Exhaust fans
  - 2. Sheet metal duct work
  - 3. Diffusers and grilles
  - 4. Upflow gas furnace
  - 5. Vent hoods
  - 6. Condensing unit

1.04 SUBMITTALS

- A. Submit shop drawings for:
  - 1. Exhaust fans
  - 2. Diffusers and grilles
  - 3. Upflow gas furnace
  - 4. Vent hoods
  - 5. Condensing unit

PART 2 - PRODUCTS

2.01 UPFLOW GAS FIRED FURNACE

- A. Furnish an upflow gas fired warm air furnace. Heating capacity shall not be less than indicated on the plans and shall be capable of use with a coil for a split-system air conditioner system.
- B. Blower and Blower Motor. Blower shall be centrifugal type, statically and dynamically balanced. Motor shall have factory-lubricated bearings.

- C. Casing shall be of 22 gauge steel with baked enamel finish.
- D. Heat exchanger shall be Stratosteel and sectional in design.
- E. Burners shall be of aluminum-steel alloy and tapered for even gas distribution. Ignition shall be accomplished by means of a constantly burning pilot light.
- F. Controls shall include gas valve, which regulates gas flow, filters pilot gas, provides 100% pilot safety shut-off; pre-wired indoor fan relay with transformer; printed circuit control center on heating furnaces; low-voltage heating thermostat.

## 2.02 EXHAUST FANS

- A. Exhaust fans shall bear AMCA or PFMA certified seal and be of minimum sizes and capacities as shown on the drawings. Include disconnects, integral mounted. Furnish with variable pitch drives unless otherwise directed. Fans shall be spun type with automatic backdraft dampers.
- B. Furnish with factory curbs.
- C. Approved equals shall include Greenhack, Penn, Cook or Exit-Air.

## 2.03 SPLIT SYSTEM COIL AND CONDENSING UNIT

- A. Split system coil and condensing unit shall be equal to units shown in the Mechanical Equipment Schedule.

## 2.04 PRE-FABRICATED ROOF CURBS

- A. All roof top equipment shall be furnished with pre-fabricated roof curbs.

## PART 3 - EXECUTION

### 3.01 DUCTWORK

- A. Ductwork shall be galvanized fabricated and installed in accordance with the latest publication of SMACNA standards, for low pressure ductwork.
- B. Duct sizes shown on the drawings are actual sizes required and do not include allowance for internal insulation. Rectangular duct for units must be increased in size from that shown on the drawings to allow for insulation.
- C. Air foil turning vanes shall be installed in all abrupt elbows. Connection to diffusers, grille and register faces shall be made absolutely air tight.
- D. Furnish flexible connections between all duct work and fans or fan coil units. Connections shall be flame proof and waterproof 16 ounce canvas of not less than 4" in length and secured in an airtight manner.

### 3.02 DIFFUSERS

- A. Diffusers, grilles and registers are scheduled on the drawings. Center all diffusers to coordinate with reflected ceilings, lighting, speakers, etc. All wall mounted outlets shall be prime coated. All ceiling mounted outlets and returns shall be natural aluminum satin finished; air testing in accordance with SMACNA standards.
- B. Furnish opposed blade volume controls to provide control of the air flow for all supply and return diffusers and registers. Operation shall be from face of the grille with a removable key.
- C. Door grilles shall be slight tight core and vision proof from any angle. Grilles shall be prime coated unless otherwise shown on the drawings. Center the door fixed panel.
- D. Diffusers, grilles and registers as manufactured by Titus, Barber Coleman, Kruger, Carnes or Grillmaster.
- E. Contractor to balance the airflow as indicated on the drawings in accordance with ASHRAE Standards.

### 3.03 INSULATION

- A. Rectangular duct work, both supply and return, shall be insulated with 1" thick 2 pound density duct liner with vinyl sprayed surface to the air side. The liner shall be installed in accordance with duct liner standards of SMACNA. Return duct insulated only if indicated on the plans.
- B. Round duct work shall be insulated with 2" thick fiberglass insulation with fire resistive vapor barrier jacket.
- C. Insulate kitchen exhaust duct with 2" thick fiberglass with fire resistive vapor barrier jacket.

### 3.04 FLUES

- A. All gas flues shall be double wall type B with 6" clearance between roofing material and flue. Flues shall terminate above roof with rain cap, roof jack and counter flashing, in compliance with the gas code.

END OF SECTION



SECTION 26 00 00

ELECTRICAL

PART 1 - GENERAL

1.01 CONDITIONS

- A. Furnish all labor, materials, equipment and services to complete the electrical work as shown on the drawings or as specified. Refer to the General Conditions, Supplemental General Conditions and other sections below, as they apply.

1.02 RELATED SECTIONS

- A. Section 22 00 00 - Mechanical - General

1.03 SCOPE

- A. Furnish and install all electrical systems complete in every respect and ready to operate. Furnish all miscellaneous items and accessories required for such installation, whether or not each such item or accessory is shown on the drawings or mentioned in these specifications.
- B. The work shall consist of, but is not limited to the following general items:

- 1. Lighting Fixtures and Lamps
- 2. Raceways
- 3. Wiring Devices and Plates
- 4. Branch Circuits
- 5. Control Wiring
- 6. Panelboards

1.04 SUBMITTALS

- A. Submit under provisions of Section 013300
- B. Submit shop drawings for:
  - 1. Lighting Fixtures and Lamps
  - 2. Wiring Devices and Plates
  - 3. Safety Disconnect Switches
  - 4. Control Wiring for all Mechanical Systems
  - 5. Panelboards

PART 2 - PRODUCTS

## 2.01 MATERIALS

- A. Submit material lists for all raceways and connectors, conductors and their connectors, boxes and grounding facilities.

## PART 3 - EXECUTION

### 3.01 RACEWAYS

- A. **GENERAL:** Provide raceways for all wiring systems, minimum 3/4 inch. Raceways shall include rigid galvanized steel, conduit, rigid aluminum conduit, (EMT) electrical metallic tubing, flexible metallic conduit, surface metal raceways, wire ways and troughs. Raceways shall be mechanically and electrically continuous from service entrance to final outlet. Raceways shall be run perpendicular and parallel to building construction. Except in Mechanical Rooms or as otherwise noted, all raceways shall be concealed. All breaks and turns with exposed raceways shall be made with malleable iron cadmium or hot dipped galvanized conduit fittings and covers. Raceways shall be rigidly supported with malleable iron conduit clamps or trapeze supports and clamps at intervals not exceeding 7 feet with 12 inches of all outlet boxes, elbows, and changes of direction. Concealed raceways shall be supported from structural members and not furring. All raceway systems shall be completely installed and secured and swabbed out, and all work in the area shall have progressed sufficiently to prevent injury to cables, before any conductors are installed. Provide caps and plugs on ends of raceways and openings in boxes to prevent foreign material from entering during construction. Provide double locknuts where 1 1/2 inch and larger conduits terminate, where No. 4 and larger conductors are installed, and where required by NEC. Do not use running threads. Leave No. 12 pull wire (identified at both ends) in all empty raceways. Provide plastic insulating busing on all conduit connections and fiber inserts on all tubing connections. Surface metal raceways, surface wiremold and surface metal troughs shall be installed only where shown on the drawings.
- B. **RIGID CONDUIT:** Provide rigid galvanized steel conduits for service entrance, panel feeders and all motor feeders. Threadless fittings, all thread and running threads shall not be used. Rigid conduits shall be provided for all raceway systems run underground or embedded in concrete or solid masonry. Rigid conduit shall be as manufactured by Youngstown, Allied, Triangle, or equal. Conduits located underground shall be PVC or shall be rigid galvanized steel and have an additional coat of polyvinylchloride and shall be manufactured by Robroy, or equal.
- C. **ELECTRICAL METALLIC TUBING (EMT):** Electrical metallic tubing (EMT) may be used for conduits concealed in furred ceilings or walls, run exposed in the building, or embedded in hollow masonry construction above grade. EMT shall be as manufactured by Triangle, Allied, Republic, or equal. EMT fittings shall be ferrous metal galvanized or plated to resist corrosion and shall be of the compression-ring type, rain-tight and concrete-tight. Set screw, indenter or friction type fittings will not be allowed. All fittings shall be wrench tight and shall have insulated throats. Fittings shall be as manufactured by Steel City, Raco, Appleton, or equal.
- D. **FLEXIBLE CONDUIT:** Provide flexible conduit for all connections to motors and other equipment subject to vibration or motion with a maximum length of 18 inches. Flexible conduit may be used for final connection to lighting fixtures in lay-in ceilings. Conduit shall be rigidly supported where connection to flexible conduit is made. Conduit and fittings shall be self-grounding and, in addition, copper bonding jumpers shall be used. Flexible conduit shall be as manufactured by Republic, Anaconda, Pittsburg, or equal. Connectors shall be ferrous metal, galvanized or plated to resist corrosion, of the two (2) screw clamp type, or the squeeze type, as manufactured by Raco, Appleton, Steel City, or equal. Flexible conduit and fittings used outdoors or in other areas subject to moisture shall be

of the liquid-tight type with connectors having an O-ring assembly. Liquid tight connectors shall be Raco type 3500, Appleton STB, or equal.

- E. CONDUIT HANGERS AND SUPPORTS: All conduits shall be rigidly supported and securely fastened to structural members. Perforated iron straps or wire shall not be used for support. Maximum support spacing shall be five (5) foot for one (1) inch and smaller conduits, and seven (7) foot for conduits larger than one (1) inch. All conduit shall be installed to permit expansion and contraction, and type hanger, method of support, location of support, etc. shall be governed in part by this consideration.

### 3.02 OUTLET, JUNCTION AND PULL BOXES

- A. Provide outlet and junction boxes where shown on the drawings or as required by Code. Boxes shall be independently rigidly supported and accessible. All outlet boxes shall be minimum of two (2) inches deep. Provide a four (4) inch square box with plaster ring and cover at each switch and receptacle location. Wiring device boxes located in brick, block or concrete walls shall be approved for the type of installation being at mortar joints. Multi-gang boxes shall be installed for more than two (2) adjacent devices; sectional boxes will not be allowed. All exposed cover plates as manufactured by Crouse Hinds, or equal. Outlets exposed to the weather shall be type FD with weatherproof gaskets and covers. Pull boxes shall be constructed of code gauge galvanized steel and shall be sized not less than 1 1/2 times all dimensions as recommended by the NEC. All conductors in pull boxes shall be identified with tags.

### 3.03 CONDUCTORS

- A. All conductors shall be rated 600 volts, and shall be copper with type THHN insulation. Minimum size shall be No. 12 and No. 8, and larger shall be stranded. All conductors shall be color coded, with sizes through No. 10 being of the solid compound coating. Stripes, bands or hash marks with respective color coding may be used for conductors No. 8 and larger. Color coding shall be phase A - black, phase B - red, phase C - blue, neutral - white, and ground - green. All conductors shall be by the same manufacturer and shall be Triangle, Simplex, Anaconda, General, Okonite, or equal.
- B. Mains and feeders shall be run continuous without joints or splices. Branch circuit splices shall be made with 3M "Scotchlocks," or equal. In panelboards and boxes, conductors shall be neatly placed in phase groups and supported away from all enclosure sides. Lacing shall be done at intervals not greater than six (6) inches and shall be done with linen cord or T & B self-locking "Ty-Raps," or equal.

### 3.04 LIGHTING FIXTURES

- A. Provide all lighting fixtures as noted on the drawings. Fixtures shall be suspended from structural members or from ceiling structural members, by standard bar hangers, or other approved means. Structural steel necessary to support fixtures shall be furnished and installed under this Section. Provide plaster frames as required. All fixtures shall be grounded. Fixtures shall be completely wired and lamped and shall be in perfect condition and operating at the time of completion. New building fixtures shall not be used for construction lighting.
- B. Fixture locations shall be coordinated with ceiling patterns or other details or notes as shown on the drawings.
- C. If a lighting fixture for a specific location is not clearly noted, the Contractor shall bring it to the attention of the Engineer prior to bidding, or the Contractor shall furnish and install a fixture similar and comparable in cost to that specified for other like location.

### 3.05 LAMPS

- A. Provide and install lamps in lighting fixtures.

### 3.06 WIRING DEVICES AND PLATES

- A. Furnish and install all wiring devices and plates where shown on the drawings and herein specified. All devices shall be NEMA rated specification grade, with all parts except terminals totally enclosed, and with each device separately packaged upon arrival at job site. Height of wiring device shall work with brick joints and concrete block joints, but in general, lighting switches shall be mounted 4'-0" above floor, and receptacles and telephone outlets shall be mounted 12" above floor. Adjacent wiring devices shall be mounted as close to each other as possible. All wiring devices shall be side wired.
- B. Wiring devices and plate color shall be selected by the Owner.

### 3.07 SAFETY DISCONNECT SWITCHES

- A. Furnish and install safety disconnect switches where shown on the Drawings or as required by NEC. Switches shall be NEMA heavy duty, horsepower rated, with padlocking provisions and with a nameplate identifying equipment served. In wet or exterior locations, switches shall be in NEMA 3R enclosures. Switches shall be as manufactured by Square "D", General Electric, Westinghouse, ITE, or equal.

### 3.08 GROUNDING

- A. The entire electrical system and the building structure shall be grounded, or as indicated on the drawings. The electric service, equipment and enclosures, conduits and raceways, switches, breakers and panels, motors, controllers, lighting fixtures and receptacles shall be grounded. Each branch or power circuit shall have an independent grounding conductor whether shown or not, with the exception of lighting switches.
- B. Bonding jumpers shall be installed to maintain continuity at water meters, connections shall be made with approved clamps as manufactured by Burndy.

### 3.09 GROUND FAULT CIRCUIT INTERRUPTERS

- A. Conformance with UL Std. 943, Class A.
- B. Temperature tolerance level of -31° to 158F.
- C. Equal to Leviton Suregard V, NEMA 5-15R, Model 6598-W with indicator light, 15A, 125 volt.

## PART 4 – ENGINE GENERATOR

### 4.01 SUMMARY

- A. This section includes the following items from a single supplier:
  - 1. Engine Generator Set.



2. Enclosure
3. Related Accessories as specified

B. Related Requirements

1. It is the intent of this specification to secure an engine-driven generator set that has been prototype tested, factory built, production-tested, and site-tested together with all accessories necessary for a complete installation as shown on the plans and drawings and specifications herein.
2. It is the intent of this specification to secure a generator set system that has been tested during design verification, in production, and at the final job site. The generator set will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, drawings, and specifications herein. The equipment supplied shall meet the requirements of the National Electrical Code and applicable local codes and regulations.
3. All equipment shall be new and of current production by an international, power system manufacturer of generators, transfer switches, and paralleling switchgear. The manufacturer shall be a supplier of a complete and coordinated system. There will be single-source responsibility for warranty, parts, and service through a factory-authorized representative with factory-trained technicians.

#### 4.02 SUBMITTALS

A. Action Submittals

1. Product Data
  - a. The submittal shall include prototype test certification and specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer switch, and the remote annunciator panel if it is included elsewhere in these specifications.
2. Shop Drawings
3. Samples

B. Informational Submittal

1. Certificates
  - a. The generator set shall be listed to UL 2200 or submitted to an independent third party certification process to verify compliance as installed.
2. Test and Evaluation Reports
3. Manufacturer's Instruction
4. Source Quality Control Submittals
5. Field or Site Quality Control
6. Manufacturer's Report
7. Special Procedure Submittal
8. Qualification Statement

C. Closeout Submittal

1. Maintenance Contracts
2. Operation And Maintenance Data
3. Bonds
4. Warranty Documentation
5. Record Documentation

6. Software

D. Maintenance Material Submittals

4.03 QUALITY ASSURANCE

A. Regulatory Agency

1. The generator set shall conform to the requirements of the following codes and standards:
  - a. CSA C22.2, No. 14-M91 Industrial Control Equipment.
  - b. EN50082-2, Electromagnetic Compatibility-Generic Immunity Requirements, Part 2: Industrial.
  - c. EN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
  - d. IEC8528 part 4, Control Systems for Generator Sets.
  - e. IEC Std 61000-2 and 61000-3 for susceptibility, 61000-6 radiated and conducted electromagnetic emissions.
  - f. IEEE446 Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications.
  - g. NFPA 70, National Electrical Code, Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
  - h. NFPA 99, Essential Electrical Systems for Health Care Facilities.
  - i. NFPA 110, Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit. Component level type tests will not substitute for this requirement.
2. Qualifications
  - a. The equipment shall be produced by a manufacturer who is ISO 9001 certified for the design, development, production and service of its complete product line.
  - b. The power system shall be produced by a manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains a service organization available twenty-four hours a day throughout the year.
3. Manufacturers
  - a. The power system shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.

4.04 DELIVERY, STORAGE, HANDLING

- A. Delivery and Acceptance Requirements
- B. Storage and Handling Requirements
- C. Packaging Waste Management

4.05 FIELD OR SITE CONDITIONS

A. Ambient Conditions

1. Engine- generator set shall operate in the following conditions without any damage to the unit or its loads.
  - a. Ambient Temperature: 77 °F

- b. Altitude : 500 ft
- c. Relative Humidity: 95%

#### 4.06 WARRANTY OR BOND

##### A. Manufacturer's Warranty

1. The generator set shall include a standard warranty covering one (1) year or 2000 hours, whichever occurs first, to guarantee against defective material and workmanship in accordance with the manufacturer's published warranty from the date of initial startup.
2. The generator set manufacturer and its distributor shall maintain a 24-hour parts and service organization. This organization shall regularly engage in maintenance contract programs to perform preventive maintenance and service on equipment similar to that specified. A service agreement shall be available and shall include system operation under simulated operating conditions; adjustment to the generator set, transfer switch, and switchgear controls as required, and certification in the owner's maintenance log of repairs made and functional tests performed on all systems.

### PART 5 - PRODUCTS

#### 5.01 EQUIPMENT

##### A. Equipment

1. The generator set shall be a Kohler model 250REZXB with a 4UA10 alternator. It shall provide 325.00 kVA and 260.00 kW when operating at 120/208 volts, 60 Hz, 0.80 power factor. The generator set shall be capable of a 130°C Standby @40C rating while operating in an ambient condition of less than or equal to 77 °F and a maximum elevation of 500 ft above sea level. The standby rating shall be available for the duration of the outage. Provide weatherproof enclosure.

##### B. Engine

1. The minimum 14.6 liter displacement engine shall deliver a minimum of 402 HP at a governed engine speed of 1800 rpm, and shall be equipped with the following:
  - a. Electronic isochronous governor capable of 0.5% steady-state frequency regulation
  - b. 24-volt positive-engagement solenoid shift-starting motor
  - c. 45-ampere automatic battery charging alternator with a solid-state voltage regulation
  - d. Positive displacement, full-pressure lubrication oil pump, cartridge oil filters, dipstick, and oil drain
  - e. Dry-type replaceable air cleaner elements for normal applications
  - f. The engine shall be turbocharged and fueled by Natural Gas
  - g. The engine shall have a minimum of 8 cylinders and be liquid-cooled
2. The engine shall be EPA certified from the factory
3. The generator must accept rated load in one-step.

##### C. Cooling System

1. The engine shall be liquid-cooled by a closed loop, unit mounted radiator rated to operate the generator set at full load at an ambient temperature of 50 degrees C (122 degrees F). The radiator fan and other rotating engine parts shall be guarded against accidental contact.

##### D. Standard Air Cleaner

1. The air cleaner shall provide engine air filtration which meets the engine manufacturer's specifications under typical operating conditions.

E. Battery

1. Each genset requires a BCI group 31 batteries which must meet the engine manufactures' specifications for the ambient conditions specified in Part 1 Project Conditions and shall comply with the NFPA requirements for engine cranking cycles. Each battery shall be rated according to SAE Standards J-537 with a minimum cold cranking amp of 950 amps and a minimum reserve capacity of 185 Minutes at 80F. The battery plates shall be constructed of a Calcium-Lead alloy to provide long waterless operation and extended battery life. The battery elements must be anchor-locked with full-frame grids and tight-packed commercial plates to resist the effects of vibration. The battery must contain a handle to aid in lifting and the case must be constructed of polypropylene to resist breakage and extend service life. Removable cell covers shall be provided to allow for checking of electrolyte specific gravity.
2. Battery rack and battery cables capable of holding the manufacturer's recommended batteries shall be supplied.

F. Controller

1. Decision-Maker® 6000 Controller
  - a. The generator set controller shall be a microprocessor based control system that will provide automatic starting, system monitoring, and protection. The controller system shall also provide local monitoring and remote monitoring. The control system shall be capable of PC based updating of all necessary parameters, firmware, and software.
  - b. The controller shall be mounted on the generator set and shall have integral vibration isolation. The controller shall be prototype and reliability tested to ensure operation in the conditions encountered.
2. Codes and Standards
  - a. The generator set controller shall meet NFPA 110 Level 1 requirements and shall include an integral alarm horn as required by NFPA.
  - b. The controller shall meet NFPA 99 and NEC requirements.
  - c. The controller shall be UL 508 listed.
3. Applicability
  - a. The controller shall be a standard offering in the manufacturer's controller product line.
  - b. The controller shall support 12-volt and 24volt starting systems.
  - c. The controller's environmental specification shall be: -40°C to 70°C operating temperature range and 5-95% humidity, non-condensing.
  - d. The controller shall mount on the generator or remotely within 40 feet with viewable access.
4. Hardware Requirements
  - a. Control Panel shall include:
    - (1) A run-off/reset-auto three position selector switch and three pushbuttons for OFF, AUTO and RUN
    - (2) Emergency Stop Switch. The controller mounted, latch type remote stop switch shall be red in color with a "mushroom" type head. Depressing the stop button will immediately stop the generator set and lockout the generator set for any automatic remote starting.
    - (3) Twelve indicating lights (LED):
      - (a) System Ready - green
      - (b) Not in Auto - yellow
      - (c) Programming Mode - yellow
      - (d) System Warning – yellow
      - (e) System Shutdown – red
      - (f) Off – Red
      - (g) Auto – Green
      - (h) Run – Yellow
      - (i) Open – Green

- (j) Close – Red
  - (k) Generator Power – Red
  - (l) Sync - Green
  - (4) Digital Display. The digital display shall be a vacuum fluorescent display with two lines of alphanumeric, with 2 lines of data and 20 characters. The display shall be viewable in all light conditions. The display shall display status of all faults and warnings. The display shall also display any engine faults. The 16-button keypad gives the user information access and local programming capability.
  - (5) Sixteen-position snap action environmentally sealed tactile-feel membrane keypad for menu selection and data entry.
  - (6) For ease of use, an operating guide shall be printed on the controller faceplate.
  - (7) Alarm Horn. The controller shall provide an alarm horn that sounds when any faults or warnings are present. The horn shall also sound when the controller is not in the AUTO mode.
  - (8) Panel lights shall be supplied as standard.
  - (9) Alarm Off. This button will silence the alarm horn when the unit is AUTO.
  - (10) A keyed switch shall be supplied for locking and unlocking of controller function.
  - (11) Lamp Test Button. When this button is depressed, it shall test all controller lamps.
5. Control Functional Requirements
- a. The generator controller shall display and monitor the following engine and alternator functions and allow adjustments of certain parameters at the controller:
    - (1) Field-programmable time delay for engine start. Adjustment range 0-5 minutes in 1 second increments.
    - (2) Field-programmable time delay engine cool down. Adjustment range 0-10 minutes in 1 second increments.
    - (3) Capability to start and run at user-adjustable idle speed during warm-up for a selectable time period (0-10 minutes), until engine reaches preprogrammed temperature, or as supported by ECM-equipped engine.
    - (4) The idle function including engine cooldown at idle speed.
    - (5) Real-time clock and calendar for time stamping of events.
    - (6) Output with adjustable timer for an ether injection starting system. Adjustment range, 0-10 seconds
    - (7) Output for shedding of loads if the generator set reaches a user programmable percentage of its kW rating. Load shed shall also be enabled if the generator set output frequency falls below 59 Hz.
    - (8) Programmable cyclic cranking that provides up to 30 seconds of programmable cyclic cranking and up to 60 seconds rest with up to 6 cycles.
    - (9) The capability to reduce controller current battery draw, for applications where no continuous battery charging is available. The controller vacuum fluorescent display should turn off automatically after the controller is inactive for 5 minutes.
    - (10) Control logic with alternator protection for overload and short circuit matched to each individual alternator and duty cycle.
    - (11) Control logic with RMS digital voltage regulation. The system shall have integral microprocessor based voltage regulator system that provides +/- 0.25% voltage regulation no-load to full load with three phase sensing. A separate voltage regulator is not acceptable. The digital voltage regulator shall be applicable to single- or three-phase systems. The system shall be prototype tested and control variation of voltage to frequency. The voltage regulator shall be adjustable at the controller with maximum +/- 20% adjustable of nominal voltage.
    - (12) The capability to exercise the generator set by programming a running time into the controller. This feature shall also be programmable through the PC software.
    - (13) Alternator thermal overload protection. The system shall have integral alternator overload and short circuit protection matched to each alternator for the particular voltage and phase configuration.

- (14) Control function shall include output voltage adjustment.
- (15) Battle switch function selection to override normal fault shutdowns, except emergency stop and over speed shutdowns.
- (16) The control shall detect the following conditions and display on control panel:
  - (a) Customer programmed digital auxiliary input ON (any of the 21 inputs available)
  - (b) Customer programmed analog auxiliary input out of bounds (any of 7 inputs for ECM equipped engines and 5 inputs for non ECM engines)
  - (c) Emergency stop
  - (d) Exceed Alternator Thermal Limit
  - (e) High coolant temperature
  - (f) High oil temperature
  - (g) Controller internal fault
  - (h) Locked rotor - fail to rotate
  - (i) Loss of ECM communications
  - (j) Loss of speed sensor signal
  - (k) Low battery voltage
  - (l) Low coolant level
  - (m) Low coolant temperature
  - (n) Low fuel level
  - (o) Low oil pressure
  - (p) Master switch error
  - (q) NFPA common alarm
  - (r) Oil pressure gauge signal loss
  - (s) Overcrank
  - (t) Overcurrent
  - (u) Overspeed with user-adjustable level, range 60-70 Hz systems and 55-70 Hz on 50 Hz systems.
  - (v) Overvoltage with user adjustable level, range 105% to 135%
  - (w) Overfrequency with user adjustable level, range 102% to 140%
  - (x) Underfrequency with user adjustable level, range 80% to 90%
  - (y) Undervoltage with user adjustable level, range 70% to 95%
  - (z) Coolant temperature signal loss
- (17) Conditions resulting in generator warning (generator will continue to operate):
  - (a) Alternator protection activated
  - (b) Auto synch disabled
  - (c) Battery charger failure
  - (d) Battle switch (fault shutdown override switch)
  - (e) Circuit breaker close attempts fault
  - (f) Circuit breaker close fault
  - (g) Circuit breaker current fault
  - (h) Circuit breaker open fault
  - (i) Circuit breaker common fault
  - (j) Common protective relay
  - (k) Customer programmed digital auxiliary input on (any of the 21 inputs available)
  - (l) Customer programmed analog auxiliary input on (any of the 7 inputs available on ECM engines and 5 inputs for non ECM engines)
  - (m) Dead bus sensing fault
  - (n) De-rate active
  - (o) Emergency power system (EPS) supplying load
  - (p) External circuit breaker trip
  - (q) First on fault
  - (r) Frequency matched
  - (s) Genset parameter warning
  - (t) Genset serial number warning

- (u) Ground fault detected - detection by others
  - (v) High battery voltage - Level shall be user adjustable. (Range 29-33 volts for 24-volt systems.)
  - (w) High coolant temperature
  - (x) High oil temperature
  - (y) Key switch locked
  - (z) Key switch unlocked
  - (aa) Load shed common
  - (bb) Load shed kW over
  - (cc) Load shed underfrequency
  - (dd) Loss of AC sensing
  - (ee) Low battery voltage - level shall be user adjustable (Range 20-25 volts for 24-volt systems.)
  - (ff) Low coolant temperature
  - (gg) Low oil pressure
  - (hh) Low fuel level or pressure
  - (ii) Maintenance due
  - (jj) Master switch in auto
  - (kk) NFPA 110 common alarms
  - (ll) Overcurrent
  - (mm) Phased matched.
  - (nn) Speed sensor fault
  - (oo) Starting aid delay
  - (pp) Synch timeout
  - (qq) Voltage matched
  - (rr) Underfrequency
  - (ss) Weak battery
- (18) Available user functions resulting in a generator warning (generator will continue to operate). These functions shall be available pending engine and fuel type:
- (a) Analog auxiliary input
  - (b) ECM yellow alarm
  - (c) Idle mode digital auxiliary input
  - (d) Intake air temperature
  - (e) Digital auxiliary input
  - (f) Low coolant level
  - (g) Low fuel level
  - (h) Low fuel pressure
- (19) Conditions resulting in generator shutdown:
- (a) Alternator protection
  - (b) Controller setup error
  - (c) Critical overvoltage
  - (d) Defined common fault
  - (e) Emergency stop
  - (f) EEPROM write failure
  - (g) Field overvoltage
  - (h) Frequency selection error
  - (i) High coolant temperature
  - (j) High oil temperature
  - (k) Internal fault
  - (l) kW selection error
  - (m) Locked rotor
  - (n) Loss of AC sensing
  - (o) Loss of ECM communication
  - (p) Loss of field
  - (q) Low coolant level

- (r) Low coolant temperature
- (s) Low oil pressure
- (t) Master switch error
- (u) Master switch open
- (v) Master switch to off
- (w) NFPA 100 fault
- (x) No coolant temperature signal
- (y) No oil pressure signal
- (z) Overcrank
- (aa) Overspeed
- (bb) Overcurrent
- (cc) Overcurrent voltage regulator
- (dd) Overfrequency
- (ee) Overpower
- (ff) Overvoltage
- (gg) Phase selection error
- (hh) Remote shutdown
- (ii) Reverse power
- (jj) Reverse kVAR
- (kk) Starter motor "A" failure
- (ll) Starter motor "B" failure
- (mm) Time delay circuit breaker trip to shutdown
- (nn) Underfrequency
- (oo) Undervoltage
- (pp) olt switch error

(20) Available user functions resulting in a generator shutdown. These functions shall be available pending engine and fuel type:

- (a) Analog auxiliary inputs
- (b) Digital auxiliary inputs
- (c) ECM red alarm
- (d) Intake air temperature

6. Control Monitoring Requirements

a. The generator set shall have alarms and status indication lamps that show non-automatic status and warning and shutdown conditions. The controller shall indicate with a warning lamp and or alarm and on the digital display screen any shutdown, warning or engine fault condition that exists in the generator set system. The following alarms and shutdowns shall exist as a minimum:

- (1) All monitored functions must be viewable on the control panel display.
- (2) The following generator set functions shall be monitored:
  - (a) All output voltages - single phase, three phase, line to line, and line to neutral, 0.25% accuracy
  - (b) All single phase and three phase currents, 0.25% accuracy
  - (c) Output frequency, 0.25% accuracy
  - (d) Power factor by phase with leading/lagging indication
  - (e) Total instantaneous kilowatt loading and kilowatts per phase, 0.5% accuracy
  - (f) kVARS total and per phase, 0.5% accuracy
  - (g) kVA total and per phase, 0.5% accuracy
  - (h) kW hours
  - (i) A display of percent generator set duty level (actual kW loading divided by the kW rating)
- (3) Engine parameters listed below shall be monitored: (\*available with ECM equipped engines)
  - (a) Coolant temperature both in English and metric units
  - (b) Oil pressure in English and metric units
  - (c) Battery voltage



- (d) RPM
  - (e) Lube oil temperature\*
  - (f) Lube oil level\*
  - (g) Crankcase pressure\*
  - (h) Coolant level\*
  - (i) Coolant pressure\*
  - (j) Fuel pressure\*
  - (k) Fuel temperature\*
  - (l) Fuel rate\*
  - (m) Fuel used during the last run\*
  - (n) Ambient temperature\*
- (4) Operational records shall be stored in the control beginning at system startup.
- (a) Run time hours.
  - (b) Run time loaded hours
  - (c) Run time unloaded hours
  - (d) Number of starts
  - (e) Factory test date
  - (f) Last run data including date, duration, and whether loaded or unloaded
  - (g) Run time kilowatt hours
- (5) The following operational records shall be a resettable for maintenance purposes:
- (a) Run time hours
  - (b) Run time loaded hours
  - (c) Run time unloaded hours
  - (d) Run time kilowatt hours
  - (e) Days of operation
  - (f) Number of starts
  - (g) Start date after reset
- (6) The controller shall store the last one hundred generator set system events with date and time of the event.
- (7) For maintenance and service purposes, the controller shall store and display on demand the following information:
- (a) Manufacturer's model and serial number
  - (b) Battery voltage
  - (c) Generator set kilowatt rating
  - (d) Rated current
  - (e) System voltage
  - (f) System frequency
  - (g) Number of phases
- (8) The controller shall support a variety of maintenance parameters including:
- (a) Unloaded hours since last maintenance
  - (b) Loaded hours since last maintenance
  - (c) kW-Hours since last maintenance
  - (d) Last maintenance date
  - (e) Number of starts since last maintenance
  - (f) Minutes of operation since last maintenance
  - (g) Programmable maintenance reminder (1-999 hours)
  - (h) Message to indicate maintenance reminder
  - (i) Programmable digital output for maintenance reminder

7. Inputs and Outputs

a. Inputs

- (1) There shall be 21 dry contact inputs that can be user-configured to shut down the generator set or provide a warning.
- (2) There shall be 7 user-programmable analog inputs for ECM-equipped engines (5 for non-ECM engines) for monitoring and control.
- (3) Each analog input can accept 0-5 volt analog signals

- (4) Resolution shall be 1:10,000 for analog input measurement
- (5) Each input shall include range settings for 2 warnings and 2 shutdowns.
- (6) All warning and shutdown values shall be accessible and adjustable on the control panel display.
- (7) All free input assignments (digital and analog) shall be user selectable.
- (8) Additional standard inputs required:
  - (a) Input for an external ground fault detector. Digital display shall show "ground fault" upon detection of a ground fault.
  - (b) Reset of system faults.
  - (c) Remote two-wire start.
  - (d) Remote emergency stop.
- (9) Digital input (1 of 21) Utility Circuit Breaker, auxiliary closed position contacts.
- (10) Idle mode enable.
- b. Additional Digital Inputs Available as Standard
  - (1) Battery charger fault
  - (2) Battle switch
  - (3) Field overvoltage
  - (4) First on enable
  - (5) Frequency trim enable
  - (6) Generator circuit breaker - auxiliary
  - (7) Generator circuit breaker, overcurrent trip switch (OTS)
  - (8) High oil temperature
  - (9) Idle mode active (ECM models only)
  - (10) kVAR raise/lower
  - (11) PF raise/lower
  - (12) kW raise/lower
  - (13) Load enable
  - (14) Low coolant level
  - (15) Low coolant temperature
  - (16) Low fuel warning
  - (17) Low fuel shutdown
  - (18) Speed raise/lower
  - (19) Synch enable
  - (20) Utility circuit breaker auxiliary
  - (21) Voltage raise/lower
  - (22) Voltage trim enable
- c. Outputs
  - (1) All NFPA 110 Level 1 outputs shall be available.
  - (2) Thirty outputs shall be available for interfacing to other equipment
  - (3) All outputs shall be user-configurable from a list of 25 functions and faults
  - (4) These outputs shall drive optional dry contacts.
  - (5) A programmable user-defined common fault output with over 40 selections shall be available.
  - (6) All functions listed in warnings and shutdowns shall be available as an output
- 8. Communications (Modbus protocol)
  - a. If the generator set engine is equipped with an ECM (engine control module), the controller shall communicate with the ECM for control, monitoring, diagnosis, and meet SAE J1939 standards.
  - b. Industry standard Modbus communication shall be available.
  - c. A Modbus master shall be able to monitor and alter parameters, and start or stop a generator.
  - d. The controller shall have the capability to communicate to a personal computer (IBM or compatible) running Windows XP, or Windows 7 or later.
  - e. Communications shall be available for serial, CAN, and Ethernet bus networks.
  - f. A variety of connections shall be available based on requirements:

- (1) A single control connection to a PC.
  - (2) Multiple controls on an intranet network connected to a PC.
  - (3) A single control connection to a PC via phone line.
  - (4) Multiple controls to a PC via phone line.
  - (5) Any 2 or 3 hardware ports shall be used simultaneously
    - (a) RS-485 (non-isolated)
    - (b) RS-485 (isolated)
    - (c) RS-232
  - g. Generator and transfer switch controls shall be equipped with communications modules capable of connecting to the same communication network.
  - h. The capability to connect up to 128 controls (any combination of generator sets and transfer switches) on a single network shall be supported.
  - i. Cabling shall not be limited to the controller location.
  - j. Network shall be self-powered.
  - k. The controller shall be capable of communicating controller to controller, without additional inputs from an external source.
  - l. The controller shall be capable of communicating with a master control panel that provides generator and load management capability.
  - m. The controller shall have been factory prototype tested as part of the complete paralleling system:
    - (1) Decision Maker 6000 - Paralleling Controller
    - (2) MCP 3000 - Master Control Panel
    - (3) Load distribution switchboards
    - (4) Motorized circuit breakers
9. Synchronization
- a. The controller shall monitor the voltage on two phases at the output side of the generator circuit breaker.
  - b. The controller shall recognize a dead bus.
  - c. The controller shall communicate with all other controllers and use first-on logic to determine which generator will close to the dead bus first.
  - d. The controller shall recognize a live bus.
  - e. The controller shall be configurable for automatic synchronization to a live bus.
  - f. The controller shall support 3 common forms of synchronizing, Automatic (synch and close breaker), Test-Check (synch - no closure) and Permissive (no active synch, allow manual closure if in synch).
  - g. The controller shall have adjustable parameters for acceptable synchronization.
  - h. The controller shall have adjustable control parameters for achieving synchronism; voltage match gain, frequency match gain, phase match gain.
  - i. The controller shall have integral speed and voltage, raise/lower control for manual synchronizing.
  - j. The controller shall be capable of accepting digital inputs (contact closure) for speed and voltage raise/lower.
  - k. The controller shall have front panel input capability for speed and voltage, raise and lower.
  - l. The controller shall have a programmable synchronizing time delay, 10 to 600 seconds.
  - m. The controller shall announce a fail to synch fault when synchronization is not achieved within the programmed time delay.
  - n. The controller shall actively maintain synchronizing efforts to achieve synchronization even after the time delay has expired.
  - o. The controller shall have a control means to disable a generator from closing to a dead bus (first on enable) when such operation is desired (i.e. a similar emergency generator).
  - p. The controller shall be capable of actively displaying the synchronizing parameter values for both the generator and the bus when synchronizing; voltage, frequency and phase.
  - q. The controller shall be capable of displaying the phase rotation (ABC or CBA) for both the

- generator and the bus.
  - r. The controller shall be capable of paralleling generators that are of different kW rating, fuel type and/or alternator.
  - s. The controller shall prevent closure to the bus when phase rotation does not match the generator.
  - t. The controller shall communicate to all other controllers the status of its generator breaker (closed or open) to prevent closure to a dead bus when a breaker is closed.
  - u. The controller shall communicate to all other controllers the status of the utility breaker (closed or open) to prevent closure to a dead bus when the utility breaker is closed.
10. Circuit Breaker Control
- a. The controller shall be capable of operating the circuit breaker to apply electricity to the parallel electrical bus.
  - b. The controller system shall have a normally closed contact (fail safe) that will keep the generator breaker tripped until such conditions are met to allow closure.
  - c. The controller system shall have a normally open contact to provide an energizing signal to close the generator circuit breaker.
  - d. The controller system shall have normally open contact for control of a contactor.
  - e. The energizing time, for breaker closure, shall be user programmable between 0.1 and 10 seconds.
  - f. There shall be a programmable re-close time delay, 0.5 to 10 seconds.
  - g. The controller shall allow a programmable, 1-100, number of closure attempts.
  - h. The controller will announce a Fail to Close warning when closure is not detected after 1 closure attempt.
  - i. The controller will announce a First on Fail warning when closure is not detected after 1 closure attempt when closing to a dead bus.
  - j. The controller will announce a Close Attempts Fault when the number of attempts exceeds the setting (max attempts).
  - k. The controller will monitor current to detect a failure to open the generator circuit breaker.
  - l. The controller will keep the generator running until the generator circuit breaker is seen open in order to keep the bus live to prevent other devices from closing to this bus without synchronizing.
  - m. The controller shall accept open commands (digital input or front panel button) to trip the generator breaker on demand.
  - n. The controller shall accept close commands (digital input or front panel button) to close the generator breaker on demand, when synchronized and/or a dead bus is detected.
11. Protective Relays
- a. The controller shall provide a standard set of protective relay functions with programmable limits and time delays.
    - (1) Over Voltage (59)
      - (a) User Adjustable Range, 100% to 130%
      - (b) User Adjustable Range Time Delay, 0- 120 seconds
    - (2) Under Voltage (27)
      - (a) User Adjustable Range, 70% to 100%
      - (b) User Adjustable Time Delay, 0- 120 seconds
    - (3) Over Frequency (81O)
      - (a) User Adjustable Range, 100% to 140%
      - (b) User Adjustable Time Delay, 0- 120 seconds
    - (4) Reverse Power (32R)
      - (a) User Adjustable Range, 0% to 50%
      - (b) User Adjustable Time Delay, 0- 120 seconds
    - (5) Over Power (32O)
      - (a) User Adjustable Range, 90% to 150%
      - (b) User Adjustable Time Delay, 0- 120 seconds

- (6) Loss of Field (40 Reverse VARS)
    - (a) User Adjustable Range, 10% to 100%
    - (b) User Adjustable Time Delays, 0- 120 seconds
  - (7) Over Current with Voltage Range
    - (a) User Adjustable Range, 100% to 200%
    - (b) User Adjustable Time Delay, 0- 120 seconds
12. Communications (RBUS protocol)
- a. If the generator set engine is equipped with an ECM (engine control module), the controller shall communicate with the ECM for control, monitoring, diagnosis, and meet SAE J1939 standards.
  - b. Kohler proprietary RBUS communication shall be available.
  - c. A RBUS shall be able to monitor and alter parameters, and start or stop a generator.
  - d. The controller shall have the capability to communicate to a personal computer (IBM or compatible) and appropriate application software.
  - e. A variety of connections shall be available based on requirements:
    - (1) A single control connection to a PC via USB
    - (2) Internet connection via Ethernet
  - f. Generator and transfer switch controls shall be equipped with communications modules capable of connecting to the same communication network.

#### G. Generator Overcurrent and Fault Protection

1. The generator shall be provided with a factory installed, 100% rated line circuit breaker rated at 0.00 amperes that is UL489 listed. Line circuit breakers shall be sized for the rated ampacity of the loads served by the breaker per the NEC.
2. The circuit breaker(s) shall incorporate an electronic trip device with the following characteristics:
3. Adjustable long time delay
4. Adjustable short time delay [*As applicable*]
5. Instantaneous
6. Load side lugs shall be provided from the factory. The line circuit breaker shall include auxiliary contacts, shunt trip, undervoltage trip, alarm switch, and overcurrent switch functionality. Load side breaker connections made at the factory shall be separated from field connections.
7. The shunt trip device shall be connected to trip the generator breaker when the generator-set is shut down by other protective devices.
8. When GFI is required per the NEC, additional neutrals shall be factory installed, and the alarm indication shall be integrated with the generator-set alarms.
9. Barriers to provide segregation of wiring from an emergency source to emergency loads from all other wiring and equipment, if required by the NEC, shall be provided.

#### H. Alternator

1. The alternator shall be salient-pole, brushless, 2/3-pitch, with 4 bus bar provision for external connections, self-ventilated, with drip-proof construction and amortisseur rotor windings, and skewed for smooth voltage waveform. The ratings shall meet the NEMA standard (MG1-32.40) temperature rise limits. The insulation shall be class H per UL1446 and the varnish shall be a vacuum pressure impregnated, fungus resistant epoxy. Temperature rise of the rotor and stator shall be limited to 130°C Standby @40C. The PMG based excitation system shall be of brushless construction controlled by a digital, three phase sensing, solid- state, voltage regulator. The AVR shall be capable of proper operation under severe nonlinear loads and provide individual adjustments for voltage range, stability and volts-per-hertz operations. The AVR shall be protected from the environment by conformal coating. The waveform harmonic distortion shall not exceed 5% total RMS measured line-to-line at full rated load. The TIF factor shall not exceed 50.
2. The alternator shall have a maintenance-free bearing, designed for 40000 hour B10 life. The alternator shall be directly connected to the flywheel housing with a semi-flexible coupling between the rotor and the flywheel.

3. The generator shall be inherently capable of sustaining at least 300% of rated current for at least 10 seconds under a 3-phase symmetrical short circuit without the addition of separate current-support devices.
4. Motor starting performance and voltage dip determinations shall be based on the complete generator set. The generator set shall be capable of supplying 590.00 LRKVA for starting motor loads with a maximum instantaneous voltage dip of 35%, as measured by a digital RMS transient recorder in accordance with IEEE Standard 115. Motor starting performance and voltage dip determination that does not account for all components affecting total voltage dip, i.e., engine, alternator, voltage regulator, and governor will not be acceptable. As such, the generator set shall be prototype tested to optimize and determine performance as a generator set system.

I. Vibration Isolation

1. Vibration isolators shall be provided between the engine-alternator and heavy-duty steel base.

5.03 ACCESSORIES

- A. Battery rack and battery cables capable of holding the manufacturer's recommended batteries shall be supplied.
- B. The generator set shall be supplied with a 10-ampere automatic float/equalize battery charger capable of charging both lead-acid and ni-cad type batteries, with the following features:
  1. Automatic 3-stage float to equalization charge
  2. Voltage regulation of 1% from no to full load over 10% AC input line voltage variations
  3. Battery charging current Ammeter and battery voltage voltmeter with 5% full-scale accuracy
  4. LED lamp for power ON indication
  5. Current limited during engine cranking, short circuit, and reverse polarity conditions
  6. Temperature compensated for ambient temperatures for -40°C to 60°C
  7. UL 1012 Listed
  8. CSA Certified
- C. The generator shall be supplied with a thermostatically controlled strip heater to prevent the accumulation of moisture and dampness and to maintain the stator windings above the dew point. The heater shall be wired to be "on" at all times that the generator set is not operating.
- D. The generator set shall be supplied with a common failure relay to provide means of signaling fault and/or shutdown conditions.
  1. The common failure relay shall remotely signal auxiliary faults, emergency stop, high engine temperature, low oil pressure, overcrank, and over speed via one single-pole, double-throw relay with 10 amps at 120 VAC contacts.
  2. The relay contacts shall be gold flashed to allow use of low current draw devices (100ma @ 28VDC min.).
  3. Once energized the relay shall remain latched until the system is reset by the main controller switch.
- E. Supply flexible fuel lines to provide a flexible connection between the engine fuel fittings and the fuel supply tank piping and for the fuel return lines from the injector pump per engine manufacturer's recommendations. Flex line shall have a protective steel wire braid to protect the hose from abrasion.
- F. Block Heater - The block heater shall be thermostatically controlled, 6,000 watt, with isolating valves, to maintain manufacturers recommended engine coolant temperature to meet the start-up requirements of NFPA 99 and NFPA 110, Level 1.
- G. Supply a Modbus to Ethernet Converter that provides one RJ45 jack for standard Ethernet 10/100 connection, and a terminal block for RS-485 connection, and is powered by 12 VDC. The Baud rate on the Modbus RTU side shall be selectable 9600 or 19200. The converter shall support Simple Network Management Protocol (SNMP) users to poll or issue trap commands.

## 5.04 SOURCE QUALITY-CONTROL

### A. Non-Conforming Work.

1. To ensure that the equipment has been designed and built to the highest reliability and quality standards, the manufacturer and/or local representative shall be responsible for three separate tests: design prototype tests, final production tests, and site tests.
  - a. Design Prototype Tests. Components of the emergency system, such as the engine/generator set, transfer switch, and accessories, shall not be subjected to prototype tests because the tests are potentially damaging. Rather, similar design prototypes and preproduction models shall be subject to the following tests:
    - (1) Maximum power (kW)
    - (2) Maximum motor starting (kVA) at 35% instantaneous voltage dip.
    - (3) Alternator temperature rise by embedded thermocouple and/or by resistance method per NEMA MG1-32.6.
    - (4) Governor speed regulation under steady-state and transient conditions.
    - (5) Voltage regulation and generator transient response.
    - (6) Harmonic analysis, voltage waveform deviation, and telephone influence factor.
    - (7) Three-phase short circuit tests.
    - (8) Alternator cooling air flow.
    - (9) Torsional analysis to verify that the generator set is free of harmful torsional stresses.
    - (10) Endurance testing.
  - b. Final Production Tests. Each generator set shall be tested under varying loads with guards and exhaust system in place. Tests shall include:
    - (1) Single-step load pickup
    - (2) Safety shutdown device testing
    - (3) Rated Power @ 0.8 PF
    - (4) Maximum power
    - (5) Upon request, a witness test, or a certified test record sent prior to shipment.
  - c. Site Tests. The manufacturer's distribution representative shall perform an installation check, startup, and building load test. The engineer, regular operators, and the maintenance staff shall be notified of the time and date of the site test. The tests shall include:
    - (1) Fuel, lubricating oil, and antifreeze shall be checked for conformity to the manufacturer's recommendations, under the environmental conditions present and expected.
    - (2) Accessories that normally function while the set is standing by shall be checked prior to cranking the engine. These shall include: block heaters, battery chargers, alternator strip heaters, remote annunciators, etc.
    - (3) Generator set startup under test mode to check for exhaust leaks, path of exhaust gases outside the building, cooling air flow, movement during starting and stopping, vibration during operation, normal and emergency line-to-line voltage and frequency, and phase rotation.
    - (4) Automatic start by means of a simulated power outage to test remote-automatic starting, transfer of the load, and automatic shutdown. Prior to this test, all transfer switch timers shall be adjusted for proper system coordination. Engine coolant temperature, oil pressure, and battery charge level along with generator set voltage, amperes, and frequency shall be monitored throughout the test.

## PART 6 – GENERAL

### 6.01 SUMMARY

A. This section includes the following items from a single supplier:

1. Automatic transfer switch
2. Related Accessories as specified

B. Related Requirements

1. It is the intent of this specification to secure an automatic transfer switch that has been prototype tested, factory built, production-tested, and site-tested together with all accessories necessary for a complete installation as shown on the plans and drawings and specified herein.
2. It is the intent of this specification to secure an automatic transfer switch that has been tested during design verification, in production, and at the final job site. The automatic transfer switch will be a commercial design and will be complete with all of the necessary accessories for complete installation as shown on the plans, drawings, and specifications herein. The equipment supplied shall meet the requirements of the National Electrical Code and applicable local codes and regulations.
3. All equipment shall be new and of current production by an international, power system manufacturer of generators, transfer switches, and paralleling switchgear. The manufacturer shall be a supplier of a complete and coordinated system. There will be single-source responsibility for warranty, parts, and service through a factory-authorized representative with factory-trained technicians.

## 6.02 SUBMITTALS

A. Action Submittals

1. Product Data

- a. The submittal shall include specification sheets showing all standard and optional accessories to be supplied; schematic wiring diagrams, dimension drawings, and interconnection diagrams identifying by terminal number each required interconnection between the generator set, the transfer switch, and the remote annunciator panel if it is included elsewhere in these specifications.

2. Shop Drawings

3. Samples

B. Informational Submittal

1. Certificates

2. Test and Evaluation Reports

3. Manufacturer's Instruction

- a. Source Quality Control Submittals
- b. Field or Site Quality Control
- c. Manufacturer's Report
- d. Special Procedure Submittal
- e. Qualification Statement

C. Closeout Submittals

1. Maintenance Contracts

2. Operation And Maintenance Data

3. Bonds

4. Warranty Documentation



5. Record Documentation
6. Software

D. Maintenance Material Submittals

1. Literature
2. Spare Parts
3. Extra Stock Materials
4. Tools

6.03 QUALITY ASSURANCE

A. Regulatory Agency

1. The automatic transfer switch shall conform to the requirements of the following codes and standards:
  - a. UL 1008 - Standard for Transfer Switch Equipment
  - b. IEC 947-6-1 Low-voltage Switchgear and Control gear; Multifunction equipment; Automatic Transfer Switching EquipmentEN55011, Limits and Methods of Measurement of Radio Interference Characteristics of Industrial, Scientific and Medical Equipment.
  - c. NFPA 70 - National Electrical Code
  - d. NFPA 99 - Essential Electrical Systems for Health Care Facilities
  - e. NFPA 110 - Emergency and Standby Power Systems
  - f. IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
  - g. NEMA Standard ICS 10-2005, Electromechanical AC Transfer Switch Equipment.
  - h. EN61000-4-4 Fast Transient Immunity Severity Level 4
  - i. EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
  - j. IEEE 472 (ANSI C37.90A) Ring Wave Test
  - k. IEC Specifications for EMI/EMC Immunity (CISPR 11, IEC 1000-4-2, IEC 1000-4-3, IEC 1000-4-4, IEC 1000-4-5, IEC 1000-4-6, IEC 1000-4-8, IEC 1000-4-11)
  - l. CSA C22.2 No. 178 certification
2. Qualifications
  - a. The automatic transfer switch shall be produced by a manufacturer who is ISO 9001 certified for the design, development, production and service of its complete product line.
  - b. A manufacturer who has produced this type of equipment for a period of at least 10 years and who maintains a service organization available twenty-four hour a day throughout the year shall produce the automatic transfer switch.
3. Manufacturers
  - a. The automatic transfer switch shall be furnished by a single manufacturer who shall be responsible for the design, coordination, and testing of the complete system. The entire system shall be installed as shown on the plans, drawings, and specifications herein.
  - b. The manufacturer shall maintain a national service organization of employing personnel located throughout the contiguous United States. The Service center's personnel must be factory trained and must be on call 24 hours a day, 365 days a year.
  - c. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years.

6.04 FIELD OR SITE CONDITIONS

A. Ambient Conditions

- I. Automatic transfer switch shall operate in the following conditions without any damage to the unit or its loads.
  - a. Ambient Temperature: -4 to 158 Degrees F
  - b. Relative Humidity: 5% to 95% noncondensing

## PART 7 - PRODUCTS

### 7.01 OWNER-FURNISHED OR OWNER-SUPPLIED

#### A. New Products

### 7.02 EQUIPMENT

#### A. Equipment

1. Furnish and install an automatic transfer switches system(s) with 4-Pole / 4-Wire, Switched Neutral, 800 Amps, 208V/60Hz. Each automatic transfer shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. All transfer switches and controllers shall be the products of the same manufacturer.

#### B. Manufacturer

1. Automatic transfer switches shall be Kohler Bypass/Isolation - Programmed Transition (KAP)/KAP-DCVC-#S. Any alternate shall be submitted for approval to the consulting engineer at least 10 days prior to bid date. Alternate bids shall include a line-by-line clarification of the specification marked with "D" for deviation; "E" for exception, and "C" for comply.

#### C. Construction

#### D. Enclosure

1. The ATS shall be furnished in a NEMA 3R enclosure.
2. All standard door mounted switches and indicating LEDs shall be integrated into a flush-mounted, interface membrane or equivalent in the enclosure door for easy viewing & replacement. The panel shall be capable of having a manual locking feature to allow the user to lockout all membrane mounted control switches to prevent unauthorized tampering. This cover shall be mounted with hinges and have a latch that may be padlocked. The membrane panel shall be suitable for mounting by others when furnished on open type units.

### 7.03 OPERATION

#### A. Operators

- I. A two-way bypass-isolation switch shall provide manual bypass of the load to either source and permit isolation of the automatic transfer switch from all source and load power conductors. All main contacts shall be manually driven.

2. Power interconnections shall be silver-plated copper bus bar. The only field installed power connections shall be at the service and load terminals of the bypass-isolation switch. All control inter-wiring shall be provided with disconnect plugs.
3. Separate bypass and isolation handles shall be utilized to provide clear distinction between the functions. Handles shall be permanently affixed and operable without opening the enclosure door. Designs requiring insertion of loose operating handles or opening of the enclosure door to operate are not acceptable.
4. Bypass to the load-carrying source shall be accomplished with no interruption of power to the load (make before break contacts). Designs which disconnect the load when bypassing are not acceptable. The bypass handle shall have three operating modes: "Bypass to Normal," "Automatic," and "Bypass to Emergency." The operating speed of the bypass contacts shall be the same as the associated transfer switch and shall be independent of the speed at which the manual handle is operated. In the "Automatic" mode, the bypass contacts shall be out of the power circuit so that they will not be subjected to fault currents to which the system may be subjected.
5. The isolation handle shall provide three operating modes: "Closed," "Test," and "Open." The "Test" mode shall permit testing of the entire emergency power system, including the automatic transfer switch with no interruption of power to the load. The "Open" mode shall completely isolate the automatic transfer switch from all source and load power conductors. When in the "Open" mode, it shall be possible to completely withdraw the automatic transfer switch for inspection or maintenance to conform to code requirements without removal of power conductors or the use of any tools.
6. When the isolation switch is in the "Test" or "Open" mode, the bypass switch shall function as a manual transfer switch.
7. Designs requiring operation of key interlocks for bypass isolation or ATS(s) which cannot be completely withdrawn when isolated are not acceptable.

B. Controls

1. A four line, 20 character LCD display and dynamic 4 button keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and control through the communications interface port or USB. The following parameters shall only be adjustable via a password protected programming on the controller:
  - a. Nominal line voltage and frequency
  - b. Single or three phase sensing
  - c. Operating parameter protection
  - d. Transfer operating mode configuration (Standard transition, Programmed transition, or Closed transition)

C. Voltage and Frequency

1. Voltage (all phases) and frequency on both the normal and emergency sources shall be continuously monitored, with the following pickup, dropout, and trip setting capabilities (values shown as % of nominal unless otherwise specified):
 

a. Parameter	Dropout/Trip	Pickup/Reset
b. Under voltage	75 to 98%	85 to 100%
c. Over voltage	106 to 135%	95 to 100% of trip
d. Under frequency	95 to 99%	80 to 95%
e. Over frequency	01 to 115%	105 to 120%
f. Voltage unbalance	5 to 20%	3 to 18%
2. Repetitive accuracy of all settings shall be within  $\pm 0.5\%$  over an operating temperature range of  $-20^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ .
3. An adjustable dropout time for transient voltage and frequency excursions shall be provided. The time delays shall be 0.1 to 9.9 seconds for voltage and .1 to 15 seconds for frequency.
4. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad, remotely via the communications interface port or USB.

5. The controller shall be capable of sensing the phase rotation of both the normal and emergency sources. The source shall be considered unacceptable if the phase rotation is not the preferred rotation selected (ABC or BAC). Unacceptable phase rotation shall be indicated on the LCD; the service required LED and the annunciation through the communication protocol and dry contacts. In addition, the phase rotation sensing shall be capable of being disabled, if required.
6. The controller shall be capable of detecting a single phasing condition of a source, even though a voltage may be regenerated by the load. This condition is a loss of phase and shall be considered a failed source.
7. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases (phase to phase and phase to neutral), frequency, and phase rotation.

D. Time Delays

7.04 SOURCE QUALITY CONTROL

A. Test and Inspection

1. Upon request, the manufacturer shall provide a notarized letter certifying compliance with all of the requirements of this specification including compliance with the above codes and standards. The certification shall identify, by serial number(s), the equipment involved. No exceptions to the specifications, other than those stipulated at the time of the submittal, shall be included in the certification.
2. The ATS manufacturer shall be certified to ISO 9001 International Quality Standard and the manufacturer shall have third party certification verifying quality assurance in design/development, production, installation and servicing in accordance with ISO 9001.

END OF SECTION

SECTION 31 10 00

EARTHWORK

PART 1 - GENERAL

1.01 CONDITIONS

- A. Requirements of the Conditions of the Contract apply to all work under this Section. This includes all labor, materials, equipment and services necessary to complete all work indicated on the drawings and herein specified, or both.
- B. Carefully read the General Conditions of the Specifications, which shall be considered as and made a part of this section.

1.02 SCOPE

- A. The work required under this section consists of all excavating, filling, grading, dewatering, and related items necessary to complete the work indicated on the Drawings and described in these Specifications, including but not necessarily limited to the following:
  - 1. Excavating and disposal of existing concrete, building and site rubble, removal of top 12" of on-site soils (stripping) and stockpile for landscaping purposes.
  - 2. Rough grading and subgrade preparation. Filling to top of subgrade with ordinary fill (locally available soil) approved by the Engineer.
  - 3. Providing and installing geofabric under all areas of fill except slabs.
  - 4. Providing and installing controlled fill materials, footings and slabs.

1.03 EXAMINATION OF SITE AND DOCUMENTS

- A. It is hereby understood that the Contractor has carefully examined the site and all conditions affecting work under this section. No claim for additional costs will be allowed because of lack of full knowledge of existing conditions as indicated in the Contract Documents, or obvious from observation at the site.
- B. Plans, surveys, measurements, and dimensions under which the work is to be performed are believed to be correct, but the Contractor shall have examined them for himself during the bidding period as no allowance will be made for any errors or inaccuracies that may be found herein.

1.04 SUBSURFACE CONDITIONS

- A. Subsurface conditions are to be assumed substantially as shown on the Drawings.

1.05 REQUIREMENTS OF REGULATORY AGENCIES

- A. All work shall conform to the Drawings and Specifications and shall comply with applicable codes and regulations.
- B. Comply with rules, regulations, laws and ordinances of all authorities having jurisdiction.
- C. The Contractor shall procure and pay for all permits and licenses required for the complete work specified herein and shown on the Drawings.

- D. The Contractor shall not close or obstruct any street, sidewalk, alley or passageway without permission from authorities having jurisdiction. The Contractor shall so conduct his operations as to interfere as little as possible with the use ordinarily made of roads, driveways, alleys, sidewalks, or other facilities near enough to the work to be affected thereby.

PART 2 - MATERIALS AND EQUIPMENT

2.01 FILL MATERIALS

- A. Gravel Fill. Well graded natural sand and gravel free from ice, organic or other deleterious materials, conforming to the following gradations:

<u>U.S. Sieve No.</u>	<u>Percent Passing by Weight</u>	
	<u>Maximum</u>	<u>Minimum</u>
4 Inch	---	100
1 Inch	100	60
No. 4	85	25
No. 40	35	5
No. 200	5	0

- B. Ordinary Fill. Well-graded, natural, inorganic soil shall consist of sand or gravel clays approved by the Architect/Engineer and meeting the following requirements:
1. It shall be free of organic and other weak or compressive materials, of frozen materials, and of stones larger than 6 inches maximum dimension.
  2. It shall be of such nature and character that it can be compacted to the specified density of 100% Standard Proctor in a reasonable length of time.
  3. It shall be free of highly plastic clays, of all materials subject to decay, decomposition, or dissolution, and of cinders or other materials which will corrode piping or other materials.
  4. It shall have a plasticity index (PI) of less than 15.
  5. Ordinary fill shall be used to fill to the top of subgrade.
- C. Controlled Fill/Base Material Under Footings Slabs, Paved (both Rigid and Flexible) Driveways and Parking Areas.
1. The controlled fill under the floor slabs and footings shall consist of clayey sand or clayey gravel with a plasticity index less than 15. Samples of materials proposed shall be submitted for approval.
- D. Granular Material Under Concrete Slabs.
1. The granular material under floor slabs shall consist of porous sands or crushed fine limestone with no more than 5% passing a No. 200 sieve (absence of fines), as approved by the Engineer.
- E. Topsoil. Fertile, friable, natural topsoil of loamy character, without admixture of subsoil material, obtained from a well-drained arable site, reasonably free from clay, lumps, coarse sands, stones, plants, roots, sticks, brick and other foreign materials, with acidity range of between pH 6.0 and 6.8. Disturbed areas to be seeded shall receive a 3" minimum of approved topsoil. Areas that shall receive beds and sod shall receive a 3" minimum layer of approved topsoil.

1. Identify source location of topsoil proposed for use on the project.
2. Provide topsoil free of substances harmful to the plants, which will be grown in the soil.

## 2.02 SOURCE QUALITY CONTROL

- A. All fill materials shall be subject to quality control testing. A qualified laboratory will be selected and paid by the Contractor to perform tests on materials. Test results and laboratory recommendations will be available to the Owner.

## 2.03 COMPACTION EQUIPMENT

- A. Provide sufficient equipment units of suitable types to spread, level and compact fills promptly upon delivery of materials.
- B. Contractor may use any compaction equipment or device which he finds convenient and economical, but the Architect/ Engineer retains the right to disapprove equipment which, in his opinion, is of inadequate capacity or unsuited to the character of materials being compacted.

## PART 3 - EXECUTION

### 3.01 GENERAL

- A. Site Preparation
  1. To prepare for construction, all topsoil, vegetation, roots, and any soft soils in the building or pavement areas shall be stripped from the ground surface and either wasted or stockpiled for later use in landscaping. Some old foundation slabs may be encountered.
  2. Site grading should include removal of the surficial organic soil zone in the building and pavement areas. Depth of stripping is estimated to be on the order of 12 inches, although potentially greater in localized soft and/or moist areas during wetter seasons.
  3. Following stripping, and prior to placing fill, the site should be proof-rolled with a minimum 20,000 pound pneumatic tired roller, loaded tandem-wheeled dump truck, or similar equipment. Soft or loose zones should be undercut and be processed and re-compacted or undercut and replaced with approved select fill. Additional undercutting in excess of the 12 inches will be considered a part of "site work" in the lump sum bid schedule and no additional compensation will be made.
  4. Subgrade shall be compacted to 98% Standard Proctor. A subgrade support fabric such as Mirafi 500x (or equal) shall be placed between the compacted fill and the natural ground to improve site stability of soils.
  5. Undercutting to depths of 3 to 4 feet are possible under extremely wet conditions, or if excessive disturbance occurs due to heavy construction equipment. To reduce undercut potential, the use of light dozers is recommended for stripping. In addition, operation of heavy rubber-tired equipment should be limited. See Soils Report, Appendix A.
  6. Fill required for backfill or to raise existing grade should consist of select clayey sand (SC), sandy clay (CL), or clayey gravel (GC) having a liquid limit less than 40, or an approved alternate. Since the footings will be supported in fill, a compaction criteria of at least 100 percent of Standard Proctor dry density (ASTM D-1557) with a moisture content range of -2 to +3 percent of optimum is recommended. In pavement areas, a compaction criteria of at least 100 percent of maximum Standard Proctor dry density (ASTM D-698) for base course, at a moisture content near optimum is recommended. Fill should be placed in maximum 8

inch lifts. Each lift or fill should be properly compacted, tested, and approved prior to placing subsequent lifts.

B. Layout and Grades

1. All lines and grade work not presently established at the site shall be laid out by the Contractor in accordance with the Contract Drawings and Specifications. The Contractor shall establish permanent bench marks determined by a Registered Land Surveyor Professional Civil Engineer. Maintain all established bounds and bench marks and replace as directed any which are destroyed or disturbed.
2. The words "finished grades" as used herein shall mean the required final grade elevations indicated on the Drawings. Spot elevations shall govern over proposed contours. Where not otherwise indicated, project site areas outside of the buildings shall be given uniform slopes between points for which finished grades are indicated or between such points and existing established grades.
3. The word "subgrade" as used herein means the required surface of subsoil, ordinary fill or compacted fill. The surface is immediately beneath the site improvements, specially dimensioned fill, paving, loaming, or other surfacing materials.

C. Disposition of Existing Utilities

1. Active utilities existing on the site shall be carefully protected from damage and relocated or removed as required by the work. When an active utility line is exposed during construction, its location and elevation shall be plotted on the record drawings and both the Architect/Engineer and the utility owner notified in writing.
2. Inactive or abandoned utilities encountered during construction operations shall be removed, plugged or capped. The location of such utilities shall be noted on the record drawings and reported in writing to the Architect/Engineer.

D. Frost Protection

1. Make no excavations to the full depth indicated when freezing temperatures may be expected, unless the footings or slabs can be placed immediately after the excavation has been completed. Protect the bottom so excavated from frost if placing of concrete is delayed. Should protection fail, remove frozen materials and replace with gravel fill as directed, at no cost to the Owner.
2. The underside of in-place beams and slabs shall be protected from freezing temperatures.

E. Disposal

1. All excavated materials which are not used for fill or backfill, and all surplus excavated materials shall be removed from the site and disposed of at no cost to the Owner.

### 3.02 EXCAVATION

- A. Excavate all materials as required to allow construction of the foundations for the structure as shown on the Drawings. Attention is called to "General Notes" on Structural Drawings and to the requirements contained therein which may affect the work under this section.
- B. If rock is encountered, trenches shall be excavated to 6 inches below bottom of pipe. Trenches for storm and sanitary sewers shall have a continuous slope in the direction of flow.



- C. When the depth of backfill over the pipes exceeds ten (10) feet, keep the trench below the level of the top of the pipe as narrow as practicable.

### 3.03 DEWATERING

- A. Provide, maintain and operate pumps and related equipment, including standby equipment, of sufficient capacity to keep excavation free of all water at all times and under any and all contingencies that may arise until the structures attain their full strength.

### 3.04 PLACING FILLS

#### A. General

1. Areas to be filled or backfilled shall be free of construction debris, refuse, compressible or decayable materials and standing water. Do not place when fill materials or layers below it are frozen.
2. Notify the Architect/Engineer when excavations are ready for inspection. Filling and backfilling shall not be started until conditions have been approved by the Architect/Engineer.
3. Furnish approved materials. Place fill in layers not exceeding 6 inches compacted thickness and compact as specified below for various fill conditions.
4. Before backfilling against walls, the permanent structures (including basement floor slabs) shall be cast and sufficiently aged to attain strength required to resist backfill pressures without damage. Temporary bracing will not be permitted except by written permission from the Architect/Engineer. When filling on both sides of a wall or pier, place fill simultaneously on each side. Correct any damage to the structure caused by backfilling operations at no cost to Owner. Place no stones closer than eighteen (18) inches to wall surfaces.
5. Backfill trenches only after pipe has been inspected, tested, and location of pipes and appurtenances have been recorded.
6. Pipe bed shall be shaped by means of hand shovels to give full and continuous support to lower third of pipe. Backfill by hand around pipe and for a depth of twelve (12) inches above the pipe; use sand and tamp firmly in layers not exceeding six (6) inches in thickness, taking care not to disturb the pipe. Compact the remainder of the backfill thoroughly with a rammer of suitable weight or with an approved mechanical tamper to achieve the compaction specified below for various fill conditions.
7. Where soft materials of poor bearing qualities are found in trenching, a concrete foundation may be required to insure a firm foundation for the pipe. Such concrete foundation shall be bedded with six (6) inches of sand tamped in place so as to provide a uniform bearing for the pipe between joints.
8. All exposed subgrade shall be proof-rolled prior to fill placement to aid in identifying areas of loose or soft subgrade soils. Random compaction tests shall be performed to verify a subgrade soil compaction of 98% Standard Proctor of the top 6" of subgrade soil prior to ordinary fill or base course fill placement.

#### B. Placing Ordinary Fill

1. Ordinary fill as specified in Paragraph 2.1.B. hereinabove shall be provided behind all walls and for all backfill and fill where gravel fill has not been specified hereinabove or on Drawings.
2. Place ordinary fill in lifts not exceeding eight (8) inches, uncompacted thickness, and compact to 100% standard proctor density (ASTM D-698).

#### C. Placing Controlled Fill

1. The controlled fill should be scarified and then processed to a moisture content between three percentage points below and two percentage points above the Standard Proctor optimum. The subgrade

soils should be recompacted to a dry density of at least 98% of the standard Proctor maximum dry density for depths of at least 6 inches below the surface.

2. After subgrade preparation and inspection have been completed, fill placement may begin. Fill materials should be free of organic or other deleterious materials, have a maximum particle size of 3 inches, and have a plasticity index of less than 15. If a fine-grained (silt or clay) soil is used for fill, very close moisture content control will be required to achieve the recommended degree of compaction.
3. Fine-grained and granular structural fill should be compacted to at least 100% of the maximum Standard Proctor dry density as determined by ASTM Designation D-698. The fills under the concrete pavements shall have some plasticity. Select clayey sand or clayey gravel with a plasticity index between 4 and 15 shall be used.
4. Fill should be placed in maximum lifts of eight inches of loose material and should be compacted within the range of two percentage points above to three percentage points below the optimum moisture content as determined by the standard Proctor test. If water must be added, it should be uniformly applied and mixed into the soil by disk or scarifying.
5. Each lift of compacted soil should be tested and approved by the soils Architect/ Engineer or his representative prior to placement of subsequent lifts. As a guideline, it is recommended that field density tests be taken at a frequency of not less than one test per 2500 square feet of surface area per lift of fill in the building areas. This testing frequency may be reduced to one test per 5000 square feet of surface area per lift of fill in the pavement areas.

I D. Field Quality Control

1. Cooperate with laboratory in obtaining field samples of in-place materials after compaction. Furnish identical field labor in connection with these tests.

E. Construction Procedures

1. It is anticipated that the surficial silty clay soils encountered over portions of the site may be subject to significant loss in shear strength upon exposure and saturation. Therefore, adequate drainage of surface runoff should be established during the early phases of site grading and continued throughout construction to prevent ponding and subsequent saturation of subgrade soils.
2. It is anticipated that if construction is initiated during wetter seasons limited perched ground water may be encountered above excavation depths. Further, if the silty clay surficial soils within the building area are near saturation, pumping of these soils may occur during fill placement, requiring additional undercutting or the use of a "bridge" lift procedure. The potential for these problems to occur is considered to be significantly reduced if the site is dry.
3. Foundation excavations should be free of all loose or soft soils and water prior to placing concrete. Concrete should be placed as soon as possible after excavation, cleaning and inspection are complete to minimize possible changes in soil conditions due to the effects of wetting and drying. The Contractor shall notify the Architect/Engineer so he can be present during foundation excavation to monitor soil conditions at foundation depths.
4. Care should be taken to adequately slope or brace the sides of foundation excavations to prevent sloughing or caving. All applicable safety requirements (OSHA) regarding trench excavations should be adhered to.

3.05 CLEAN UP

- A. Remove all excess earth, debris, topsoil or other materials associated with this work from the job site.
- B. Keep driveways and city streets free from mud or trash deposited by equipment used in performing work under this section.

END OF SECTION

SECTION 32 01 13.62

ASPHALT PAVEMENT SEALCOATING FOR PARKING LOTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Asphalt Pavement Sealcoating

1.02 REFERENCE STANDARDS

- A. American Society for Testing Materials (ASTM)

1. D 2939-03 Standard Test Methods for Emulsified Bitumens Used as Protective Coatings
2. The following ASTM test methods: D140, D466, D529, D244, C88, C131, C117, C127, C123, D1310, D2170, D95, D402, D2171, D5, D113, D2042, D711, D969, D1475, D3960, D2486, E70, D562, D3583, D3236, D5249, D6690, B117, D977
3. Polymer Modified MasterSeal meets ASTM D8099/D8099M-17 Standard Specification for Asphalt Emulsion Pavement Sealer and FAA Item P-623 Specification for Emulsified Asphalt Spray Sealcoat.

- B. Federal Specifications for Waterborne Traffic and Airfield Marking Paints

1. TT-P-1952E Types I, II, and III
2. TT-P-1952D
3. TT-P-1952B

1.03 SUBMITTALS

- A. Product Data

1. Submit manufacturer's Product Data Sheet.

1.04 PROJECT/SITE CONDITIONS

- A. Ambient Conditions

1. Both surface and ambient temperature must be a minimum of 50°F and rising before applying cold applied crack fillers, oil spot primers, pavement sealers or traffic paints (materials). Ambient and surface temperature shall not drop below 50°F for a 24 hour period following application of materials.
2. Apply materials during dry conditions when rain is not imminent or forecast for at least 24 hours after application.

- B. Pavement/Surface Conditions

1. Newly placed (paved) asphalt pavement surfaces should be allowed to cure a minimum of four (4) weeks under ideal weather conditions (70°F) before applying coatings.
2. New pavement surfaces shall be free of residual oils or chemicals associated with the placement of new asphalt pavement.
3. Aged pavement surfaces shall be cleaned and prepared as recommended in this specification under PART 3 Sections 3.1 thru 3.7 of this specification.

## PART 2 - PRODUCTS

### 2.01 MANUFACTURER

- A. SealMaster Pavement Products and Equipment or equal.

### 2.02 MATERIALS

- A. SealMaster Petro Seal Oil Spot Primer (Concentrate).

1. Acrylic co-polymer latex emulsion
2. Seals oil spots prior sealcoating
3. Helps prevent oil spots from “bleeding through” freshly applied sealer
4. Mix on-site with water prior to application
5. Apply by brush or spray to properly cleaned oil spot
6. Non-volatiles (%): 27% Min.
7. Specific Gravity: 1.04
8. Color: Dries translucent to clear

- B. SealMaster CrackMaster Parking Lot Grade (Hot Pour Rubberized Crack Sealant)

1. Premium Rubberized Asphalt hot pour crack sealant
2. Designed for filling and sealing cracks up to 1” wide in asphalt or concrete pavement
3. Provides a protective barrier against moisture intrusion into cracks
4. Designed to be melted in oil-jacketed kettles or direct-fire kettles with agitation
5. Recommended pour temperature: 370-390°F
6. Penetration (150 gr/5 sec.): 35 Max.
7. Resiliency: 60%
8. Flow at 140°F: 0 mm
9. Softening Point: 200°F Min
10. Viscosity @ 375°F: 25 ± 10 poise
11. Specific gravity: 1.15 Min.

- C. SealMaster Polymer Modified MasterSeal

1. Polymer modified, clay-stabilized, mineral filled asphalt emulsion sealcoat
2. Designed for protecting, renewing and beautifying asphalt pavement surfaces
3. Protects pavement against weather, UV rays, and environmental distress
4. Designed to mixed on-site with silica sand or other approved aggregate
5. Applied to properly cleaned asphalt surface by spray, brush or squeegee
6. Non-volatiles (%): 43% Min.
7. Ash content of non-volatiles (%): 42% Min.
8. Specific Gravity @ 25°F: 1.12 Min.
9. Drying Time: 8 hours Max.
10. Adhesion & resistance to water: No penetration or loss of adhesion
11. Resistance to heat: No blistering or sagging
12. Flexibility: No cracking or flaking
13. Resistance to impact: No chipping, Flaking or Cracking

- D. SealMaster TTP-1952B Traffic Paint (White and Yellow)

1. 100 % Acrylic Water-based Traffic Paint
2. Meets Federal Specification TT-P- 1952B
3. Apply with standard cold-applied traffic marking spray equipment
4. Do not dilute.

5. Volatile Organic Content (VOC): <50g/l
6. Viscosity (KU): 70-110 KU
7. Solids by Weight (%): 60% Min.
8. Scrub Resistance: 1,000 cycles Min.
9. Dry Opacity: .965
10. Directional Reflectance (%): White 86%; Yellow 50%
11. Drying Time for no Pick-up, minutes: <30 minutes

E. SealMaster Handicap Blue Traffic Paint

1. 100 % Acrylic Water-based Traffic Paint for Handicap markings on pavement
2. Apply with standard cold-applied traffic marking spray equipment, brush or roller
3. Do not dilute
4. Volatile Organic Content (VOC): <50g/l
5. Viscosity (KU): 70-110 KU
6. Solids by Weight (%): 50% Min.
7. Scrub Resistance: 1,000 Cycles Min.
8. Drying Time for no Pick-up, minutes: <30 minutes

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine pavement surface prior to performing work
- B. Notify project engineer of any adverse or unacceptable conditions that would affect successful repair efforts or application of materials
- C. Do not commence work until unacceptable conditions are corrected

3.02 SURFACE PREPARATION

- A. Surface must be clean and free from all loose material and dirt. Remove grass along edge of pavement to find true edge of pavement.

3.03 CRACK REPAIR

- A. Hot Applied Crack Sealant/Filling Materials and Methods
  1. Cracks must be free from dust, dirt, vegetation and moisture. Clean cracks with mechanical wire brush followed by a compressed air heat lance to remove loose debris and moisture.
  2. For all cracks up to 1" wide apply either SealMaster CrackMaster Parking Lot Grade crack sealant or SealMaster Crackmaster Supreme crack sealant.
  3. SealMaster CrackMaster Parking Lot Grade crack sealant shall be melted in a conventional oil-jacketed unit equipped with an agitator.
  4. Apply heated CrackMaster Parking Lot Grade crack sealant using a pump and wand system, a crack banding unit or a pour pot.
  5. Contractor or other Entity Responsible for performing work shall refer to Manufacturer's Product Data Sheet for more detailed application instructions for CrackMaster Parking Lot Grade Crack Sealant.

3.04 OIL SPOT PRIMING

- A. Prime Oil Spots with SealMaster Prep Seal or SealMaster Petro Seal

1. Wipe or scrape excessive build-up of oil, grease, and gasoline spots. A torch may be used to burn away any residual.
2. Apply oil spot primer with brush, roller or sprayer.
3. Allow to dry before sealcoating.
4. Contractor or other Entity Responsible for performing work shall refer to Manufacturer's Product Data Sheet for more detailed application instructions for SealMaster Prep Seal or SealMaster Petro Seal.

3.05 POLYMER-MODIFIED MASTERSEAL (PMM) APPLICATION

A. Applying SealMaster Polymer-Modified MasterSeal

1. Remove all loose material and dirt from pavement surface. Remove grass along edge of pavement to find true edge of pavement. Power blowers, mechanical sweeping devices and push brooms are acceptable cleaning methods.
2. Equipment used to apply Polymer-Modified MasterSeal shall have continuous agitation or mixing capabilities to maintain homogeneous consistency of pavement sealer mixture throughout the application process. Spray equipment shall be capable of mixing and spraying pavement sealer with sand added. Self-propelled squeegee equipment with mixing capability shall have at least 2 squeegee or brush devices (one behind the other) to assure adequate distribution and penetration of sealer into pavement surface. Hand squeegees and brushes shall be acceptable in areas where practicality prohibits the use of mechanized equipment.
3. Polymer-Modified MasterSeal (PMM) shall be mixed in accordance with the following mix design (based on 100 gallons of PMM for ease of calculation):
  - Polymer-Modified MasterSeal (PMM).....100 gallons
  - Sand (40 to 70 mesh AFS fineness gradation).....200-400 lbs.

Note: If required, a small amount of water may be added to facilitate application of mixed material.
4. Apply two coats of mixed PMM and Sand at a rate of .11 to .13 gallon per square yard per coat to entire pavement area. Allow first coat to dry thoroughly before applying second coat.
5. Apply a third coat of mixed PMM and Sand at a rate of .11 to .13 gallon per square yard to high traffic areas including parking area entrances, exits and drive lanes (or as specified in additional diagrams or drawings). Allow second coat to dry thoroughly before applying a third coat to these areas.
6. Allow final coat of pavement sealer to dry 24 hours prior to applying SealMaster 100 % Acrylic Water based Traffic Paint.

3.06 TRAFFIC MARKINGS/LINE STRIPING

A. Applying SealMaster Traffic Paint

1. Remove all loose material and dirt from existing pavement. Freshly applied pavement sealer shall be allowed to cure for a minimum of 24 hours prior to applying Traffic paint.
2. Apply SealMaster Traffic Paint with pressurized line striping spray equipment at wet thickness of 15 to 20 mils.
3. Apply SealMaster Handicap Blue to all handicap parking spots.
4. Allow paint to dry thoroughly prior to opening to traffic.

END OF SECTION

SECTION 32 11 23

AGGREGATE BASE COURSE

PART 1 - GENERAL PROVISIONS

1.01 DESCRIPTION

- A. This work shall include the installation of aggregate base course.

PART 2 - MATERIALS

2.01 BASE COURSE

- A. Crushed Stone Base. This material shall consist of crushed run stone or a mixture of crushed stone and natural fines uniformly mixed and so proportioned as to meet all the requirements hereinafter specified, with the further provision that a mixture of crushed stone and natural fines shall contain not less than 90 percent crusher produced material. The stone shall be hard and durable with a percent of wear of 45 by Los Angeles Test (AASHTO T 96). For the purpose of this specification, shale and slate are not considered to be stone. The material furnished shall not contain more than 5 percent by weight of shale, slate and other deleterious matter.

The class or classes of crushed stone base course material that may be used on any particular job will be those called for on the proposed schedule.

GRADING REQUIREMENTS

Size of Sieve	Percent by Weight	
	Class <u>SB-2</u>	Class <u>SB-3</u>
1-1/2"	0	--
1"	--	0
3/4"	10-50	0-35
No. 4	50-75	50-75
<u>Total Passing</u>		
No. 40	10-30	10-30
No. 200	3-10	3-10

The fraction passing the No. 200 sieve shall not be greater than two-thirds the fraction passing the No. 40 sieve. The fraction passing the No. 40 sieve shall have a liquid limit not greater than 25 and a plasticity index of not greater than 6.

When it is necessary to blend two or more materials, each material shall be proportioned separately through mechanical feeders to insure uniform production. Premixing or blending in the pit to avoid separate feeding will not be permitted. Blending materials on the roadway in order to obtain a mixture that will comply with the above requirements will not be permitted.

PART 3 - APPLICATION

3.01 APPLICATION

- A. Crushed Stone Base Construction. The base course material shall be placed on a completed and approved subgrade or existing base that has been bladed to conform to the grade and cross section shown on the plans.

The subgrade shall be prepared as specified and shall be free from an excess or deficiency of moisture at the time of placing the base course. The subgrade shall also comply, where applicable, with the requirements of other items that may be contained in the contract that provide for construction, reconstruction or shaping of the subgrade or the reconstruction of the existing base course.

Base course material shall not be placed on a frozen subgrade or subbase.

The crushed stone gravel shall be placed on the subgrade or other base course material and spread uniformly to such depth and lines that when compacted it will have the thickness, width and cross-section shown on the plans.

If required, the compacted depth of the base course exceeds six inches (6"), the base shall be constructed in two or more layers of approximate equal thickness. The maximum compacted thickness of any one layer shall not exceed six (6) inches. When vibrating or other approved type of special compacting equipment is used, the compacted depth of a single layer of the base course may be increased to 8 inches upon approval.

The spreading shall be done the same day that the material is hauled and it shall be performed in such manner that no segregation of coarse particles or nests or hard areas caused by dumping the gravel on the subgrade will exist. To insure proper mixing, the gravel shall be bladed entirely across the roadbed before being spread. Care must be taken to prevent mixing of subgrade or shoulder material with base course material in the blading and spreading operation.

Each course shall be compacted by any satisfactory method that will produce the density hereinafter specified. The gravel shall be substantially maintained at optimum moisture during the mixing, spreading, and compacting operations. The density of the compacted material in each course, as determined by AASHTO T-191, shall not be less than 95 percent of the density obtained in the laboratory by AASHTO T-180. The crushed stone shall be compacted across the entire width of application.

The laboratory density shall be obtained as follows. The sample is prepared by removing the aggregate retained at the 3/4 inch sieve and adding aggregate passing the 3/4 inch sieve and retained on the No. 4 sieve in an amount equal to that removed. The sample so prepared is compacted at various water contents in five equal layers in a mold 6 inches in diameter and 7 inches in height. Each layer is compacted by 55 blows of a 10 pound hammer 2 inches in diameter dropped from a height of 18 inches. The density used is the dry weight obtained at the optimum water content.

The compacted base course shall be tested for depth and any deficiencies corrected by scarifying, placing additional material, mixing, reshaping, and recompacting to specified density, as directed.

The Contractor shall maintain the base course in a satisfactory condition until accepted.

END SECTION



SECTION 32 13 13

PORTLAND CEMENT CONCRETE PAVING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This shall consist of portland cement concrete constructed in one course on the prepared subgrade or on a completed and accepted base course in accordance with these specifications and in conformity with the lines, grades, thickness, and typical cross section shown on the plans.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Concrete. Concrete shall meet the requirements of Section 501 for Portland Cement Concrete Pavement, or Section 802 for Class A or S Concrete of the AHTD Standard Specifications for Highway Construction. When the Contractor elects to use concrete meeting the requirements of Section 501, the maximum allowable slump shall be 4 inches. The specified maximum water-cement ratio shall not be exceeded. Class S (3500 psi) concrete shall be used for all miscellaneous structures.
- B. Joint Filler. Materials for joint filler shall meet requirements of AASHTO M 213.
- C. Curing Materials. Curing materials shall meet the requirements of subsection 501.03(i).

PART 3 - EXECUTION

3.01 DURABILITY REQUIREMENTS

- A. The concrete slab shall meet the requirements of Table 1603 A and 1603 C for moderate exposure as required by the AFPC volume 2.
- B. Curing. Curing shall be in conformance with Section 501(1), of AHTD standard specifications.
- C. Construction Requirements, The methods employed in performing the work shall conform to the requirements as specified in subsection 501.04. Transverse expansion joints shall be placed at 15' intervals or as directed by the Engineer.

END OF SECTION

SECTION 32 13 14

CONCRETE CURB & GUTTER

PART 1 - GENERAL

1.01 DESCRIPTION

- A. This section shall consist of the construction of Concrete Curb and Gutter at the locations shown on the Plans or as directed by the Engineer.

1.02 STANDARD SPECIFICATIONS

- A. Materials and work for Concrete Curb and Gutter shall be in accordance with SECTION 634 - CURBING of the AHTD Standard Specifications.

PART 2 - PRODUCTS

2.01 FORMS

- A. Article 634.03(b) of AHTD Standard Specifications shall be augmented as follows:
  - 1. The work shall be performed with a mechanical slip-form paver.

PART 3 - EXECUTION

3.01 PLACING AND FINISHING

- A. That part of Article 634.03(c)(1) of AHTD Standard Specifications which relates to placing and finishing shall be replaced by the following requirements:
  - 1. Concrete shall be dry enough to permit use of slip-form paver; it shall not be so dry but what adequate tamping and spading will ensure adequate compaction and surfaces free from honeycomb. The subgrade shall be wetted before placing the concrete.
  - 2. The surface shall be shaped to the required section, finished with a steel trowel, and lightly brushed to produce a uniform surface of slightly roughened texture. The exposed edge of the gutter at the front form, and the exposed edge of the curb at the back form, shall be edged with an edging tool having a radius of approximately 1/8 inch.
  - 3. If templates are used to control shape, they shall be of metal.

3.02 JOINTS

- A. Article 634.03(d), Joints, AHTD Standard Specifications, for Concrete Curb and Concrete Curb and Gutter shall be deleted in its entirety, and substituted therefore shall be the following:
  - 1. Premolded expansion joint material shall be placed between the curb and gutter and any concrete construction that otherwise would abut against it. Joint material shall be 1/2 inch thick. Premolded joint material shall be of the non-extruding type, and shall conform to AASHTO designation M 213.
  - 2. Expansion joints shall be constructed at the ends of curb and gutter, at the points of curvature of returns to streets and driveways. Intermediate expansion joints shall be constructed so that the maximum distance between joints is forty (40) feet. The joint material shall extend entirely

through the curb and gutter section and, before the joint can be considered completed, must be trimmed to curb and gutter section.

3. Contraction joints shall be 1/8" to 3/8" x 1-1/2" and shall be placed at ten (10) foot intervals between expansion joints. Contraction joints shall be formed by sawing, unless otherwise specified, and sealed.
4. Joints shall be normal to the grade for gutter and the centerline of the roadway. Where curb and gutter is constructed adjacent to rigid pavement, the location and width of joints shall coincide with those in the pavement, where practicable. All joints shall be sealed with material meeting the requirements of SECTION 501 - PORTLAND CEMENT CONCRETE PAVEMENT, Article 501.03(h) of the AHTD Standard Specifications.

### 3.03 PLACEMENT

- A. Concrete Curb and Concrete Curb and Gutter shall be one-course, monolithic, between expansion joints.

END OF SECTION



SECTION 32 02 13

SEEDING & MULCHING

PART 1 - GENERAL

- 1.01 This item shall consist of furnishing and applying lime, fertilizer, seed, mulch cover, asphalt and water in accordance with these specifications at locations shown on the plans or as needed. The work under this item shall be accomplished as soon as practicable after the grading in an area has been completed in order to deter erosion.

PART 2 - MATERIALS

2.01 MATERIALS:

- A. Lime shall be agricultural grade ground limestone or equivalent,
- B. Fertilizer shall be a commercial grade, uniform in composition, free flowing, and suitable for application with mechanical equipment. It shall be delivered to the site in labeled containers conforming to current Arkansas fertilizer laws and bearing the name, trademark, and warranty of the producer.
- C. Except as modified herein, the seed shall comply with the current rules and regulations of the Arkansas State Plant Board and the germination test shall be valid on the date the seed is used. It shall have a minimum of 98% pure seed and 85% germination by weight, and shall contain no more than 1% weed seeds. A combined total of 50 noxious weed seeds shall be the maximum amount allowed per pound of seed with the following exceptions: Johnson grass seed, wild onion seed, wild garlic seed, field bindweed seed, or nut grass seed will not be allowed in any amount. Seed shall be furnished in sealed, standard containers. Seed which has become wet, moldy, or otherwise damaged in transit or in storage will not be acceptable.

Legumes shall be inoculated with an approved culture as recommended by the manufacturer, just prior to seeding. Fescue seed shall be certified endophyte free.

Seed shall be composed of the varieties and amounts by weight as shown below.

Seed planted between June 16 and August 31 may require more water than that specified in subsection 620.03 (f) in order to survive. Therefore, watering will continue after germination until growth is established.

- D. Mulch cover shall consist of straw from threshed rice, oats, wheat, barley, or rye; of wood excelsior; or of hay obtained from various legumes or grasses, such as lespedeza, clover, vetch, soybeans, bermuda, carpet sedge, bahia, fescue, or other legumes or grasses; or a combination thereof. Mulch shall be dry and reasonably free Johnson grass or other noxious weeds, and shall not be excessively brittle or in an advanced state of decomposition. All material will be inspected and approved prior to use.

Seed Variety:	Lbs./Acre
March 15 - June 15	
Bermuda Grass (common) unhulled	10
Bermuda Grass (common) hulled	5
Lespedeza (Korean)	30
June 16 - August 31	
Bermuda Grass (common) unhulled	10
Bermuda Grass (common) hulled	5
Weeping Love Grass (Eragrostis Curvula)	10
September 1 - October 31	
Rye Grass (Annual)	50
Crimson Clover (Dixie)	20
Bermuda Grass (common) unhulled	15

- A. Asphalt in mulch cover shall be such quality that the mulch cover will be bound together to form a cover mat that will stay intact under normal climatic conditions. The quality and performance of the asphalt will be determined and certified by the Engineer.
- Other materials that will function equivalent to asphalt as a tackifier for mulch cover will be permitted as a substitute for asphalt subject to the approval of the Engineer.
- B. Water shall be of irrigation quality and free of impurities that would be detrimental to plant growth.

### PART 3 - CONSTRUCTION REQUIREMENTS

#### 3.01 CONSTRUCTION REQUIREMENTS:

- A. Seedbed Preparation. Areas to be seeded shall be dressed to the shape and section shown on the plans. If the plans call for replacing topsoil, this shall be done prior to any preparations for seeding. Before beginning the seedbed preparation, soil samples shall be obtained from each major soil area for lime and fertilizer requirements analysis.
- Lime, at the rate determined by the lime requirements test, shall be uniformly spread on areas to be seeded prior to their being roughened or scarified. The seedbed shall be thoroughly pulverized by means of disk harrows or other approved methods, thoroughly mixing lime and soil to a depth of not less than 4" (2" for slopes 4:1 or steeper) below finish slope elevation. Regardless of pulverizing method used, the soil shall be broken with the contour of the slope. Objectionable foreign matter shall be removed and the soil left in a suitable horticultural condition to receive the fertilizer and seed. Water may be applied before, during, and after seedbed preparation, as directed by the Engineer, in order to maintain the desired moisture content in the soil.
- When no lime is required, seedbed preparation shall be accomplished as specified above regardless of the method used in the distribution of fertilizer, seed, and mulch cover.
- B. Fertilization. If soil test show fertilizer is needed, fertilizer shall be applied at the rate of 800 pounds per acre of 10-20-10, or the equivalent amount of plant food. Fertilizer shall be uniformly incorporated into the soil alone or in conjunction with the required lime. If the contractor so elects, the fertilizer may be drilled into the soil or combined with the seed in the hydro-seeding operation.

C. Seeding.

1. Broadcasting. Broadcast sowing may be accomplished by hand seeders or by approved power equipment. Either method shall result in uniform distribution and no work shall be performed during high winds. The area seeded shall be lightly firmed with a cultipacker immediately after broadcasting.
2. Drilled in Rows. When seed is drilled in rows, the rows shall be horizontal (parallel to contour lines). Fertilizer and seed shall not be drilled together and shall not be mixed.
3. Hydro-seeding. If a hydro-seeder is used for seeding, fertilizer and seed may be incorporated into one operation but a maximum of 800 pounds of fertilizer shall be permitted for each 1500 gallons of water. If the owner so elects, the fertilizer may be applied during preparations of the seedbed. The area shall be lightly firmed with a cultipacker immediately prior to hydro-seeding.

D, Mulch Cover. Mulch cover shall be applied at the rate of 4000 pounds per acre immediately after seeding and shall be spread uniformly over the entire area. If this method is used, no change in application rates will be allowed. In its final position, the asphalt tacked mulch shall loose enough to allow air to circulate, but compact enough to partially shade the ground and reduce the impact of rainfall on the surface of the soil. Care shall be taken to prevent asphalt materials from discoloring or marking structures, pavements, utilities, or other plant growth.

E. Asphalt. Immediately following or during the application of the mulch cover on seeded areas, asphalt shall be applied at the rate of approximately 0.05 gallon per square yard. Application shall be made from a pressure distributor, so equipped to insure constant and uniform distribution. The use of asphalt may be reduced or eliminated at selected locations when directed by the Engineer.

F. Water. After application of the mulch cover, water shall be applied in sufficient quality, to thoroughly moisten the soil to the depth of pulverization and then as necessary to germinate the seed.

The owner shall apply water in an amount such that, in conjunction with any rainfall, the seeded and mulched areas will receive an amount equivalent to a minimum of 1" of water each week beginning the week after seeding and continuing for a minimum of three (3) weeks. One inch of water is equivalent to 26,136 gallons per acre.

END OF SECTION

