

**TOPEKA AND SHAWNEE COUNTY
PUBLIC LIBRARY**
1515 SW 10th Ave
Topeka, KS 66604

Topeka and Shawnee County Public Library Room 123 Remodel

Project Manual
Project No. 2001.01-020

June 5, 2026

HTK 
ARCHITECTS

PROJECT MANUAL

Project No. 2001.01-020
June 5, 2026

PROJECT

Topeka and Shawnee County Public Library
Room 123 Remodel

OWNER

Topeka and Shawnee County Public Library
1515 SW 10th Ave
Topeka, KS 66604
785-580-4400

ARCHITECT

HTK Architects, Inc.
900 S Kansas Ave, Suite 200
Topeka, KS 66612
785-266-5373

MECHANICAL, ELECTRICAL, PLUMBING ENGINEER

Latimer Sommers & Associates, PA
3639 SW Summerfield Drive, Suite A
Topeka, KS 66614
785-233-3232

ARCHITECT'S PROFESSIONAL SEAL

The drawings, specifications, and other documents referenced in the enclosed Table of Contents for this project (identified in the header above) have been prepared by or under the direct supervision of the following licensed architect(s), with the exception of Divisions 21-28 specifications and the drawings identified as "Mechanical", "Plumbing" or "Electrical". Those documents pertain directly to the work of the consultants involved with this project, who will separately identify and seal the work for which they are responsible.



MECHANICAL & ELECTRICAL ENGINEER'S PROFESSIONAL SEAL



6-5-26

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INVITATION TO BID (Request for Proposal)

June 5, 2026

PROJECT

Room 123 Remodel – 1515 SW 10th Street Topeka, KS 66604

PROJECT DESCRIPTION

The Topeka and Shawnee County Public Library is a 21st-century, landmark library; most recently named the *Library Journal's* 2016 Library of the Year in the U.S. and Canada. The Library features the Alice C. Sabatini Gallery, the Millennium Café, Chandler Booktique (used bookstore), free meeting rooms, computer training and Internet access. Located in the heart of Shawnee County, the Library has a collection of more than 450,000 items and serves nearly 82,000 registered borrowers. About 3,000 people walk through the doors daily. Bookmobiles make about 25 stops six days a week traveling across the county and the Library provides services to 40 senior living facilities and 130 homebound individuals. The Digital Branch Library, www.tscpl.org, serves customers' needs 24/7.

The work includes demoing the existing finishes, fixtures, ceilings, lights, and portions of selected walls; then provide new finishes, fixtures, ceilings and accessories. The renovation of the Room 123 Remodel shall occur in a single phase.

BID RECEIVING

Date: Tuesday, July 7, 2026

Time: 2:00 PM CST

Place: TEAMS attendance online or call 1-347-991-6844

Meeting ID: 225 826 044 173 243

Password: YE9RG9U8

Phone Conference ID: 923 172 955#

TIMELINE OF BID PROCESS

RFP Issued:	Friday, June 6, 2026
Optional Site Visit:	Tuesday, June 23, 2026 at 9 AM CST
Questions Due:	Friday, June 26, 2026
Final Addendum Issued:	Wednesday, July 1, 2026
Bid Receiving:	Tuesday, July 7, 2026 at 2:00 PM CST; bids must be received prior to this time
Board Consideration of Award:	Thursday, July 16, 2026 4:00 pm CST; bidders do not need to be present at the Board

	meeting
Notification of Decision to Bidders:	on or before Monday, July 20, 2026 (via email)
Contract Awarded:	Upon final legal approval
Project Completion Date:	As indicated by the contractor on the bid form.

*bidder questions must be submitted to the Project Coordinator in writing, preferably by email.

OWNER

Topeka & Shawnee County Public Library
1515 S.W. 10th Avenue
Topeka, KS 66604-1374

Project Coordination: Thad Hartman, Chief of Staff
P: 785-580-4481
E: thartman@tscpl.org

INSTRUCTIONS TO BIDDERS

Date: June 5, 2026

PROJECT: Room 123 Remodel

DEFINITIONS:

Bidding documents include Invitation to Bid, Instructions to Bidders, and Bid Form including any Addenda issued prior to bid receiving.

Definitions set forth in the General Conditions of the Contract for Construction AIA Document A-105, 2017 Edition, are applicable in these Instructions to Bidders.

ADDENDA:

Addenda are written or graphic instruments issued prior to bid receiving which modify or interpret the bidding documents, including specifications, additions, deletions, clarifications, or corrections.

Prior to bid receiving, Addenda will be posted on the Owner's website and each Bidder recorded by the Owner as having received the bidding documents will be notified.

Bidders shall acknowledge receipt of Addenda on the Bid Form.

Any questions or requests for information by interested bidders must be submitted in writing to the Project Coordinator, preferably by email, and will be posted on the Library's webpage as a public document for anyone's review.

EXAMINATION OF BIDDING DOCUMENTS:

Each Bidder shall examine the bidding documents carefully. Any interpretation or correction will be issued as an Addendum by the Owner. **ONLY A WRITTEN INTERPRETATION OR CORRECTION BY ADDENDUM SHALL BE BINDING.**

SITE VISIT (OPTIONAL):

Each Bidder shall have the opportunity to visit the site. The site visit will be held on Wednesday, **Tuesday, June 23, 2026, at 9:00 AM CST** at the main entrance to the Library, 1515 SW 10th Ave. Topeka, KS. Acknowledge site visit on the BID FORM.

BID PREPARATION

A single lump sum bid will be received for a single General Contract for the completion of all work outlined in the Contract Documents. Additionally there are three alternates for which changes to the base bid are requested on the Bid Form.

The Owner is a political subdivision of the State of Kansas, eligible for government contract prices, and is exempt for the Kansas Retailers' Sales Tax Act and Kansas Compensating Tax Act under the provisions of Kansas Statutes Annotated (K.S.A.) Supplement 79-3606(b).

Bids shall be made upon the BID FORM included with these specifications. Fill in all blanks on the BID FORM clearly with typewriter or ink. Erasures or other changes in a bid must be explained or noted over the signature of the Bidder. Signature shall be in longhand by a principal duly authorized to sign contracts. Bids shall contain no alterations or recapitulation of

the work.

The Owner reserves the right to: (1) waive any informalities or minor defects in the bids or bidding procedures; (2) reject any or all bids; (3) rebid the project at a later date if bids are rejected; and (4) accept the bid that, in the judgment of the Topeka & Shawnee County Public Library, will be in the best interest of the Library, whether or not said bid is the lowest bid.

Bidders may not use omissions or errors in the Specifications or other contract documents to their advantage. The Owner reserves the right to issue new instructions correcting any such errors or omissions, which new instructions shall be treated as if originally included.

The Owner may make any investigation it deems necessary to determine the ability of the Bidder to perform the work. Bidders shall furnish information for this purpose to the Owner upon request. The Owner reserves the right to reject any bid if the evidence submitted by, or other investigation of, the Bidder fails to satisfy the Owner that the Bidder has the proper qualifications, experience, equipment, manpower, or financial and managerial capability to carry out the obligations of the contract agreement or to perform the work as specified.

The Bidder shall be paid in accordance with contract agreement upon award.

Bids shall be prepared and submitted in accordance with these INSTRUCTIONS TO BIDDERS.

Email Bid Submission:

- a. Email Bid submission to thartman@tscpl.org and copy mms@htkarchitects.com
 1. Email subject: Room 123 Remodel Bid.
- b. Within five days of the bid, bid results will be available from Maddie Safford at mms@htkarchitects.com.
- c. Once a bid has been submitted, you should receive an email back from mms@htkarchitects.com or iou@htkarchitects.com. If you do not receive this email, please contact Maddie Safford or Isabelle Ure at 785-266-5373 to verify your bid has been received.
- d. Attendance at the bid receiving is not required. Bids will be read out loud, recorded and a bid tabulation will be emailed to those who submit bids.

COORDINATOR: The Coordinator shall assume general coordination and direction of the project. The Coordinator is:

Thad Hartman
Chief of Staff
P: 785-580-4481
E: thartman@tscpl.org

BID SECURITY

Bid Security, consisting of a bid bond, certified check, or cashier's check on a solvent bank, shall be enclosed with each bid in the amount of five (5) percent of the Base Bid.

Bid Security shall be made payable, without conditions, to as a guarantee that the Bidder, if awarded the contract, will promptly execute the formal contract in accordance with the Bid and Contract Documents, and that he will furnish the special bonds for the faithful performance thereof. Bid Securities will be retained until the contract is awarded or other disposition is made thereof.

Bid Security may be forfeited as liquidated damages for all costs, delay, and other expenses created if the successful bidder fails to execute the contract and furnish the Certificate of Insurance and Bonds as required in by the Contract Documents.

BOND / INSURANCE REQUIREMENTS

Within seven (7) days of the notification of intent to issue a contract, the selected Bidder shall furnish the following:

- 1) A Performance Bond in the amount of 100 percent of the contract price.
- 2) A Statutory (Material and Labor Payment) Bond in the amount of 100 percent of the contract price.
- 3) Evidence satisfactory to Owner that Contractor's insurance coverages have been secured.

Furnish bonds on forms and with sureties approved by the Owner, and authorized to transact business in Kansas.

Furnish Owner, through the Architect, with two copies each of the Performance Bond and Insurance Certificate.

Contractor shall file Statutory Bond and pay fee to clerk of district court of the county in which the project is constructed. Furnish Owner, through the Architect, with two copies of Statutory Bond indicating that the bond has been duly filed with clerk of the district court.

ALTERNATE BIDS

Each Bidder shall bid all alternates included on the Bid Form, except that should he desire not to bid an alternate, he may insert the words "no bid" in the space provided for prices for such alternate. When a Bidder writes "no bid" for one or more alternates, he thereby waives any claim to the contract award if that alternate (or those alternates) becomes the basis for determining the low bid and/or changes the contract award. If an alternate price called for involves no change in price, Bidder shall so indicate by writing the words "no change" in the space provided. If the space provided for an alternate price is blank, that shall mean "no bid."

BIDDER'S REPRESENTATION:

The Bidder, by responding to this bid, represents that

1. The Bidder read and understood the INSTRUCTIONS TO BIDDERS.
2. The Bidder carefully examined all bidding documents pertaining to the project.
3. The Bidder acknowledges receipt of Addenda, if any.
4. The Bidder acknowledges the option to visit the site.

BID RECEIVING:

The Owner will receive and publicly open and read bid proposal forms at the time and place indicated in the INVITATION TO BID.

The bid proposal shall include all costs for labor, materials, equipment, services and incidentals necessary to complete the work as represented in the Contract Documents.

No oral or telephone bids will be considered. Modifications by telephone will be considered only on BID FORMS delivered to Owner prior to time set for bid receiving.

BID WITHDRAWAL:

A Bidder may withdraw a BID FORM in writing, including via email, to Owner prior to time fixed for bid receiving.

Unless otherwise provided in any supplement to these INSTRUCTIONS TO BIDDERS, no Bidder shall modify, withdraw, or cancel the bid, or any part thereof, for thirty (30) calendar days after the date for receiving bids.

EVALUATION CRITERIA:

The Owner intends to accept the bid that, in the judgment of the Topeka & Shawnee County Public Library, will be the best interest of the Library, whether or not said bid is the lowest bid. Criteria that shall be taken into consideration shall include, but not be limited to: the proposed cost, proposed time of completion, experience and competency of the contractor, demonstrated performance to complete similar work, capacity to complete work on time, and competency of proposed subcontractors to be utilized.

AWARD OF CONTRACT:

The approved bidder must be prepared to provide a service/purchase contract upon notification of bid approval. A contract will be awarded as soon as possible to the responsible Bidder submitting the lowest acceptable bid, provided:

1. Evidence of the experience, qualifications and fiscal responsibility of the Bidder and the time of completion are all acceptable to the Owner.
2. The total of acceptable bids is within the Owner's financial budget for the project.
3. The contract is legally acceptable.

REJECTION OF BIDS:

The Bidder acknowledges the Owner's right to reject any and all bids and to waive any formality or irregularity in any bid received. The Bidder recognizes the Owner's right to reject any bid, which fails to submit the data required by the bidding documents, or is in any way incomplete or irregular. An award to the lowest Bidder is not required.

PROPOSED SCOPE OF WORK:

Please refer to page 2 of this Request for Proposal for a brief summary of the proposed scope of work.

The complete scope of work to be completed by the contractor is represented in the Contract Documents dated June 5, 2026.

SPECIFICATIONS:

Drawings and specifications will be issued digitally and must be obtained from the Topeka, and Shawnee County Public Library web site at <https://tscpl.org/about/request-for-proposals> This is the official location for project bid information.

BID FORM--Single Contract

Owner: Topeka & Shawnee County Public Library
1515 S.W. 10th Avenue
Topeka, KS 66604-1374

Bidder Name: _____

BASE BID

In compliance with the invitation and instructions to Bidders, the undersigned proposes to provide all labor, materials, equipment services, and incidentals necessary for the complete construction of the Project in accordance with the Construction Documents at the prices stated below. The Undersigned agrees to perform all Work indicated on the Drawings and described in the Specifications and Addenda thereto for the complete construction for the total sum of:

_____ dollars (\$ _____)

ADDENDA

Receipt is acknowledged of Addenda numbers _____.

OPTIONAL SITE VISIT: A representative chose to visit. **YES** _____ **NO** _____

TIME OF COMPLETION

Project is estimated to be Substantially Complete by the end of December, 2026. Bidder to indicate anticipated date of substantial completion if differs from above.
Bidders shall submit with the bid a schedule displaying the project schedule.

Date of Substantial Completion for bid: _____

MAJOR SUBCONTRACTORS

The undersigned lists and identifies the major subcontractors included as part of this Bid, and further agrees that in the event of receiving the Awarded Contract for the work identified and listed, and contingent on their being acceptable to the Owner, they will be included as a part of the written contract. If award of Alternates affects subcontractors shown, list other subcontractors as applicable for each type of work and combination of Alternates.

Plumbing Construction _____

Mechanical (HVAC) Construction _____

Electrical Construction _____

Painting Contractor _____

Flooring Contractor _____

Field Superintendent _____

CONTRACT

If notified of the acceptance of this bid within forty five (45) calendar days of the time set for opening of bids, Undersigned agrees to execute The *Standard Short Form of Agreement Between Owner and Contractor*, AIA 105 – 2017, and supplementary conditions, within (7) calendar days of receipt of such notification and in accordance with the bid and the Contract Documents.

BOND

The Undersigned agrees, if awarded the Contract, to execute and deliver to the Architect at the time of Contract Signing a Performance Bond and Labor and Materials Payment Bond in the amounts equal to 100% of the Contract Sum as set forth in the Instructions to Bidders.

DECLARATION

The undersigned hereby declares the bid specifications have been carefully examined and this proposal is submitted in compliance therewith. The undersigned understands that competence and responsibility, time of completion, as well as any other factors of interest to the Owner may be a consideration in making the award. The Owner reserves the right to reject any or all proposals, to accept or reject alternate proposals and unit prices, and waive technicalities concerning the bid proposals received as it may be in the Owner's best interest to do so.

Authorized Representative's Signature

Date

Title

Telephone

Company

E-Mail

Street Address

City/State/Zip

SECTION 006021 - SUPPLEMENTARY CONDITIONS

1. General Conditions:
Instruction to Bidder, Bid Form, Addenda and The Standard Form of Agreement Between Owner and Contractor, A.I.A. Document A105, 2017 Edition, Articles 1 through 17 inclusive, is a part of this contract.
2. Supplements:
The following supplements modify, change, delete from or add to the The Standard Form of Agreement Between Owner and Contractor, A.I.A. Document A105, 2017 Edition. Where any article of the Agreement is modified or any paragraph, subparagraph or clause thereof is modified or deleted by these Supplements, the unaltered provisions of that article, paragraph, subparagraph or clause shall remain in effect.
3. In the following Articles contained in Agreement wherever "Architect" is referenced the word "Architect" shall be deleted and "Owner" or "Owners Representative" shall be added; Articles 9.2, 9.4, 9.5, and 9.6.
4. Add Paragraph 1.2:
"The work referred to in these documents consists of the furnishing of all labor, materials and equipment for the complete installation of all work as specified herein and shown on the drawings, including delivery, unloading, uncrating, assembling, setting-in-place, leveling, adjustment, completely installing and cleaning up of any debris.

"The work shall be in strict accordance with the Drawings and Specifications.

"The Contractor shall thoroughly investigate all local trade jurisdictional rulings and shall be held completely responsible for the settlement of any disputes arising from fabrication, installation, or completion of the Work under this Contract."
5. Subparagraph 5.1.7
List the Following Types of Insurance or Bonds to be provided by the Contractor:

Types of Insurance or Bond	Limit of liability or bond amount
Liability Insurance	Reference Draft Contract and specifications
Bid Bond	5% of Contract Amount
Performance Bond	100% of Contract Amount
Payment Bond	100% of Contract Amount
Statutory Bond	100% of Contract Amount

Contractor's Commercial General Liability policy must name **Topeka and Shawnee County Public Library** as an additional insured; the policy must also include a Waiver for Subrogation in favor of **Topeka and Shawnee Country Public Library**.

Contractor shall provide Topeka and Shawnee County Public Library prior to commencement of work, a Certificate of Insurance providing evidence that required coverages are in force and will not be cancelled within at least 30 days notice to the Owner. Contractor and Subcontractor shall evidence required insurance coverages on the Certificate of Insurance (AIA Document G705) or other certificate approved as to form by Owner.
6. Article 7: Add the following
"7.5 ARCHITECT'S COMPENSATION FOR SERVICES TO REMEDY DEFECTIVE WORK
When the Architect's Additional services are required because of defective Work, neglect, failure, deficiencies, or default by the Contractor, the Architect's compensation for such services shall be based on the Architect's invoice to the Owner. The invoice, when approved by the Owner, along with other cost, damages and liabilities incurred by the Owner or the Architect, shall be the basis

for adjusting the Contract Sum, by Change Order, to compensate the Owner for the Architect's Additional Services."

7. Subparagraph 8.1.2: To the end of the paragraph add the following:
"The Contractor shall assume general coordination and direction of the project. Each Contractor shall foster cooperation between subcontractors and schedule their work in sequence to facilitate and not delay their installation. The Architect is neither the coordinator nor the expeditor of the work of the various contracts.
8. Subparagraph 8.1.3: Add the following:
"Insofar as the Contract Documents have been prepared in accordance with applicable laws, statutes, building codes and regulations, the Contractor shall execute the work in accordance with their intent and with said laws, statutes, building codes and regulations. Refer to Section 014200 and other applicable portions of the Contract Documents for specific requirements."
9. Subparagraph 8.1.4: Add the following:
"If the Contractor performs any construction activity knowing it involves a recognized error, inconsistency or omission in the Contract Documents without such notice to the Architect, the Contractor shall thereby assume responsibility for performance and shall bear the attributable cost for correction."
10. Paragraph 8.5 Warranty:
Add Subparagraph 8.5.1: The Contractor shall and does hereby guarantee all work for a period of one (1) year from the Date of Substantial Completion of the Work. All movable or adjustable parts shall remain in good working order, including hardware, apparatus, electrical and all other equipment. Nothing in the above intends or implies that this guarantee shall apply where damage occurs due to improper maintenance or operation, or to normal wear and usage. *"This obligation shall survive termination of the Contract. This provision does not alter or waive any implied warranties which may arise."*
11. Paragraph 8.5 Warranty:
Add Subparagraph 8.5.2: "If the Contractor has received notice within one year after the date of substantial completion, the Contractor's obligation to correct nonconforming work shall still be due, notwithstanding the expiration of the notification period.
12. Paragraph 8.5 Warranty:
Add Subparagraph 8.5.3: All warranties required by the Contract Documents shall commence on the date of Substantial Completion of the work or designated portions thereof, or for work first completed after Substantial Completion, on the date of its acceptance, unless some other commencement date is specifically referenced elsewhere in the contract documents for a specific warranty. The Contractor shall be required to secure any extended warranties or special riders to standard warranties which are required to comply with these requirements."

"If the Contractor has received notice within one year after the date of substantial completion, the Contractor's obligation to correct nonconforming work shall still be due, notwithstanding the expiration of the notification period.
13. Paragraph 8.6 Taxes, Omit and replace with:
The owner is a political subdivision of the State of Kansas, eligible for government contract prices, and is exempt from the Kansas Retailer's State Tax Act and Kansas Compensating Tax Act under the provisions of Kansas Statutes Annotated (K.S.A.) Supplement 79-3606(b). After bidding, the owner will provide a sale exemption number to the contractor.
14. Add Subparagraph 8.9.1.
"8.9.1 Protection of construction materials and equipment and Owner furnish materials and equipment to be incorporated in the Work stored at the Project site from weather, flood,

environmental conditions, theft, damage and all other adversity is solely the responsibility of the Contractor."

15. Add Subparagraph 8.9.2
"8.9.2 Without prior approval of the Owner, the Contractor shall not permit any workers to use any existing facilities at the Project site, including, without limitations, lavatories, toilets, entrances, and parking areas other than those designated by the Owner. The Contractor shall comply with all rules promulgated by the Owner in connection with the use and occupancy of the Project site as amended for time to time."
16. Paragraph 8.12: Add the following:
"8.12.2: Notwithstanding Subparagraph 8.12, 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 from or resulting from blasting activities at the site of the Work, irrespective of the degree of care utilized by the Contractor, a Subcontractor, or anyone directly or indirectly employed by them, in the course of performing those blasting activities."
17. Subparagraph 10.1: Add the following to the second sentence:
". . . plus a reasonable credit for overhead and profit, but in no case less than 75% of the amount which would be included for an increase in the Contract Sum, unless otherwise substantiated by the Contractor and approved by the Architect."
18. Paragraph 10.3.1: Add the following subparagraph:
"10.4: The allowance for combined overhead and profit to be included in the total cost to the Owner for any of the methods for determining adjustments to the Contract Sum shall not exceed the following schedule:
 1. For the Contractor, for Work performed by the Contractor's own forces, 10 percent of the cost.
 2. For the Contractor, for Work performed by the Contractor's Subcontractor, 5 percent of the amount due the Subcontractor.
 3. For each Subcontractor's or Sub-subcontractor's own forces, 10 percent of the cost.
 4. Cost to which overhead and profit is to be applied shall be determined in accordance with Subparagraph 7.3.7.
 5. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner prescribed in 7.3.7. Where major cost items are Subcontracts, they shall also be itemized. In no case will a change involving more than \$500.00 be approved without such itemization."
19. Add paragraph 11.4
Weather day claims will not be evaluated for this project.
20. Add paragraph 11.5
LIQUIDATED DAMAGES
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 following the established contract completion date until the Work is substantially complete. Such sum shall be deducted from the contract amount by contract change order or directive prior to the final payment.

Liquid Damages Amount per Calendar Day: **\$750.**
21. Subparagraph 12.2.2: Add the following:

"12.2.2.1. Ten percent of the certified amount completed shall be withheld as retainage. If the Owner and Architect are satisfied with the Contractor's progress and quality of the work when the entire work of the contract has been determined to be Substantially Complete by the Architect, the Contractor may request that the retainage be reduced to five (5) percent of the total contract amount on remaining payment requests. Prior to any reduction in the retained percentage or amount, the Contractor shall be required to submit a completed AIA Document G707A, Consent of Surety to Reduction In or Partial Release of Retainage. The Owner and Architect reserve the right to reinstate the full ten (10) percent retainage of the certified amounts completed on future payment requests if the work falls behind the construction progress schedule or is not in or portions thereof found not in conformance with the intent of the Contract Documents.

12.2.2.2. The Contractor shall not permit any lien to attach to Library property."

22. Article 12: Add the following:

"12.7 CONTRACTOR'S ACKNOWLEDGMENT AND CERTIFICATION

"12.7.1 With each pay application, the Contractor shall provide Owner with a statement under oath certifying that Contractor has paid all subcontractors the sums due and owing to Subcontractors as evidenced by prior Applications for Payment. Contractor shall not be entitled to receive any further payments pursuant to the Agreement unless and until Contractor is in compliance with the terms of this paragraph. Contractor acknowledges the right of Owner to advise subcontractors and sub-subcontractors that Owner has made a Progress Payment or has made Final Payment to the Contractor."

23. Subparagraph 13.1: Add the following:

"13.1.2 Notwithstanding any reference to any rule or regulation, neither the Architect nor the Owner shall assume any duty to provide supervision of construction methods or processes or to enforce compliance with any safety regulations."

END OF SUPPLEMENTARY CONDITIONS

DRAFT AIA® Document A105™ – 2017

Standard Short Form of Agreement Between Owner and Contractor

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)

«Topeka and Shawnee County Public Library»
«1515 SW 10th Street»
«Topeka, KS 66604»

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

« »« »
« »
« »
« »

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

«Topeka and Shawnee County Public Library»
«Room 123 Remodel»

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

«HTK Architects, Inc.»
«900 S. Kansas Ave., Suite 200»
«Topeka, KS 66612»

The Owner and Contractor agree as follows.

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

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

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ARTICLE 1 THE CONTRACT DOCUMENTS

The Contractor shall complete the Work described in the Contract Documents for the Project. The Contract Documents consist of

- .1 this Agreement signed by the Owner and Contractor;
- .2 the drawings and specifications prepared by the Architect, dated « », and enumerated as follows:

Drawings:

Number	Title	Date

Specifications:

Section	Title	Pages

- .3 addenda prepared by the Architect as follows:

Number	Date	Pages

- .4 written orders for changes in the Work, pursuant to Article 10, issued after execution of this Agreement; and

.5 other documents, if any, identified as follows:

<< >>

ARTICLE 2 DATE OF COMMENCEMENT AND SUBSTANTIAL COMPLETION

§ 2.1 The Contract Time is the number of calendar days available to the Contractor to substantially complete the Work.

§ 2.2 Date of Commencement:

Unless otherwise set forth below, the date of commencement shall be the date of this Agreement.
(Insert the date of commencement if other than the date of this Agreement.)

<< >>

§ 2.3 Substantial Completion:

Subject to adjustments of the Contract Time as provided in the Contract Documents, the Contractor shall achieve Substantial Completion, as defined in Section 12.5, of the entire Work:
(Check the appropriate box and complete the necessary information.)

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

[<< >>] By the following date: << >>

ARTICLE 3 CONTRACT SUM

§ 3.1 The Contract Sum shall include all items and services necessary for the proper execution and completion of the Work. Subject to additions and deductions in accordance with Article 10, the Contract Sum is:

<< >> (\$ << >>)

§ 3.2 For purposes of payment, the Contract Sum includes the following values related to portions of the Work:
(Itemize the Contract Sum among the major portions of the Work.)

Portion of the Work	Value

§ 3.3 The Contract Sum is based upon the following alternates, if any, which are described in the Contract Documents and hereby accepted by the Owner:
(Identify the accepted alternates. If the bidding or proposal documents permit the Owner to accept other alternates subsequent to the execution of this Agreement, attach a schedule of such other alternates showing the amount for each and the date when that amount expires.)

<< >>

§ 3.4 Allowances, if any, included in the Contract Sum are as follows:
(Identify each allowance.)

Item	Price

§ 3.5 Unit prices, if any, are as follows:
(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)

ARTICLE 4 PAYMENTS

§ 4.1 Based on Contractor's Applications for Payment certified by the Architect, the Owner shall pay the Contractor, in accordance with Article 12, as follows:

(Insert below timing for payments and provisions for withholding retainage, if any.)

«Payments shall be made by the Owner not later than thirty (30) days after the Architect receives the Application for Payment. »

§ 4.2 Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate below, or in the absence thereof, at the legal rate prevailing at the place of the Project.

(Insert rate of interest agreed upon, if any.)

«0 » % « »

ARTICLE 5 INSURANCE

§ 5.1 The Contractor shall maintain the following types and limits of insurance until the expiration of the period for correction of Work as set forth in Section 14.2, subject to the terms and conditions set forth in this Section 5.1:

§ 5.1.1 Commercial General Liability insurance for the Project, written on an occurrence form, with policy limits of not less than «one million dollars » (\$ «1,000,000.00 ») each occurrence, «two million dollars » (\$ «2,000,000.00 ») general aggregate, and «two million dollars » (\$ «2,000,000 ») aggregate for products-completed operations hazard.

§ 5.1.2 Automobile Liability covering vehicles owned, and non-owned vehicles used, by the Contractor, with policy limits of not less than «one million dollars » (\$ «1,000,000 ») 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.

§ 5.1.3 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 that such primary and excess or umbrella insurance policies result in the same or greater coverage as those required under Section 5.1.1 and 5.1.2, and in no event shall any excess or umbrella liability insurance provide narrower coverage than the primary policy. The excess policy shall not require exhaustion of the underlying limits only through the actual payment by the underlying insurers.

§ 5.1.4 Workers' Compensation at statutory limits.

§ 5.1.5 Employers' Liability with policy limits not less than «one million dollars » (\$ «1,000,000.00 ») each accident, «one million dollars » (\$ «1,000,000.00 ») each employee, and «one million dollars » (\$ «1,000,000 ») policy limit.

§ 5.1.6 The Contractor shall provide builder's risk insurance to cover the total value of the entire Project on a replacement cost basis.

§ 5.1.7 Other Insurance Provided by the Contractor

(List below any other insurance coverage to be provided by the Contractor and any applicable limits.)

Coverage	Limits
Performance Bond	100% of Contract Amount
Payment Bond	100% of Contract Amount
Statutory Bond	100% of Contract Amount

§ 5.2 The Owner shall be responsible for purchasing and maintaining the Owner's usual liability insurance and shall provide property insurance to cover the value of the Owner's property. The Contractor is entitled to receive an increase in the Contract Sum equal to the insurance proceeds related to a loss for damage to the Work covered by the Owner's property insurance.

§ 5.3 The Contractor shall obtain an endorsement to its Commercial General Liability insurance policy to provide coverage for the Contractor's obligations under Section 8.12.

§ 5.4 Prior to commencement of the Work, each party shall provide certificates of insurance showing their respective coverages.

§ 5.5 Unless specifically precluded by the Owner's property insurance policy, the Owner and Contractor waive all rights against (1) each other and any of their subcontractors, suppliers, agents, and employees, each of the other; and (2) the Architect, Architect's consultants, and any of their agents and employees, for damages caused by fire or other causes of loss to the extent those losses are covered by property insurance or other insurance applicable to the Project, except such rights as they have to the proceeds of such insurance.

ARTICLE 6 GENERAL PROVISIONS

§ 6.1 The Contract

The Contract represents the entire and integrated agreement between the parties and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written modification in accordance with Article 10.

§ 6.2 The Work

The term "Work" means the construction and services required by the Contract Documents, and includes all other labor, materials, equipment, and services provided, or to be provided, by the Contractor to fulfill the Contractor's obligations.

§ 6.3 Intent

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.

§ 6.4 Ownership and Use of Architect's Drawings, Specifications and Other Documents

Documents prepared by the Architect are instruments of the Architect's service for use solely with respect to this Project. The Architect shall retain all common law, statutory, and other reserved rights, including the copyright. The Contractor, subcontractors, sub-subcontractors, and suppliers are authorized to use and reproduce the instruments of service solely and exclusively for execution of the Work. The instruments of service may not be used for other Projects or for additions to this Project outside the scope of the Work without the specific written consent of the Architect.

§ 6.5 Electronic Notice

Written notice under this Agreement may be given by one party to the other by email as set forth below.
(Insert requirements for delivering written notice by email 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.)

« Electronic Notice is declined. Provide written notice. »

ARTICLE 7 OWNER

§ 7.1 Information and Services Required of the Owner

§ 7.1.1 If requested by the Contractor, the Owner shall furnish all necessary surveys and a legal description of the site.

§ 7.1.2 Except for permits and fees under Section 8.7.1 that are the responsibility of the Contractor, the Owner shall obtain and pay for other necessary approvals, easements, assessments, and charges.

§ 7.1.3 Prior to commencement of the Work, at the written request of 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.

§ 7.2 Owner's Right to Stop the Work

If the Contractor fails to correct Work which is not in accordance with the Contract Documents, the Owner may direct the Contractor in writing to stop the Work until the correction is made.

§ 7.3 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 seven day period after receipt of written notice from the Owner to commence and continue correction of

such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies, correct such deficiencies. In such case, the Architect may withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the cost of correction, provided the actions of the Owner and amounts charged to the Contractor were approved by the Architect.

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

§ 7.4.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and to award separate contracts in connection with other portions of the Project.

§ 7.4.2 The Contractor shall coordinate and cooperate with the Owner's own forces and separate contractors employed by the Owner.

ARTICLE 8 CONTRACTOR

§ 8.1 Review of Contract Documents and Field Conditions by Contractor

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

§ 8.1.2 The Contractor shall carefully study and compare the Contract Documents with each other and with information furnished by the Owner. Before commencing activities, the Contractor shall (1) take field measurements and verify field conditions; (2) carefully compare this and other information known to the Contractor with the Contract Documents; and (3) promptly report errors, inconsistencies, or omissions discovered to the Architect.

§ 8.2 Contractor's Construction Schedule

The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work.

§ 8.3 Supervision and Construction Procedures

§ 8.3.1 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.

§ 8.3.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner, through the Architect, the names of subcontractors or suppliers for each portion of the Work. The Contractor shall not contract with any subcontractor or supplier to whom the Owner or Architect have made a timely and reasonable objection.

§ 8.4 Labor and Materials

§ 8.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work.

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

§ 8.5 Warranty

The Contractor warrants to the Owner and Architect that: (1) materials and equipment furnished under the Contract will be new and of good quality unless otherwise required or permitted by the Contract Documents; (2) the Work will be free from defects not inherent in the quality required or permitted; and (3) the Work will conform to the requirements of the Contract Documents. Any material or equipment 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 12.5.

§ 8.6 Taxes

The Contractor shall pay sales, consumer, use, and similar taxes that are legally required when the Contract is executed.

§ 8.7 Permits, Fees and Notices

§ 8.7.1 The Contractor shall obtain and pay for the building permit and other permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work.

§ 8.7.2 The Contractor shall comply with and give notices required by agencies having jurisdiction over the Work. 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 full responsibility for such Work and shall bear the attributable costs. The Contractor shall promptly notify the Architect in writing of any known inconsistencies in the Contract Documents with such governmental laws, rules, and regulations.

§ 8.8 Submittals

The Contractor shall promptly review, approve in writing, and submit to the Architect shop drawings, product data, samples, and similar submittals required by the Contract Documents. Shop drawings, product data, samples, and similar submittals are not Contract Documents.

§ 8.9 Use of Site

The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits, the Contract Documents, and the Owner.

§ 8.10 Cutting and Patching

The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly.

§ 8.11 Cleaning Up

The Contractor shall keep the premises and surrounding area free from accumulation of debris and trash related to the Work. At the completion of the Work, the Contractor shall remove its tools, construction equipment, machinery, and surplus material; and shall properly dispose of waste materials.

§ 8.12 Indemnification

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.

ARTICLE 9 ARCHITECT

§ 9.1 The Architect will provide administration of the Contract as described in the Contract Documents. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 9.2 The Architect will visit the site at intervals appropriate to the stage of construction to become generally familiar with the progress and quality of the Work.

§ 9.3 The Architect will not have control over or charge of, and will not be responsible for, construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility. The Architect will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents.

§ 9.4 Based on the Architect's observations and evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor.

§ 9.5 The Architect has authority to reject Work that does not conform to the Contract Documents.

§ 9.6 The Architect will promptly review and approve or take appropriate action upon Contractor's submittals, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 9.7 On written request from either the Owner or Contractor, the Architect will promptly interpret and decide matters concerning performance under, and requirements of, the Contract Documents.

§ 9.8 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.

§ 9.9 The Architect's duties, responsibilities, and limits of authority as described in the Contract Documents shall not be changed without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

ARTICLE 10 CHANGES IN THE WORK

§ 10.1 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract, consisting of additions, deletions or other revisions, and the Contract Sum and Contract Time shall be adjusted accordingly, in writing. If the Owner and Contractor cannot agree to a change in the Contract Sum, the Owner shall pay the Contractor its actual cost plus reasonable overhead and profit.

§ 10.2 The Architect may authorize or 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. Such authorization or order shall be in writing and shall be binding on the Owner and Contractor. The Contractor shall proceed with such minor changes promptly.

§ 10.3 If concealed or unknown physical conditions are encountered at the site that differ materially from those indicated in the Contract Documents or from those conditions ordinarily found to exist, the Contract Sum and Contract Time shall be subject to equitable adjustment.

ARTICLE 11 TIME

§ 11.1 Time limits stated in the Contract Documents are of the essence of the Contract.

§ 11.2 If the Contractor is delayed at any time in progress of the Work by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, or other causes beyond the Contractor's control, the Contract Time shall be subject to equitable adjustment.

§ 11.3 Costs caused by delays or by improperly timed activities or defective construction shall be borne by the responsible party.

ARTICLE 12 PAYMENTS AND COMPLETION

§ 12.1 Contract Sum

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

§ 12.2 Applications for Payment

§ 12.2.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for Work completed in accordance with the values stated in this Agreement. The Application shall be supported by data substantiating the Contractor's right to payment as the Owner or Architect may reasonably require, such as evidence of payments made to, and waivers of liens from, subcontractors and suppliers. Payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment stored, and protected from damage, off the site at a location agreed upon in writing.

§ 12.2.2 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 other encumbrances adverse to the Owner's interests.

§ 12.3 Certificates for Payment

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; (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 in writing of the Architect's reasons for withholding certification in part; 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. If certification or notification is not made within such seven day period, the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time and the Contract Sum shall be equitably adjusted due to the delay.

§ 12.4 Progress Payments

§ 12.4.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner provided in the Contract Documents.

§ 12.4.2 The Contractor shall promptly pay each subcontractor and supplier, upon receipt of payment from the Owner, an amount determined in accordance with the terms of the applicable subcontracts and purchase orders.

§ 12.4.3 Neither the Owner nor the Architect shall have responsibility for payments to a subcontractor or supplier.

§ 12.4.4 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 requirements of the Contract Documents.

§ 12.5 Substantial Completion

§ 12.5.1 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 the Owner can occupy or utilize the Work for its intended use.

§ 12.5.2 When the Contractor believes that the Work or designated portion thereof is substantially complete, it will notify the Architect and the Architect will make an inspection to determine whether the Work is substantially complete. When the Architect determines that the Work is substantially complete, the Architect shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, establish the responsibilities of the Owner and Contractor, 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.

§ 12.6 Final Completion and Final Payment

§ 12.6.1 Upon receipt of a final Application for Payment, the Architect will inspect the Work. When the Architect finds the Work acceptable and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment.

§ 12.6.2 Final payment shall not become due until the Contractor submits to the Architect releases and waivers of liens, and data establishing payment or satisfaction of obligations, such as receipts, claims, security interests, or encumbrances arising out of the Contract.

§ 12.6.3 Acceptance of final payment by the Contractor, a subcontractor or 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 13 PROTECTION OF PERSONS AND PROPERTY

The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs, including all those required by law in connection with performance of the Contract. The Contractor shall take reasonable precautions to prevent damage, injury, or loss to employees on the Work and other persons who may be affected thereby, the Work and materials and equipment to be incorporated therein, and other property at the site or adjacent thereto. The Contractor shall promptly remedy damage and loss to property caused in whole or in part by the Contractor, or by anyone for whose acts the Contractor may be liable.

ARTICLE 14 CORRECTION OF WORK

§ 14.1 The Contractor shall promptly correct Work rejected by the Architect as failing to conform to the requirements of the Contract Documents. The Contractor shall bear the cost of correcting such rejected Work, including the costs of uncovering, replacement, and additional testing.

§ 14.2 In addition to the Contractor's other obligations including warranties under the Contract, the Contractor shall, for a period of one year after Substantial Completion, correct work not conforming to the requirements of the Contract Documents.

§ 14.3 If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct it in accordance with Section 7.3.

ARTICLE 15 MISCELLANEOUS PROVISIONS

§ 15.1 Assignment of Contract

Neither party to the Contract shall assign the Contract as a whole without written consent of the other.

§ 15.2 Tests and Inspections

§ 15.2.1 At the appropriate times, the Contractor shall arrange and bear cost of tests, inspections, and approvals of portions of the Work required by the Contract Documents or by laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities.

§ 15.2.2 If the Architect requires additional testing, the Contractor shall perform those tests.

§ 15.2.3 The Owner shall bear cost of tests, inspections, or approvals that do not become requirements until after the Contract is executed. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 15.3 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.

ARTICLE 16 TERMINATION OF THE CONTRACT

§ 16.1 Termination by the Contractor

If the Work is stopped under Section 12.3 for a period of 14 days through no fault of the Contractor, the Contractor may, upon seven additional days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed including reasonable overhead and profit, and costs incurred by reason of such termination.

§ 16.2 Termination by the Owner for Cause

§ 16.2.1 The Owner may terminate the Contract if the Contractor

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

§ 16.2.2 When any of the above reasons exist, the Owner, after consultation with the Architect, may without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' written notice, terminate employment of the Contractor and may

- .1 take possession of the site and of all materials thereon owned by the Contractor, and
- .2 finish the Work by whatever reasonable method the Owner may deem expedient.

§ 16.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 16.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 16.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. This obligation for payment shall survive termination of the Contract.

§ 16.3 Termination by the Owner for Convenience

The Owner may, at any time, terminate the Contract for the Owner’s convenience and without cause. The Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 17 OTHER TERMS AND CONDITIONS

(Insert any other terms or conditions below.)

« »

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

(If required by law, insert cancellation period, disclosures or other warning statements above the signatures.)

« »

OWNER *(Signature)*

« »« »

(Printed name and title)

CONTRACTOR *(Signature)*

« »« »

(Printed name and title)

LICENSE NO.:

JURISDICTION:



Project: _____ Substitution Request Number: _____

_____ From: _____

To: _____ Date: _____

_____ A/E Project Number: _____

Re: _____ Contract For: _____

Specification Title: _____ Description: _____

Section: _____ Page: _____ Article/Paragraph: _____

Proposed Substitution: _____

Manufacturer: _____ Phone: _____

Trade Name: _____ Model No.: _____

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

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

The Undersigned certifies:

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

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

Telephone: _____

A/E's REVIEW AND ACTION

- Substitution approved - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution approved as noted - Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.
- Substitution rejected - Use specified materials.
- Substitution Request received too late - Use specified materials.

Signed by: _____

Date: _____

Supporting Data Attached: Drawings Product Data Samples Tests Reports _____

Attach to E-Mail

Print a Copy

Save a Copy

Attach a file

Reset Form

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Work covered by the Contract Documents.
 - 2. Type of the Contract.
 - 3. Work by Owner and under other contracts.
 - 4. Use of premises.
 - 5. Owner's occupancy requirements.
 - 6. Work restrictions.
 - 7. Specification formats and conventions.
- B. Related Sections include the following:
 - 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
 - 2. Request for Proposal, Instruction to Bidders, and Bid Form

1.3 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Topeka & Shawnee County Public Library – Room 123 Remodel

1.4 Project Location:

- A. 1515 SW 10th Ave, Topeka, KS 66604
- B. Owner: Topeka & Shawnee County Public Library
 - 1. Owner's Representative: Thad Hartman, Chief of Staff 785-580-4481
thartman@tscpl.org
- C. Architect: HTK Architects, 900 S Kansas Ave. Suite 200, Topeka, KS 66612
- D. Engineer: Latimer Sommers & Associates, 3639 SW Summerfield Drive, Suite A, Topeka, KS 66614
- E. The Work consists of the following:
 - 1. The work includes demoing existing finishes and fixtures, then providing new finishes, fixtures, ceilings and accessories. The area of work is identified on the drawings. Furniture will be furnished and installed through a separate contract.

1.5 TYPE OF CONTRACT

- A. Project will be constructed under a single prime contract.
- B. A Building Permit is required for the work. The Contractor is responsible for submitting plans and specifications, and all other documents require to obtain the required permits. Contractor is responsible for any and all costs associated.

1.6 WORK PHASES

- A. The phasing of demolition activities shall be directed by the General Contractor and coordinated with notes provided in the drawings.
- B. Before commencing Work of each phase, submit a schedule showing the sequence, commencement and completion dates, and move-out and -in dates of Owner's personnel for all phases of the Work.

1.7 WORK UNDER OTHER CONTRACTS

- A. General: Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

1.8 USE OF PREMISES

- A. General: Contractor shall have limited use of premises for construction operations.
- B. Use of Site: Limit use of premises to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 - 1. Owner Occupancy: Owner will occupy property during construction.
 - 2. Driveways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
 - c. Schedule deliveries to not interfere with the owner's bus drop off & pick up schedule.
- C. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.
- D. No smoking or tobacco products are permitted on the property.

1.9 OWNER'S OCCUPANCY REQUIREMENTS

- A. Owner Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed areas of building, before Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and partial occupancy shall not constitute acceptance of the total Work.

1. Architect will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied before Owner occupancy.
2. Obtain a Certificate of Occupancy from authorities having jurisdiction before Owner occupancy.
3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of building.
4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of building.

1.10 SPECIFICATION FORMATS AND CONVENTIONS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

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SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
- C. Related Requirements:
 - 1. Section 014000 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.

1.2 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.
- C. Purchase products and systems selected by Architect from the designated supplier.

1.3 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.4 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.5 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.6 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include freight and delivery to Project site.
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. Unused allowances or partially used allowances may be applied toward change order items that are unrelated to the allowance. GC overhead and profit for allowances, shall be included in base bid.

1.7 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated. No change to Contractor's indirect expense is permitted for unrelated work done with excess allowance.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 1: Unforeseen Conditions: Include the sum of **\$10,000**
 - 1. This allowance is for work required due to unforeseen conditions encountered during construction and includes material cost, receiving, handling, and installation. General Contractor overhead and profit shall be included in base bid.

END OF SECTION 012100

SECTION 01 2600 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

1.2 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within time specified in Proposal Request or 20 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Work Change Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish

times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.4 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Changes Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.5 CONSTRUCTION CHANGE DIRECTIVE

1. Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

SECTION 01 2900 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 012600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 013200 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.2 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 - 2. Arrange schedule of values consistent with format of AIA Document G703.
 - 3. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
 - 4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - 5. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

6. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
7. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- F. Waivers of Mechanic's Lien: If required, with each Application for Payment, submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
- G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. List of subcontractors.

2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Submittal schedule (preliminary if not final).
 5. List of Contractor's staff assignments.
 6. List of Contractor's principal consultants.
 7. Copies of building permits.
 8. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 9. Initial progress report.
 10. Report of preconstruction conference.
 11. Certificates of insurance and insurance policies.
- H. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- I. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706-1994, "Contractor's Affidavit of Payment of Debts and Claims."
 5. AIA Document G706A-1994, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707-1994, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2900

SECTION 01 3100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Administrative and supervisory personnel.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.
- B. Related Sections:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract

1.3 DEFINITIONS

- A. RFI: Request to Owner, Architect, or Contractor seeking information from each other during construction.

1.4 KEY PERSONNEL

- A. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular telephone numbers and email addresses. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

1.5 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
1. Project name.
 2. Project number.
 3. Date.
 4. Name of Contractor.
 5. Name of Architect.
 6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
- E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

- F. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log monthly at progress meetings. Use CSI Log Form 13.2B or software generated log. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date Architect's response was received.
 8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.6 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.
1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.
 - j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Preparation of record documents.
 - m. Use of the premises and existing building.
 - n. Work restrictions.
 - o. Working hours.
 - p. Owner's occupancy requirements.
 - q. Responsibility for temporary facilities and controls.

- r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
4. Minutes: The Contractor is responsible for conducting the meeting and shall record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction or as requested by Architect.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Options.
 - b. Related RFIs.
 - c. Related Change Orders.
 - d. Review of mockups.
 - e. Possible conflicts.
 - f. Compatibility problems.
 - g. Time schedules.
 - h. Space and access limitations.
 - i. Installation procedures.
 - j. Required performance results.
 - k. Protection of adjacent work.
 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Progress Meetings: Conduct progress meetings at bi-weekly intervals.
1. Coordinate dates of meetings with preparation of payment requests.
 2. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties

involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

- 1) Review schedule for next period. Review present and future needs of each entity present, including the following:
 - 2) Interface requirements.
 - 3) Sequence of operations.
 - 4) Status of submittals.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Temporary facilities and controls.
 - 10) Progress cleaning.
 - 11) Quality and work standards.
 - 12) Status of correction of deficient items.
 - 13) Field observations.
 - 14) Status of RFIs.
 - 15) Status of proposal requests.
 - 16) Pending changes.
 - 17) Status of Change Orders.
 - 18) Pending claims and disputes.
 - 19) Documentation of information for payment requests.
4. Minutes: The Contractor is responsible for conducting the meeting and will record meeting minutes; incorporating detailed submittal, RFI, change order, etc. status reports prepared by the Contractor. The Contractor will distribute the meeting minutes to the Architect who will distribute to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 3100

SECTION 01 3200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's construction schedule.
 - 2. Construction schedule updating reports.
 - 3. Daily construction reports.
 - 4. Site condition reports.

1.2 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- C. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.

1.3 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file starting with the specification section number.
- B. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1.4 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than days, unless specifically allowed by Architect.
 - 2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
 - 4. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 6. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
- C. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE (GANTT CHART)

- A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's construction schedule within 30 days of date established for the Notice of Award.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.
 - 1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

2.3 REPORTS

- A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:
 - 1. List of subcontractors at Project site.
 - 2. Approximate count of personnel at Project site.
 - 3. Equipment at Project site.
 - 4. Material deliveries.

5. High and low temperatures and general weather conditions, including presence of rain or snow.
 6. Accidents.
 7. Meetings and significant decisions.
 8. Unusual events.
 9. Stoppages, delays, shortages, and losses.
 10. Meter readings and similar recordings.
 11. Emergency procedures.
 12. Orders and requests of authorities having jurisdiction.
 13. Change Orders received and implemented.
 14. Construction Change Directives received and implemented.
 15. Services connected and disconnected.
 16. Equipment or system tests and startups.
 17. Partial completions and occupancies.
 18. Substantial Completions authorized.
- B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 3. As the Work progresses, indicate final completion percentage for each activity.
- B. Distribution: Distribute copies of approved schedule to Architect Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 3200

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Sections:
 - 1. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require Owner's Consultant's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.
- B. Informational Submittals: Written and graphic information and physical samples that do not require Owner's Consultant's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.

1.4 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time requested for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time requested for making corrections or modifications to submittals noted by the Owner's Consultant and requested additional time for handling and reviewing submittals required by those corrections.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.

3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
 4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. Owner's Consultant/Engineer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
 - b. Owner's Consultant/Engineer reserves the right to withhold action on a submittal submitted out of sequence with the submittal schedule or the construction schedule critical path.
 - c. Owner's Consultant/Engineer reserves the right to withhold action on a submittal requiring color selection coordination with other submittals other color sensitive submittals until related submittals are received.
- B. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Owner's Consultant's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
1. Initial Review: Reference Article 6 of Document D for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Owner's Consultant will advise Contractor when a submittal being processed must be delayed for coordination.
 2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
 4. Sequential Review: Where sequential review of submittals by Owner's Consultant's consultants, Owner, or other parties is indicated, the review period will be extended.
 - a. All submittals will require sequential review by the Owner's Consultant and Owner.
- C. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.
1. Indicate name of firm or entity that prepared each submittal on label or title block.
 2. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Owner's Consultant.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.

- I. Other necessary identification.
- D. Identification and Information: Identify and incorporate information in each electronic submittal file as follows:
1. Assemble complete submittal package into a single indexed file with links enabling navigation to each item.
 2. Name file with submittal number, including revision identifier, and Section name.
 - a. File name shall use Specification Section number followed by a decimal point and then a sequential number, followed by the specification section name. (e.g., 061600.01 - Sheathing). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061600.01.A – Sheathing).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by Owner's Consultant.
 4. Include the following information on an inserted cover sheet:
 - a. Project name.
 - b. Date.
 - c. Name and address of Owner's Consultant.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Name of subcontractor.
 - g. Name of supplier.
 - h. Name of manufacturer.
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Related physical samples submitted directly.
 - m. Other necessary identification.
 5. Include the following information as keywords in the electronic file metadata:
 - a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- E. Options: Identify options requiring selection by the Owner's Consultant.
- F. Deviations: Identify deviations from the Contract Documents on submittals.
- G. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Owner's Consultant observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.
1. Submit additional copies as requested by Owner's Consultant for use in review and coordination of submittals.
 2. Additional copies for the contractor, subcontractors, vendors, suppliers and others, upon acceptance of submittals shall be the responsible of each. All copies shall be made from approved submittals showing project approval stamp and corresponding annotations.

- H. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Owner's Consultant will return submittals, without review, received from sources other than Contractor.
1. Transmittal Form: Provide locations on form for the following information:
 - a. Project name and number.
 - b. Date.
 - c. Destination (To:).
 - d. Source (From:).
 - e. Names of subcontractor, manufacturer, and supplier.
 - f. Category and type of submittal.
 - g. Submittal purpose and description.
 - h. Specification Section number and title.
 - i. Indication of full or partial submittal.
 - j. Drawing number and detail references, as appropriate.
 - k. Transmittal number, numbered consecutively.
 - l. Submittal and transmittal distribution record.
 - m. Remarks.
 - n. Signature of transmitter.
 2. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Owner's Consultant on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.
- I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.
1. Note date and content of previous submittal.
 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 3. Resubmit submittals until they are marked with approval notation from Owner's Consultant's action stamp.
- J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- K. Use for Construction: Use only final submittals that are marked with approval notation from Owner's Consultant's /Engineer's action stamp. Retain complete copies of submittals on Project Site.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Transmit electronic submittals as PDF electronic files directly to Owner's Consultant via e-mail.
 - a. Owner's Consultant will return electronic file in PDF format.
 2. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
 3. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a notarized statement on original paper copy certificates and certifications where indicated.
 4. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."
- B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.
1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
 2. Mark each copy of each submittal to show which products and options are applicable.
 3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
 4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
 5. Submit Product Data before or concurrent with Samples.
 6. Submit Product Data in the following format:
 - a. PDF electronic file.
- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.

- d. Notation of coordination requirements.
 - e. Notation of dimensions established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file.
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit one (1) full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Owner's Consultant will return submittal with options selected.
 5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit two sets of Samples. Owner's Consultant will retain one (1) Sample sets; remainder will be returned.
 - 1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.
 - 2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits of variations.

- E. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 - 1. Type of product. Include unique identifier for each product.
 - 2. Manufacturer and product name, and model number if applicable.
 - 3. Number and name of room or space.
 - 4. Location within room or space.
 - 5. Submit product schedule in the following format:
 - a. PDF electronic file.
- F. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."
- G. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of Owner's Consultants and owners, and other information specified.
- H. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- I. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- J. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- K. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- L. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- M. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- N. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.

4. Product and manufacturers' names.
 5. Description of product.
 6. Test procedures and results.
 7. Limitations of use.
- O. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."
- P. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- Q. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- R. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- S. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."
- T. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Owner's Consultant.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit digitally-signed PDF electronic file of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Owner's Consultant.
- B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name, number, and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 OWNER'S CONSULTANT'S ACTION

- A. General: Owner's Consultant will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: Owner's Consultant will review each submittal, make marks to indicate corrections or modifications required, and return it. Owner's Consultant will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action.
- C. Informational Submittals: Owner's Consultant will review each submittal and will not return it, or will return it if it does not comply with requirements. Owner's Consultant will forward each submittal to appropriate party.
- D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Owner's Consultant.
- E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.
- F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 013300

SECTION 01 5000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities include, but are not limited to, the following:
 - 1. Sewers and drainage.
 - 2. Water service and distribution.
 - 3. Sanitary facilities, including toilets, wash facilities, and drinking-water facilities.
 - 4. Heating and cooling facilities.
 - 5. Ventilation.
 - 6. Electric power service.
 - 7. Lighting.
 - 8. Telephone service.
- C. Support facilities include, but are not limited to, the following:
 - 1. Project identification and temporary signs.
 - 2. Waste disposal facilities.
 - 3. Field offices.
 - 4. Storage and fabrication sheds.
 - 5. Lifts and hoists.
 - 6. Temporary stairs.
 - 7. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Stormwater control.
 - 3. Tree and plant protection.
 - 4. Pest control.
 - 5. Site enclosure fence.
 - 6. Security enclosure and lockup.
 - 7. Barricades, warning signs, and lights.
 - 8. Covered walkways.
 - 9. Temporary enclosures.
 - 10. Temporary partitions.
 - 11. Fire protection.
- E. Related Sections include the following:
 - 1. Division 1 Section "Execution" for progress cleaning requirements.
 - 2. Division 31 Section "Termite Control" for pest control.

3. Divisions 2 through 34 for temporary heat, ventilation, and humidity requirements for products in those Sections.

1.3 DEFINITIONS

- A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to Owner or Architect and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 1. Owner's construction forces.
 2. Occupants of Project.
 3. Architect.
 4. Testing agencies.
 5. Personnel of authorities having jurisdiction.
- B. Water Service: Use water from Owner's existing water system without metering and without payment of use charges. Provide connections and extensions of service as required for construction operation.
- C. Electric Power Service: Electrical power from Owner's existing system is available for use without meters and without payment of use charges. Provide connections and extensions of service as required for construction operation.
- D. Should permanent systems not be available it is Contractor's responsibility to provide water and power.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
 2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible temporary egress: Comply with applicable provisions in the U.S. Architectural and Transportation Barriers Compliance Boards ADA-ABA accessibility guidelines

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, change over from use of temporary service to use of permanent service.
 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent

service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
1. Keep temporary services and facilities clean and neat.
 2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.
- B. Portable Chain-Link Fencing: Minimum 2-inch, 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide concrete or steel bases for supporting posts.
- C. Lumber and Plywood: Comply with requirements in Division 6 Section "Rough Carpentry."
- D. Gypsum Board: Minimum 5/8-inch thick by 48 inches wide by maximum available lengths; regular-type panels with tapered edges. Comply with ASTM C 36.
- E. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indices of 25 and 50, respectively.
- F. Paint: Comply with requirements in Division 9 Section "Painting."
- G. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- H. Water: Potable.

2.2 EQUIPMENT

- A. General: Provide equipment suitable for use intended.
- B. Field Offices: Mobile units with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.
- C. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

- E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.
- F. Heating Equipment: Unless Owner authorizes use of permanent heating system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.
 - 3. Verify temporary heating equipment fumes will not impair quality of finish installation. Damaged finishes due to heating fumes shall be removed and replaced at Contractors expense.
- G. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.
- H. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to Project site where Owner's easements cannot be used for that purpose.
- B. Sewers and Drainage: If sewers are available, provide temporary connections to remove effluent that can be discharged lawfully. If sewers cannot be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off-site in a lawful manner.
 - 1. Filter out excessive soil, construction debris, chemicals, oils, and similar contaminants that might clog sewers or pollute waterways before discharge.

2. Connect temporary sewers to municipal system or private system as directed by sewer department officials.
 3. Maintain temporary sewers and drainage facilities in a clean, sanitary condition. After heavy use, restore normal conditions promptly.
 4. Provide temporary filter beds, settlement tanks, separators, and similar devices to purify effluent to levels acceptable to authorities having jurisdiction.
- C. Water Service: Contractor will be responsible for all costs associated with connections to existing service. At project completion, restore these facilities to condition existing before initial use.
1. Provide rubber hoses as necessary to serve Project site.
 2. As soon as water is required, extend service to form a temporary water distribution system. Provide yard hydrant and hose bib connections so that all areas of new construction can be reached with a 100-foot hose.
 3. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 2. Toilets: Use of new construction toilet facilities will not be permissible. Install self-contained portable restroom units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
 3. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
 - a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
 4. Drinking-Water Facilities: Provide bottled-water, drinking-water units.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed.
1. Maintain a minimum temperature of 45 deg F in permanently enclosed portions of building for normal construction activities, and 55 deg F for finishing activities and areas where finished Work has been installed.
- F. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
 2. Provide warning signs at power outlets other than 110 to 120 V.
 3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
 4. Provide metal conduit enclosures or boxes for wiring devices.
 5. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations and traffic conditions.
1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
 2. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed.
- I. Telephone Service: Provide temporary telephone service throughout construction period for common-use facilities used by all personnel engaged in construction activities. Install separate telephone line for each field office and first-aid station. All telephone service will be at Contractor's expense.
1. At each telephone, post a list of important telephone numbers.
 - a. Police and fire departments.
 - b. Ambulance service.
 2. Provide an answering machine or voice-mail service on superintendent's telephone.
 3. Provide e-mail service for project superintendent.

3.3 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access.
 2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
 3. Maintain support facilities until near Substantial Completion. Remove at Substantial Completion. Personnel remaining after Substantial Completion will not be permitted to use permanent facilities, unless arrangements are made with the Owner's Representative.
- B. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes approved by the Owner. Install project identification sign where directed by the Architect to inform public and persons seeking entrance to Project. Provide directional signs at locations required to effectively direct traffic to or around construction site. Provide directional signs of similar construction and graphics to project sign or of standard painted metal and metal stakes. Signs shall be approximately 4 S.F. each. Do not permit installation of unauthorized signs.
- C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or

unsanitary waste materials separately from other waste. Comply with Division 1 Section "Execution" for progress cleaning requirements.

1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
- D. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.
1. All storage and fabrication structures must be pre approved by the Owner and Architect.
- E. Lifts and Hoists: Provide facilities for hoisting materials and personnel. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains.
- C. Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest-control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest-control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.
- D. Site Enclosure Fencing: Before construction operations begin, install portable chain-link enclosure fencing with lockable entrance gates. Locate to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.
1. Set fence posts in concrete or steel bases.
 2. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
 3. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with one set of keys.
- E. Security Enclosure and Lockup: Install substantial temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.
- F. Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

1. For safety barriers, sidewalk bridges, and similar uses, provide minimum 5/8-inch thick exterior plywood.
- G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
 3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
 4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
 5. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire-retardant-treated material for framing and main sheathing.
- H. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
 - a. Field Offices: Class A stored-pressure water-type extinguishers.
 - b. Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
 - c. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.
 2. Store combustible materials in containers in fire-safe locations.
 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
 4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
 5. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.
 6. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

- C. Temporary Facility Changeover: Except for using permanent fire protection, as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
 - 1. Materials and facilities that constitute temporary facilities are the property of Contractor.
 - 2. At Final Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section "Closeout Procedures."

END OF SECTION 01 5000

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SECTION 01 6000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled intact from other projects are not considered new products. New products can contain recycled raw materials.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
- b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

- B. Delivery and Handling:

- 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
- 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
- 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

- C. Storage:

- 1. Store products to allow for inspection and measurement of quantity or counting of units.
- 2. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- 3. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 4. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 5. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

- 1. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Refer to Divisions 02 through 49. Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
1. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 2. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:
1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.

5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 6000

SECTION 01 7300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Coordination of Owner-installed products.
 - 5. Progress cleaning.
 - 6. Starting and adjusting.
 - 7. Protection of installed construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect for visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
- B. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."
- E. Surface and Substrate Preparation: Comply with manufacturer's recommendations for preparation of substrates to receive subsequent work.

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.
- B. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
 - 1. Establish benchmarks and control points to set lines and levels of construction and elsewhere as needed to locate each element of Project.
 - 2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 90 inches in unoccupied spaces.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Final Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's construction personnel.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.
 - 1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually

agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.

3.7 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Utilize containers intended for holding waste materials of type to be stored.
 - 4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.
- B. Site: Maintain Project site free of waste materials and debris at all times. Keep site mowed to a maximum height of 6" at all times.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Final Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Final Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION 01 7300

SECTION 017329 - CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:
 - 1. Primary operational systems and equipment.
 - 2. Air or smoke barriers.
 - 3. Fire-suppression systems.
 - 4. Mechanical systems piping and ducts.
 - 5. Control systems.
 - 6. Communication systems.
 - 7. Conveying systems.
 - 8. Electrical wiring systems.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Miscellaneous elements include the following:
 - 1. Water, moisture, or vapor barriers.
 - 2. Membranes and flashings.
 - 3. Exterior curtain-wall construction.
 - 4. Equipment supports.
 - 5. Piping, ductwork, vessels, and equipment.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or

in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.5 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
 - 1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.

- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 - 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 - 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 - 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

END OF SECTION 017329

SECTION 01 7419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Construction waste shall be recycled at "Greenpoint C&D Processing Center" or approved equal. The district wants debris recycled, however, the project is NOT a LEED project so paperwork for that does NOT need to be submitted.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

3.2 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

3.3 RECYCLING CONSTRUCTION WASTE

- A. Packaging:
 - 1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
 - 2. Polystyrene Packaging: Separate and bag materials.
 - 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
 - 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

3.4 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.
 - 1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn waste materials.
- C. Disposal: Remove waste materials and dispose of at designated spoil areas on Owner's property.

END OF SECTION 01 7419

SECTION 01 7700 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Final completion procedures.
 - 2. Warranties.
 - 3. Final cleaning.

1.3 FINAL COMPLETION

- A. Final Procedures: Before requesting inspection for determining date of Final Completion, complete the following. List items below that are incomplete with request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 3. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 4. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
 - 5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 6. Complete startup testing of systems.
 - 7. Submit test/adjust/balance records.
 - 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 9. Advise Owner of changeover in heat and other utilities.
 - 10. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 11. Complete final cleaning requirements, including touchup painting.
 - 12. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
 - 13. Submit a final Application for Payment according to the General Conditions of the Contract.
 - 14. Submit certified copy of Architect's Final Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 - 15. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

16. Submit completed Final Commissioning Report.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST) BY CONTRACTOR

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.
 1. Organize list of spaces in sequential order, starting with exterior areas first.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Contractor.
 - d. Page number.
 4. Submit list of incomplete items in the following format:
 - a. PDF electronic file.

1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Final Completion is indicated.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.
- D. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Final Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

- 1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.
- m. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
- n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
- o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
- p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
- q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.
 - 1) Clean HVAC system in compliance with NADCA Standard 2005 edition. Provide written report upon completion of cleaning.
- r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
- s. Leave Project clean and ready for occupancy.

END OF SECTION 01 7700

SECTION 01 7823 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 013300 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect and will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.

2. Two paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
 - D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect and Commissioning Authority will return copy with comments.
 1. Correct or revise each manual to comply with Architect's and Commissioning Authority's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's and Commissioning Authority's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 1. List of documents.
 2. List of systems.
 3. List of equipment.
 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:

1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. Performance and design criteria if Contractor has delegated design responsibility.
 3. Operating standards.
 4. Operating procedures.
 5. Operating logs.
 6. Wiring diagrams.

7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Manufacturer's name.
3. Color, pattern, and texture.
4. Material and chemical composition.
5. Reordering information for specially manufactured products.

- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.
 - 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 - 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 - 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - 1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared record Drawings in Section 017839 "Project Record Documents."

- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 7823

SECTION 01 7839 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Specifications.
 - 3. Record Product Data.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit two set(s) of marked-up record prints.
- B. Record Specifications: Submit two paper copies of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit two paper copies of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding archive photographic documentation.
 - 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.

- b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made following Architect's written orders.
 - k. Details not on the original Contract Drawings.
 - l. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as paper copy.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders, record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as paper copy.
 - 1. Include record Product Data directory organized by specification section number and title, electronically linked to each item of record Product Data.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

END OF SECTION 01 7839

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SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

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

1.4 INFORMATIONAL SUBMITTALS

A. Predemolition Photographs or Video: Submit before Work begins.

B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection. Indicate proposed locations and construction of barriers.

C. Schedule of Selective Demolition Activities: Indicate the following:

1. Interruption of utility services. Indicate how long utility services will be interrupted.
2. Coordination for shutoff, capping, and continuation of utility services.
3. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

1.5 CLOSEOUT SUBMITTALS

- A. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.6 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.
- D. Hazardous Materials: Hazardous materials are present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present. An Environmental Inspection Report is attached to the end of this specification for reference.
 - 1. The Contractor shall properly remove, haul and dispose of any hazardous materials encountered in compliance with all applicable regulations of local, state, and federal authorities having jurisdiction.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

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

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- D. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 011000 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 PREPARATION

- A. 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. Comply with requirements for access and protection specified in Section 015000 "Temporary Facilities and Controls."

- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

3.4 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 5. Dispose of demolished items and materials promptly. Comply with requirements of Section 017419 "Construction and Demolition Materials Recycling Requirements"
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.

3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- B. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

3.7 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 024119

SELECTIVE DEMOLITION

024119 - 4

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

1. Steel framing and supports for equipment.
2. Slotted channel framing.
3. Shelf angles.

- B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.
2. Anchor bolts, steel pipe sleeves, slotted-channel inserts, and wedge-type inserts indicated to be cast into concrete or built into unit masonry.
3. Steel weld plates and angles for casting into concrete for applications where they are not specified in other Sections.

1.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

- C. ACTION SUBMITTALS

- D. Product Data: For the following:

1. Fasteners.
2. Shop primers.
3. Shrinkage-resisting grout.
4. Slotted channel framing.

- E. Shop Drawings: Show fabrication and installation details.[Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Steel framing and supports for mechanical and electrical equipment.
2. Loose steel lintels.

1.4 QUALITY ASSURANCE

- A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

1.5 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls, floor slabs, decks, and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.
 - 1. Temperature Change: 180 deg F, material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.
- C. Steel Tubing: ASTM A500/A500M, cold-formed steel tubing.
- D. Steel Pipe: ASTM A53/A53M, Standard Weight (Schedule 40) unless otherwise indicated.
- E. Slotted Channel Framing: Cold-formed metal box channels (struts) complying with MFMA-4.
 - 1. Size of Channels: As indicated.
 - 2. Material: Cold-rolled steel, ASTM A1008/A1008M, [commercial steel, Type B] [structural steel, Grade 33]; 0.0677-inch minimum thickness; unfinished .

2.3 FASTENERS

- A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.
- B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

- C. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.
 - 1. Hot-dip galvanize or provide mechanically deposited, zinc coating where item being fastened is indicated to be galvanized.
- D. Anchors, General: Capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing in accordance with ASTM E488/E488M, conducted by a qualified independent testing agency.
- E. Cast-in-Place Anchors in Concrete: Either threaded or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.
- F. Post-Installed Anchors:
 - 1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, unless otherwise indicated.
 - 2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy [Group 1] [Group 2] stainless steel bolts, ASTM F593, and nuts, ASTM F594.
- G. Slotted-Channel Inserts: Cold-formed, hot-dip galvanized-steel box channels (struts) complying with MFMA-4, 1-5/8 by 7/8 inches by length indicated with anchor straps or studs not less than 3 inches long at not more than 8 inches o.c. Provide with temporary filler and tee-head bolts, complete with washers and nuts, all zinc-plated to comply with ASTM B633, Class Fe/Zn 5, as needed for fastening to inserts.

2.4 MISCELLANEOUS MATERIALS

- A. Shop Primers: Provide primers that comply with Section 099113 "Exterior Painting," Section 099123 "Interior Painting," and Section 078123 "Intumescent Fireproofing"
- B. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Shrinkage-Resistant Grout: Factory-packaged, nonmetallic, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- F. Concrete: Comply with requirements in Section 033000 "Cast-in-Place Concrete" for normal-weight, air-entrained concrete with a minimum 28-day compressive strength of 3000 psi.

2.5 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing[and contour of welded surface matches that of adjacent surface].
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.6 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

2.7 LOOSE BEARING AND LEVELING PLATES

- A. Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction. Drill plates to receive anchor bolts and for grouting.
- B. Galvanize bearing and leveling plates.
- C. Prime plates with zinc-rich primer.

2.8 LOOSE STEEL LINTELS

- A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.
- B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inches unless otherwise indicated.
- C. Galvanize loose steel lintels located in exterior walls.

2.9 GENERAL FINISH REQUIREMENTS

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.10 STEEL AND IRON FINISHES

- A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.
 - 2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLATION OF MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 INSTALLATION OF BEARING AND LEVELING PLATES

- A. Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of plates.
- B. Set bearing and leveling plates on wedges, shims, or leveling nuts. After bearing members have been positioned and plumbed, tighten anchor bolts. Do not remove wedges or shims but, if protruding, cut off flush with edge of bearing plate before packing with shrinkage-resistant grout. Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

3.4 REPAIRS

- A. Touchup Painting:
 - 1. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

- a. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
2. Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in [Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."
- B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055000

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Wood blocking, cants, and nailers.
 - 2. Plywood backing panels.

1.3 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimension Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Lumber grading agencies, and abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NLGA: National Lumber Grades Authority.
 - 3. SPIB: The Southern Pine Inspection Bureau.
 - 4. WCLIB: West Coast Lumber Inspection Bureau.
 - 5. WWPA: Western Wood Products Association.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
 - 1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D5664.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Reports: For the following, from ICC-ES:
 - 1. Wood-preservative-treated wood.
 - 2. Fire-retardant-treated wood.
 - 3. Power-driven fasteners.

4. Powder-actuated fasteners.
5. Metal framing anchors.

1.6 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 1. Factory mark each piece of lumber with grade stamp of grading agency.
 2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
 3. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content of Lumber:
 1. Dimension Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.2 PRESERVATIVE TREATMENT

- A. Preservative Treatment by Pressure Process: AWWA U1; Use Category UC2 for interior construction not in contact with ground, Use Category UC3b for exterior construction not in contact with ground, and Use Category UC4a for items in contact with ground.
 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium. Do not use inorganic boron (SBX) for sill plates.
 2. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
 3. After treatment, redry boards, dimension lumber to 19 percent maximum moisture content.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- D. Application: Treat all rough carpentry unless otherwise indicated.

2.3 FIRE-RETARDANT TREATMENT

- A. General: Where fire-retardant-treated materials are indicated, materials shall comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested according to ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Treatment shall not promote corrosion of metal fasteners.
 - 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D2898. Use for exterior locations and where indicated.
 - 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
 - 4. Design Value Adjustment Factors: Treated lumber shall be tested according to ASTM D5664 and design value adjustment factors shall be calculated according to ASTM D6841. For enclosed roof framing, framing in attic spaces, and where high temperature fire-retardant treatment is indicated, provide material with adjustment factors of not less than 0.85 modulus of elasticity and 0.75 for extreme fiber in bending for Project's climatological zone.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
 - 1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece.
- E. For exposed items indicated to receive a stained or natural finish, chemical formulations shall not bleed through, contain colorants, or otherwise adversely affect finishes.
- F. Application: Treat all rough carpentry unless otherwise indicated.

2.4 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.
- B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:
 - 1. Hem-fir (north); NLGA.
 - 2. Mixed southern pine or southern pine; SPIB.
 - 3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed southern pine or southern pine; No. 2 grade; SPIB.
 - 2. Hem--fir or hem-fir (north); Construction or No. 2 Common grade; NLGA, WCLIB, or WWPA.
 - 3. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWPA.

- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.
- E. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.
- F. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.5 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 1/2-inch nominal thickness.

2.6 FASTENERS

- A. General: Fasteners shall be of size and type indicated and shall comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A153/A153M or ASTM F2329.
 - 2. For pressure-preservative-treated wood, use stainless steel fasteners.
 - 3. For redwood, use stainless steel or hot-dip galvanized-steel fasteners.
- B. Nails, Brads, and Staples: ASTM F1667.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Lag Bolts: ASME B18.2.1.
- E. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.
- F. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry accurately to other construction. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
- D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.

- E. Install sill sealer gasket/termite barrier in accordance with manufacturer's written instructions at the underside of wall bottom track or rim track and at the top of foundation wall or slab at stud or joist locations.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - 1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches o.c.
- H. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:
 - 1. Fire block furred spaces of walls, at each floor level, at ceiling, and at not more than 96 inches o.c. with solid wood blocking or noncombustible materials accurately fitted to close furred spaces.
 - 2. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.
 - 3. Fire block concealed spaces between floor sleepers with same material as sleepers to limit concealed spaces to not more than 100 sq. ft. and to solidly fill space below partitions.
 - 4. Fire block concealed spaces behind combustible cornices and exterior trim at not more than 20 feet o.c.
- I. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- J. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
- K. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- L. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
 - 3. ICC-ES evaluation report for fastener.
- M. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- N. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 - 1. Comply with indicated fastener patterns where applicable. Before fastening, mark fastener locations, using a template made of sheet metal, plastic, or cardboard.

2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 INSTALLATION OF WOOD BLOCKING AND NAILERS

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 INSTALLATION OF WOOD FURRING

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- size furring as indicated on the drawings.
- C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- size furring as indicated on the drawings.

3.4 PROTECTION

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

END OF SECTION 061000

SECTION 064116 - PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Plastic-laminate-clad architectural cabinets.
 - 2. Cabinet hardware and accessories.
 - 3. Wood furring, blocking, shims, and hanging strips for installing plastic-laminate-clad architectural cabinets that are not concealed within other construction.
- B. Related Requirements:
 - 1. Section 061000 "Rough Carpentry" Section 061053 "Miscellaneous Rough Carpentry" for wood furring, blocking, shims, and hanging strips required for installing cabinets that are concealed within other construction before cabinet installation.
 - 2. Section 123661.16 "Solid Surface Countertops."

1.3 COORDINATION

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to support loads imposed by installed and fully loaded cabinets.
- B. Hardware Coordination: Distribute copies of approved hardware schedule specified in Section 087100 "Door Hardware" to manufacturer of architectural cabinets; coordinate Shop Drawings and fabrication with hardware requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified, in manufacturer's or manufacturer's standard size.
- C. Samples for Verification: For the following:
 - 1. Plastic Laminates: 8 by 10 inches, for each type, color, pattern, and surface finish required.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.

1.6 CLOSEOUT SUBMITTALS

- A. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Employs skilled workers who custom fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
 - 1. Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program.

- B. Installer Qualifications: Licensed participant in AWI's Quality Certification Program.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver cabinets until painting and similar finish operations that might damage architectural cabinets have been completed in installation areas. Store cabinets in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.9 FIELD CONDITIONS

- A. Environmental Limitations without Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
- B. Environmental Limitations with Humidity Control: Do not deliver or install cabinets until building is enclosed, wet-work is complete, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.
- C. Field Measurements: Where cabinets are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
 - 1. Locate concealed framing, blocking, and reinforcements that support cabinets by field measurements before being enclosed/concealed by construction, and indicate measurements on Shop Drawings.
- D. Established Dimensions: Where cabinets are indicated to fit to other construction, establish dimensions for areas where cabinets are to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

PART 2 - PRODUCTS

2.1 ARCHITECTURAL CABINET MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. CMC Millwork of Topeka, Kansas
 - a. 785-232-1234
 - 2. Highland Millshop of Topeka, Kansas
 - a. 785-232-9328
 - 3. Bob Florence of Topeka, Kansas
 - a. 785-352-0341

2.2 PLASTIC-LAMINATE-CLAD ARCHITECTURAL CABINETS

- A. Quality Standard: Unless otherwise indicated, comply with the Architectural Woodwork Standards for grades of cabinets indicated for construction, finishes, installation, and other requirements.
 - 1. Provide labels from AWI certification program indicating that woodwork and installation complies with requirements of grades specified.
- B. Architectural Woodwork Standards Grade: Custom.
- C. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or if not indicated, as required by quality standard.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. Formica Corporation.
- b. Pionite; a Panolam Industries International, Inc. brand.
- c. Wilsonart LLC.

D. Laminate Cladding for Exposed Surfaces:

1. Horizontal Surfaces: Grade HGS.
2. Postformed Surfaces: Grade HGP.
3. Vertical Surfaces: Grade VGS.
4. Edges: 3MM PVC edge banding, 1/8-inch thick, matching laminate in color, pattern, and finish.
5. Pattern Direction: Vertically for drawer fronts, doors, and fixed panels.

E. Materials for Semiexposed Surfaces:

1. Surfaces Other Than Drawer Bodies: Thermoset decorative panels.
2. Edges of Plastic-Laminate Shelves: PVC edge banding, 1/8-inch thick, matching laminate in color, pattern, and finish.
 - a. Edges of Thermoset Decorative Panel Shelves: PVC or polyester edge banding.
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, NEMA LD 3, Grade VGS.
3. Drawer Sides and Backs: Thermoset decorative panels with PVC or polyester edge banding.
4. Drawer Bottoms: Thermoset decorative panels.

F. Concealed Backs of Panels with Exposed Plastic-Laminate Surfaces: High-pressure decorative laminate, NEMA LD 3, Grade BKL.

G. Drawer Construction: Fabricate with exposed fronts fastened to subfront with mounting screws from interior of body.

1. Join subfronts, backs, and sides with glued rabbeted joints supplemented by mechanical fasteners .

H. Colors, Patterns, and Finishes: Colors to be selected by Architect from Manufacturer's full range of colors, patterns, and standard finishes.

2.3 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. Wood Moisture Content: 5 to 10 percent.

B. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of architectural cabinet and quality grade specified unless otherwise indicated.

1. Thermoset Decorative Panels: Particleboard or MDF finished with thermally fused, melamine-impregnated decorative paper and complying with requirements of NEMA LD 3, Grade VGL, for Test Methods 3.3, 3.4, 3.6, 3.8, and 3.10.

2.4 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets except for items specified in Section 087100 "Door Hardware."

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Accuride International.
 - b. Hardware Resources.

- c. Knappe & Vogt Manufacturing Company.
 - d. Promark
 - e. Hafele
 - f. A&M Hardware.
- B. Butt Hinges: 2-3/4-inch, five-knuckle steel hinges made from 0.095-inch- thick metal, and as follows:
- 1. Semiconcealed Hinges for Overlay Doors: ANSI/BHMA A156.9, B01521.
 - 2. Basis of Design: Promark 5 Knuckle Overlay Hinges #DSPROIH76 – 26D.
- C. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter.
- 1. Basis of Design: Hafele 4" Satin Chrome Wire Pull #116.07.427
- D. Catches: 15lb Magnetic catches, ANSI/BHMA A156.9, B03141.
- E. Support Brackets: Countertop support angle, Color: TBD.
- 1. Basis of Design: A&M Hardware 1,000 lbs load
- F. Adjustable Shelf Standards and Supports: ANSI/BHMA A156.9, B04071; with shelf rests, B04081.
- G. Shelf Rests: ANSI/BHMA A156.9, B04013; plastic.
- 1. Basis of Design: Hafele 5mm Heavy-Duty Shelf Pins Clear #282.47.402
- H. Drawer Slides: ANSI/BHMA A156.9.
- 1. Grade 1 and Grade 2: Side mounted and extending under bottom edge of drawer.
 - a. Type: Full extension.
 - b. Material: Zinc-plated steel with polymer rollers.
 - 2. Grade 1HD-100 and Grade 1HD-200: Side mounted; full-overtravel-extension type; zinc-plated-steel ball-bearing slides.
 - 3. For drawers not more than 3 inches high and not more than 24 inches wide, provide Grade 1.
 - 4. For drawers more than 3 inches high, but not more than 6 inches high and not more than 24 inches wide, provide Grade 1HD-100.
 - 5. For drawers more than 6 inches high or more than 24 inches wide, provide Grade 1HD-200.
- I. Door Locks: ANSI/BHMA A156.11, E07121.
- J. Drawer Locks: ANSI/BHMA A156.11, E07041.
- K. Door and Drawer Silencers: ANSI/BHMA A156.16, L03011.
- L. Grommets for Cable Passage: 2-inch OD, molded-plastic grommets and matching plastic caps with slot for wire passage.
- 1. Basis of Design: Hafele Cable Grommets #631.26.301
 - 2. Color: TBD.
- M. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with ANSI/BHMA A156.18 for ANSI/BHMA finish number indicated.
- 1. Satin Chromium Plated: ANSI/BHMA 626 for brass or bronze base; ANSI/BHMA 652 for steel base.
 - 2. Satin Stainless Steel: ANSI/BHMA 630.
- N. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in ANSI/BHMA A156.9.
- 2.5 MISCELLANEOUS MATERIALS
- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesive for Bonding Plastic Laminate: Woodworkers Choice.
 - 1. Adhesive for Bonding Edges: Hot-melt adhesive.

2.6 FABRICATION

- A. Fabricate architectural cabinets to dimensions, profiles, and details indicated.
- B. Complete fabrication, including assembly and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.
- C. Shop-cut openings to maximum extent possible to receive hardware, appliances, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition cabinets to humidity conditions in installation areas for not less than 72 hours.

3.2 INSTALLATION

- A. Architectural Woodwork Standards Grade: Install cabinets to comply with quality standard grade of item to be installed.
- B. Assemble cabinets and complete fabrication at Project site to extent that it was not completed in the shop.
- C. Anchor cabinets to anchors or blocking built in or directly attached to substrates. Secure with wafer-head cabinet installation screws.
- D. Install cabinets level, plumb, and true in line to a tolerance of 1/8 inch in 96 inches using concealed shims.
 - 1. Scribe and cut cabinets to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
 - 2. Install cabinets without distortion so doors and drawers fit openings and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
 - 3. Fasten wall cabinets through back, near top and bottom, and at ends not more than 16 inches o.c. with No. 10 wafer-head sheet metal screws through metal backing or metal framing behind wall finish.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective cabinets, where possible, to eliminate functional and visual defects. Where not possible to repair, replace architectural cabinets. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean cabinets on exposed and semiexposed surfaces.

END OF SECTION 064116

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes
 1. glass-fiber blanket insulation
 2. acoustical insulation
- B. Related Sections:
 1. Division 09 Section(s) for installation in wood and metal-framed assemblies of insulation specified by referencing this Section.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each product.

1.5 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.

1.7 GLASS-FIBER BLANKET INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. CertainTeed Corporation.
 2. Guardian Building Products, Inc.
 3. Johns Manville.
 4. Owens Corning.
 5. Hunter

- B. Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.
- C. Foil-Faced, Glass-Fiber Blanket, Unfaced: ASTM C 665, Type III (reflective faced), Class B (faced surface with a flame-propagation resistance of 0.12 W/sq. cm.); Category 1 (membrane is a vapor barrier, faced with foil scrim, foil-scrim kraft, or foil-scrim polyethylene).
- D. Where glass-fiber blanket insulation is indicated by the following thicknesses, provide blankets in batt or roll form with thermal resistances indicated:
 - 1. 3-5/8 inches thick with a thermal resistance of 13 deg F x h x sq. ft./Btu at 75 deg F.
 - 2. 5-1/2 inches thick with a thermal resistance of 19 deg F x h x sq. ft./Btu at 75 deg F.
 - 3. 6-1/2 inches thick with a thermal resistance of 21 deg F x h x sq. ft./Btu at 75 deg F.
 - 4. 10 inches thick with a thermal resistance of 30 deg F x h x sq. ft./Btu at 75 deg F.
- E. Sustainability Requirements: Provide glass-fiber blanket insulation as follows:
 - 1. Free of Formaldehyde: Insulation manufactured with 100 percent acrylic binders and no formaldehyde.
 - 2. Low Emitting: Insulation tested according to ASTM D 5116 and shown to emit less than 0.05-ppm formaldehyde.
- F. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.

1.8 SAFING INSULATION

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Fibrex Insulations Inc.
 - 2. Owens Corning.
 - 3. Roxul Inc.
 - 4. Johns Manville.
- B. Unfaced, Mineral-Wool Blanket Insulation: ASTM C 665, Type I (blankets without membrane facing); consisting of fibers; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively, per ASTM E 84; passing ASTM E 136 for combustion characteristics.

1.9 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 - 1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 8.
 - 2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 45, respectively, per ASTM E 84.

1.10 INSULATION FASTENERS

- A. Adhesively Attached, Spindle-Type Anchors: Plate welded to projecting spindle; capable of holding insulation of specified thickness securely in position indicated with self-locking washer in place.
 - 1. Products: Subject to compliance with requirements, provide one of the following:

- a. AGM Industries, Inc.; Series T TACTOO Insul-Hangers.
 - b. Gemco; Spindle Type.
2. Plate: Perforated, galvanized carbon-steel sheet, 0.030 inch thick by 2 inches square.
 3. Spindle: Copper-coated, low-carbon steel; fully annealed; 0.105 inch in diameter; length to suit depth of insulation indicated.
- B. Anchor Adhesive: Product with demonstrated capability to bond insulation anchors securely to substrates indicated without damaging insulation, fasteners, and substrates.
1. Products: Subject to compliance with requirements, provide one of the following:
 - a. AGM Industries, Inc.; TACTOO Adhesive.
 - b. Gemco; Tuff Bond Hanger Adhesive.

PART 2 - EXECUTION

2.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

2.2 INSTALLATION OF CAVITY-WALL INSULATION

- A. Foam-Plastic Board Insulation: Install pads of adhesive spaced approximately 24 inches o.c. both ways on inside face, and as recommended by manufacturer. Fit courses of insulation between wall ties and other obstructions, with edges butted tightly in both directions. Press units firmly against inside substrates.
 1. Supplement adhesive attachment of insulation by securing boards with two-piece wall ties designed for this purpose and specified in Division 04 Section "Unit Masonry."

2.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Glass-Fiber or Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.

3. For metal-framed wall cavities where cavity heights exceed 96 inches, support un-faced blankets mechanically and support faced blankets by taping flanges of insulation to flanges of metal studs.

2.4 PROTECTION

- A. Protect installed insulation from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 072100

SECTION 07 8413 - PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Penetrations in fire-resistance-rated walls.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Product Schedule and Assembly Shop Drawings: For each penetration firestopping system assembly. Include location and design designation of qualified testing and inspecting agency.
 - 1. Each application submitted shall be accurately marked to show the actual test/listed assembly to be provided, including the construction surrounding the penetration, sleeves, firestopping products and associated materials, and any options allowed and selected under the tested/listed assembly. The marking shall not use color highlighting and the data shall be marked to indicate materials and assembly options not applicable, by marking out such non-applicable (non-proposed) requirements, while still having the marked out item readable through the strike-out. If the submitted application is copied directly from a UL directory illustration or similar publication with small format lettering, enlarge the copy to be readable from a distance of 12 inches without magnification to the Architect's satisfaction.
 - 2. Where Project conditions require modification to a qualified testing and inspecting agency's illustration for a particular penetration firestopping condition, submit illustration, with modifications marked, approved by penetration firestopping manufacturer's fire-protection engineer as an engineering judgment or equivalent fire-resistance-rated assembly.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Installer Certificates: From Installer indicating penetration firestopping has been installed in compliance with requirements and manufacturer's written recommendations.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for penetration firestopping.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FM Global according to FM Global 4991, "Approval of Firestop Contractors," or been evaluated by UL and found to comply with its "Qualified Firestop Contractor Program Requirements."
- B. Fire-Test-Response Characteristics: Penetration firestopping shall comply with the following requirements:
 - 1. Penetration firestopping tests are performed by a qualified testing agency acceptable to authorities having jurisdiction.
 - 2. Penetration firestopping is identical to those tested per testing standard referenced in "Penetration Firestopping" Article. Provide rated systems complying with the following requirements:
 - a. Penetration firestopping products bear classification marking of qualified testing and inspecting agency.
 - b. Classification markings on penetration firestopping correspond to designations listed by the following:
 - 1) UL in its "Fire Resistance Directory."

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install penetration firestopping when ambient or substrate temperatures are outside limits permitted by penetration firestopping manufacturers or when substrates are wet because of rain, frost, condensation, or other causes.
- B. Install and cure penetration firestopping per manufacturer's written instructions using natural means of ventilations or, where this is inadequate, forced-air circulation.

1.7 COORDINATION

- A. Coordinate construction of openings and penetrating items to ensure that penetration firestopping is installed according to specified requirements.
- B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate penetration firestopping.
- C. Notify contractor's testing agency at least seven days in advance of penetration firestopping installations; confirm dates and times on day preceding each series of installations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. A/D Fire Protection Systems Inc.
 - 2. Grace Construction Products.

3. Hilti, Inc.
4. Johns Manville.
5. NUCO Inc.
6. Passive Fire Protection Partners.
7. Specified Technologies Inc.
8. 3M Fire Protection Products.
9. Tremco, Inc.; Tremco Fire Protection Systems Group.
10. USG Corporation.

2.2 PENETRATION FIRESTOPPING

- A. Provide penetration firestopping that is produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated. Penetration firestopping systems shall be compatible with one another, with the substrates forming openings, and with penetrating items if any.
- B. Penetrations in Fire-Resistance-Rated Walls: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg (2.49 Pa).
 1. Fire-resistance-rated walls include fire-barrier walls.
 2. F-Rating: Not less than the fire-resistance rating of constructions penetrated.
- C. Penetrations in Horizontal Assemblies: Provide penetration firestopping with ratings determined per ASTM E 814 or UL 1479, based on testing at a positive pressure differential of 0.01-inch wg.
 1. Horizontal assemblies include floors, roofs, and ceiling membranes of rated ceiling assemblies.
 2. F-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated.
 3. T-Rating: At least 1 hour, but not less than the fire-resistance rating of constructions penetrated except for floor penetrations within the cavity of a wall.
- D. Penetrations in Smoke Barriers: Provide penetration firestopping with ratings determined per UL 1479.
 1. L-Rating: Not exceeding 5.0 cfm/sq.ft. of penetration opening at 0.30-inch wg at both ambient and elevated temperatures.
- E. W-Rating: Provide penetration firestopping showing no evidence of water leakage when tested according to UL 1479.
- F. Exposed Penetration Firestopping: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- G. VOC Content: Penetration firestopping sealants and sealant primers shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 1. Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.

- H. Low-Emitting Materials: Penetration firestopping sealants and sealant primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- I. Accessories: Provide components for each penetration firestopping system that are needed to install fill materials and to maintain ratings required. Use only those components specified by penetration firestopping manufacturer and approved by qualified testing and inspecting agency for firestopping indicated.
 - 1. Permanent forming/damming/backing materials, including the following:
 - a. Slag-wool-fiber or rock-wool-fiber insulation.
 - b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
 - c. Fire-rated form board.
 - d. Fillers for sealants.
 - 2. Temporary forming materials.
 - 3. Substrate primers.
 - 4. Collars.
 - 5. Steel sleeves.

2.3 FILL MATERIALS

- A. Cast-in-Place Firestop Devices: Factory-assembled devices for use in cast-in-place concrete floors and consisting of an outer metallic sleeve lined with an intumescent strip, a radial extended flange attached to one end of the sleeve for fastening to concrete formwork, and a neoprene gasket.
- B. Latex Sealants: Single-component latex formulations that do not re-emulsify after cure during exposure to moisture.
- C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.
- D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized-steel sheet.
- E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
- F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
- G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.
- H. Pillows/Bags: Use of Pillows/Bags is not acceptable.
- I. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

- J. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants 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 sloped surfaces, unless indicated firestopping limits use of nonsag grade for both opening conditions.

2.4 MIXING

- A. For those products requiring mixing before application, comply with penetration firestopping manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean out openings immediately before installing penetration firestopping to comply with manufacturer's written instructions and with the following requirements:
 - 1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of penetration firestopping.
 - 2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with penetration firestopping. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent penetration firestopping from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove stains. Remove tape as soon as possible without disturbing firestopping's seal with substrates.

3.3 INSTALLATION

- A. General: Install penetration firestopping to comply with manufacturer's written installation instructions and published drawings for products and applications indicated.

- B. Install forming materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
 - 1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestopping.
- C. Install fill materials for firestopping by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
 - 2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
 - 3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 IDENTIFICATION

- A. Identify penetration firestopping with preprinted metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of firestopping edge so labels will be visible to anyone seeking to remove penetrating items or firestopping. Use mechanical fasteners or self-adhering-type labels with adhesives capable of permanently bonding labels to surfaces on which labels are placed. Include the following information on labels:
 - 1. The words "Warning - Penetration Firestopping - Do Not Disturb. Notify Building Management of Any Damage."
 - 2. Contractor's name, address, and phone number.
 - 3. Designation of applicable testing and inspecting agency.
 - 4. Date of installation.
 - 5. Manufacturer's name.
 - 6. Installer's name.

3.5 FIELD QUALITY CONTROL

- A. Engage a qualified testing agency to perform tests and inspections.
- B. Where deficiencies are found or penetration firestopping is damaged or removed because of testing, repair or replace penetration firestopping to comply with requirements.
- C. Proceed with enclosing penetration firestopping with other construction only after inspection reports are issued and installations comply with requirements.

3.6 CLEANING AND PROTECTION

- A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved in writing by penetration firestopping manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure that penetration firestopping is without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, immediately cut out and remove damaged or deteriorated penetration firestopping and install new materials to produce systems complying with specified requirements.

END OF SECTION 07 8413

SECTION 078443 – JOINT FIRESTOPPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes fire-resistive joint systems for the following:
 - 1. Joints in or between fire-resistance-rated constructions.
 - 2. Joints in smoke barriers.
- B. Related Sections include the following:
 - 1. Division 07 Section "Penetration Firestopping" for systems installed in openings in walls and floors with and without penetrating items.
 - 2. Division 07 Section "Joint Sealants" for non-fire-resistive joint sealants.

1.3 PERFORMANCE REQUIREMENTS

- A. General: Provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assembly in which fire-resistive joint systems are installed.
- B. Joint Systems in and between Fire-Resistance-Rated Constructions: Provide systems with assembly ratings equaling or exceeding the fire-resistance ratings of construction that they join, and with movement capabilities and L-ratings indicated as determined by UL 2079.
 - 1. Load-bearing capabilities as determined by evaluation during the time of test.
- C. For fire-resistive systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each fire-resistive joint system, show each kind of construction condition in which joints are installed; also show relationships to adjoining construction. Include fire-resistive joint system design designation of testing and inspecting agency acceptable to authorities having jurisdiction that demonstrates compliance with requirements for each condition indicated.
 - 1. Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each fire-resistive joint system configuration for construction and penetrating items.
- C. Product Certificates: For each type of fire-resistive joint system, signed by product manufacturer.

- D. Qualification Data: For Installer.
- E. Evaluation Reports: Evidence of fire-resistive joint systems' compliance with ICBO ES AC30, from the ICBO Evaluation Service.
- F. Research/Evaluation Reports: For each type of fire-resistive joint system.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A firm that has been approved by FMG according to FMG 4991, "Approval of Firestop Contractors."
- B. Installation Responsibility: Assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single qualified installer.
- C. Source Limitations: Obtain fire-resistive joint systems, for each kind of joint and construction condition indicated, through one source from a single manufacturer.
- D. Fire-Test-Response Characteristics: Provide fire-resistive joint systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:
 - 1. Fire-resistance tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL or another agency performing testing and follow-up inspection services for fire-resistive joint systems acceptable to authorities having jurisdiction.
 - 2. Fire-resistive joint systems are identical to those tested per methods indicated in Part 1 "Performance Requirements" Article and comply with the following:
 - a. Fire-resistive joint system products bear classification marking of qualified testing and inspecting agency.
 - b. Fire-resistive joint systems correspond to those indicated by referencing system designations of the qualified testing and inspecting agency.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver fire-resistive joint system products to Project site in original, unopened containers or packages with qualified testing and inspecting agency's classification marking applicable to Project and with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials for fire-resistive joint systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install fire-resistive joint systems when ambient or substrate temperatures are outside limits permitted by fire-resistive joint system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
- B. Ventilate fire-resistive joint systems per manufacturer's written instructions by natural means or, if this is inadequate, forced-air circulation.

1.8 COORDINATION

- A. Coordinate construction of joints to ensure that fire-resistive joint systems are installed according to specified requirements.
- B. Coordinate sizing of joints to accommodate fire-resistive joint systems.

PART 2 - PRODUCTS

2.1 FIRE-RESISTIVE JOINT SYSTEMS

- A. Where required, provide fire-resistive joint systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which fire-resistive joint systems are installed. Fire-resistive joint systems shall accommodate building movements without impairing their ability to resist the passage of fire and hot gases.
- B. Joints in or between Fire-Resistance-Rated Construction: Provide fire-resistive joint systems with ratings determined per ASTM E 1966 or UL 2079.
 - 1. Joints include those installed in or between fire-resistance-rated walls floor or floor/ceiling assemblies and roofs or roof/ceiling assemblies.
 - 2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of construction they will join.
 - 3. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A/D Fire Protection Systems Inc.
 - b. CEMCO.
 - c. Fire Trak Corp.
 - d. Grace Construction Products.
 - e. Hilti, Inc.
 - f. Johns Manville.
 - g. Nelson Firestop Products.
 - h. NUCO Inc.
 - i. Passive Fire Protection Partners.
 - j. RectorSeal Corporation.
 - k. Specified Technologies Inc.
 - l. 3M Fire Protection Products.
 - m. Tremco, Inc.; Tremco Fire Protection Systems Group.
 - n. USG Corporation.
- C. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079.
 - 1. L-Rating: Not exceeding 5.0 cfm/ft of joint at 0.30 inch wg at both ambient and elevated temperatures.
 - 2. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. A/D Fire Protection Systems Inc.
 - b. Grace Construction Products.
 - c. Hilti, Inc.
 - d. Johns Manville.
 - e. Nelson Firestop Products.
 - f. NUCO Inc.
 - g. Passive fire Protection Partners.

- h. RectorSeal Corporation.
 - i. Specified Technologies Inc.
 - j. 3M Fire Protection Products.
 - k. Tremco, Inc.; Tremco Fire Protection Systems Group
 - l. USG Corporation.
- D. Exposed Fire-Resistive Joint Systems: Provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.
- E. VOC Content: Fire-resistive joint system sealants shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
- 1. Architectural Sealants: 250 g/L.
 - 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 - 3. Sealant Primers for Porous Substrates: 775 g/L.
- F. Compatibility: Provide fire-resistive joint systems that are compatible with joint substrates, under conditions of service and application, as demonstrated by fire-resistive joint system manufacturer based on testing and field experience.
- G. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by fire-resistive joint system manufacturer and approved by the qualified testing and inspecting agency for systems indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for joint configurations, substrates, and other conditions affecting performance of work.
- 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning: Clean joints immediately before installing fire-resistive joint systems to comply with fire-resistive joint system manufacturer's written instructions and the following requirements:
- 1. Remove from surfaces of joint substrates foreign materials that could interfere with adhesion of fill materials.
 - 2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with fill materials. Remove loose particles remaining from cleaning operation.
 - 3. Remove laitance and form-release agents from concrete.
- B. Priming: Prime substrates where recommended in writing by fire-resistive joint system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
- C. Masking Tape: Use masking tape to prevent fill materials of fire-resistive joint system from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from fire-resistive joint system materials. Remove tape as soon as possible

without disturbing fire-resistive joint system's seal with substrates or damaging adjoining surfaces.

3.3 INSTALLATION

- A. General: Install fire-resistive joint systems to comply with Part 1 "Performance Requirements" Article and fire-resistive joint system manufacturer's written installation instructions for products and applications indicated.
- B. Install forming/packing/backing materials and other accessories of types required to support fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
- C. Install fill materials for fire-resistive joint systems by proven techniques to produce the following results:
 - 1. Fill voids and cavities formed by openings and forming/packing/backing materials as required to achieve fire-resistance ratings indicated.
 - 2. Apply fill materials so they contact and adhere to substrates formed by joints.
 - 3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 CLEANING AND PROTECTING

- A. Clean off excess fill materials adjacent to joints as Work progresses by methods and with cleaning materials that are approved in writing by fire-resistive joint system manufacturers and that do not damage materials in which openings occur.
- B. Provide final protection and maintain conditions during and after installation that ensure fire-resistive joint systems are without damage or deterioration at time of Substantial Completion. If damage or deterioration occurs despite such protection, cut out and remove damaged or deteriorated fire-resistive joint systems immediately and install new materials to produce fire-resistive joint systems complying with specified requirements.

END OF SECTION 078446

SECTION 07 9200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Latex joint sealants.
- B. Related Sections:
 - 1. Division 09 Section "Gypsum Board" for sealing perimeter joints.

1.3 PRECONSTRUCTION TESTING

- A. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
 - 1. Use ASTM C 1087 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
 - 2. Submit not fewer than eight pieces of each kind of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
 - 3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
 - 4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
 - 5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.
- B. Preconstruction Stain Testing, Silicone Sealants: Submit to joint sealant manufacturer for silicone sealants to be used in masonry, stone, and similar porous joints, the actual joint materials for testing in accordance with ASTM C124B, to determine whether the sealants to be used will cause staining of the surrounding joint materials. Schedule sufficient time for testing and analyzing results to prevent delaying the Work. For sealant materials failing tests, obtain joint sealant manufacturer' written requirements for the products and procedures to be used to result in no staining.

1.4 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.

3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Certificates: For each kind of joint sealant and accessory, from manufacturer.
- C. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
- D. Preconstruction Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
 1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
 2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain each kind of joint sealant from single source from single manufacturer.
- C. Product Testing: Test joint sealants using a qualified testing agency.
 1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
 2. Test according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

1.7 PROJECT CONDITIONS

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

1.8 WARRANTY

- A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 1. Warranty Period: Two years from date of Final Completion.
- B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not

comply with performance, including non-staining of adjacent materials, and other requirements specified in this Section within specified warranty period.

- C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Disintegration of joint substrates from natural causes exceeding design specifications.
 3. Mechanical damage caused by individuals, tools, or other outside agents.
 4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. **Compatibility:** Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
- B. **VOC Content of Interior Sealants:** Sealants and sealant primers used inside the weatherproofing system shall comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
1. Architectural Sealants: 250 g/L.
 2. Sealant Primers for Nonporous Substrates: 250 g/L.
 3. Sealant Primers for Porous Substrates: 775 g/L.
- C. **Liquid-Applied Joint Sealants:** Comply with ASTM C 920 and other requirements indicated for each liquid-applied joint sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- D. **Stain-Test-Response Characteristics:** Where sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- E. **Suitability for Contact with Food:** Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.
- F. **Colors of Exposed Joint Sealants:** As selected by Architect from manufacturer's full range.

2.2 SILICONE JOINT SEALANTS

- A. **Mildew-Resistant, Single-Component, Nonsag, Neutral-Curing Silicone Joint Sealant ES-3:** ASTM C 920, Type S, Grade NS, Class 25, for Use NT.
1. **Products:** Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; 898.
 - b. Tremco; Tremsil 600 White.

2.3 LATEX JOINT SEALANTS

- A. **Latex Joint Sealant LS-1:** Acrylic latex or siliconized acrylic latex, ASTM C 834, Type OP, Grade NF.

1. Products: Subject to compliance with requirements, provide one of the following:
 - a. Pecora Corporation; AC-20+.
 - b. Tremco Incorporated; Tremflex 834.

2.4 JOINT SEALANT BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) or Type B (bicellular material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning

operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
 - b. Masonry.
3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
- B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:
1. Place sealants so they directly contact and fully wet joint substrates.
 2. Completely fill recesses in each joint configuration.
 3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.
- F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile per Figure 8A in ASTM C 1193, unless otherwise indicated.

4. Provide flush joint profile where indicated per Figure 8B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 8C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

- A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

- A. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal nontraffic surfaces (LS-1).
 1. Joint Locations:
 - a. Perimeter joints between millwork and existing construction.
 - b. Control and expansion joints on exposed interior surfaces of exterior walls.
 - c. Perimeter joints of exterior openings where indicated.
 - d. Vertical joints on exposed surfaces of interior unit masonry walls and partitions.
 - e. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
 2. Joint Sealant: Latex.
 3. Joint-Sealant Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION 07 9200

SECTION 08 1113 - HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Standard hollow metal frames.

B. Related Sections:

1. Division 09 Sections "Metal Framing" and "Gypsum Board" for all framing and finish.
2. Division 09 Section "Interior Painting" for field painting hollow metal frames.

1.2 DEFINITIONS

- A. Minimum Thickness: Minimum thickness of base metal without coatings.

- B. Standard Hollow Metal Work: Hollow metal work fabricated according to ANSI/SDI A250.8.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes.

B. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of each different wall opening condition.
6. Details of anchorages, joints, field splices, and connections.
7. Details of accessories.
8. Details of moldings, removable stops, and glazing.
9. Details of conduit and preparations for power, signal, and control systems.
10. Fire rated doors and frames showing conformance with NFPA 80 and Underwriters Laboratory, Inc.

C. Other Action Submittals:

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

1.4 INFORMATIONAL SUBMITTALS

- A. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each type of hollow metal door and frame assembly.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain hollow metal work from single source from single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use nonvented plastic.
 - 1. Provide additional protection to prevent damage to finish of factory-finished units.
- B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.
- C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch- (102-mm-) high wood blocking. Do not store in a manner that traps excess humidity.
 - 1. Provide minimum 1/4-inch (6-mm) space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.8 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Amweld Building Products, LLC.
 - 2. Ceco Door Products; an Assa Abloy Group company.
 - 3. Curries Company; an Assa Abloy Group company.
 - 4. Fleming Door Products Ltd.; an Assa Abloy Group company.
 - 5. Steelcraft; an Ingersoll-Rand company.
 - 6. Mesker

2.2 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- D. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
 - 1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.
- F. Grout: ASTM C 476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C 143/C 143M.
- G. Glazing: Comply with requirements in Division 08 Section "Glazing."
- H. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15-mil (0.4-mm) dry film thickness per coat. Provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.

2.3 STANDARD HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. Interior Frames: Fabricated from cold-rolled steel sheet unless metallic-coated sheet is indicated.
 - 1. Fabricate frames with mitered or coped corners.
 - 2. Fabricate frames as full profile welded unless otherwise indicated.
 - 3. Frames for Level 3 Steel Doors: 0.067-inch- (1.7-mm-) thick steel sheet. 0.075-inch- (1.9-mm) for frames exceeding 48 inches in width.
 - 4. Frames for Wood Doors: 0.067-inch- (1.7-mm-) thick steel sheet. 0.075-inch- (1.9-mm) for frames exceeding 48 inches in width.
 - 5. Frames for Borrowed Lights: 0.067-inch- (1.7-mm-) thick steel sheet. 0.075-inch- (1.9-mm) for frames exceeding 48 inches in width.
- C. Knocked Down frames are not acceptable.
- D. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 with reinforcement plates from same material as frames.

2.4 FRAME ANCHORS

- A. Jamb Anchors:

1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:
 1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 2. Where floor fills occur, provide extension type floor anchors to compensate for depth of fill.
 3. At bottom of jamb use 1.3mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive two 6 mm (1/4 inch) floor bolts. Use 50 mm x 50 mm (2 inch by 2 inch) 9 mm by (3/8 inch) clip angle for lead lined frames, drilled for 9 mm (3/8 inch) floor bolts.
 4. Where mullions occur, provide 2.3 mm thick steel channel anchors, drilled for 6mm floor bolts and frame anchor screws.
 5. Where sill sections occur, provide continuous 1 mm thick steel rough bucks drilled for 6mm floor bolts and frame anchor screws. Space floor bolts at 50mm (24 inches) on center.

2.5 STOPS AND MOLDINGS

- A. Moldings for Glazed Lites in Doors: Minimum 0.032 inch (0.8 mm) thick, fabricated from same material as door face sheet in which they are installed.
- B. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated.

2.6 ACCESSORIES

- A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.
- B. Ceiling Struts: Minimum 1/4-inch-thick by 1-inch- (6.4-mm-thick by 25.4-mm-) wide steel.
- C. Grout Guards: Formed from same material as frames, not less than 0.016 inch (0.4 mm) thick.
- D. Grout Boxes: Formed from same materials as frames at locations indicated to receive installation of electrical conduit for power or data wiring.

2.7 FABRICATION

- A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.
- B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.
- C. Hollow Metal Frames: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
 1. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible.

2. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
 3. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated.
 4. Grout Guards: Weld guards to frame at back of hardware mortises in frames to be grouted.
 5. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.
 - a. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 - b. Where floor fills occur, provide extension type floor anchors to compensate for depth of fill.
 - c. At bottom of jamb use 1.3mm (0.053 inch) thick steel clip angles welded to jamb and drilled to receive two 6 mm (1/4 inch) floor bolts. Use 50 mm x 50 mm (2 inch by 2 inch) 9 mm by (3/8 inch) clip angle for lead lined frames, drilled for 9 mm (3/8 inch) floor bolts.
 6. Jamb Anchors: Provide number and spacing of anchors as follows:
 - 1) Stud-Wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:
 - a) Three anchors per jamb up to 60 inches high.
 - b) Four anchors per jamb from 60 to 90 inches high.
 - c) Five anchors per jamb from 90 to 96 inches high.
 - d) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
 - e) Two anchors per head for frames above 42 inches wide and mounted in metal-stud partitions.
 7. Door Silencers: Except on weather-stripped doors, drill stops to receive door silencers as follows. Keep holes clear during construction.
 - a. Single-Door Frames: Drill stop in strike jamb to receive three door silencers.
 - b. Double-Door Frames: Drill stop in head jamb to receive two door silencers.
- D. Fabricate concealed stiffeners, edge channels, and hardware reinforcement from either cold- or hot-rolled steel sheet.
- E. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware."
1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
 2. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.
 3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
 4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.
- F. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints.
1. Single Glazed Lites: Provide fixed stops and moldings welded on secure side of hollow metal work.

2. Provide fixed frame moldings on outside of exterior and on secure side of interior doors and frames.
3. Provide loose stops and moldings on inside of hollow metal work.
4. Coordinate rabbet width between fixed and removable stops with type of glazing and type of installation indicated.

2.8 STEEL FINISHES

- A. Prime Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.
 1. Shop Primer: Manufacturer's standard, fast-curing, lead- and chromate-free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; compatible with substrate and field-applied coatings despite prolonged exposure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.
- B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the following tolerances:
 1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.
- C. Drill and tap doors and frames to receive nontemplated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

- A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.
- B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.
 - 1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
 - a. At fire-protection-rated openings, install frames according to NFPA 80.
 - b. Where frames are fabricated in sections because of shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
 - c. Install frames with removable glazing stops located on secure side of opening.
 - d. Install door silencers in frames before grouting.
 - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
 - f. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
 - g. Field apply bituminous coating to backs of frames that are filled with grout containing antifreezing agents.
 - 2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with postinstalled expansion anchors.
 - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
 - 3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
 - 4. Ceiling Struts: Extend struts vertically from top of frame at each jamb to overhead structural supports or substrates above frame unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction. Provide adjustable wedged or bolted anchorage to frame jamb members.
 - 5. Installation Tolerances: Adjust hollow metal door frames for squareness, alignment, twist, and plumb to the following tolerances:
 - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
 - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
 - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
 - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.4 ADJUSTING AND CLEANING

- A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

- B. Remove grout and other bonding material from hollow metal work immediately after installation.
- C. Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying, rust-inhibitive primer.
- D. Metallic-Coated Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

END OF SECTION 08 1113

SECTION 081433 - STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Related Requirements:

1. Section 064214 "Stile and Rail Wood Paneling" for requirements for veneers from the same flitches for both wood paneling and stile and rail wood doors.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Interior fire-rated stile and rail wood doors.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each type of door; construction details not covered in Product Data, including those for stiles, rails, panels, and moldings (sticking); and other pertinent data, including the following:

1. Door schedule indicating door location, type, size, fire protection rating, and swing.
2. Door elevations, dimensions and location of hardware, lite locations, and glazing thickness.
3. Details of frame for each frame type, including dimensions and profile.
4. Details of electrical raceway and preparation for electrified hardware, access control systems, and security systems.
5. Dimensions and locations of mortises and holes for hardware.
6. Clearances and undercuts.
7. Requirements for veneer matching.
8. Doors to be factory finished and application requirements.
9. Apply AWI Quality Certification Program label to Shop Drawings.

C. Samples for Initial Selection: For factory-finished doors.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality control reports.

B. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS.

A. Special warranties.

B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

C. Record Documents: For fire-rated doors, list of door numbers and applicable room name and number to which door accesses.

1.5 QUALITY ASSURANCE

- A. Manufacturer's Certification: Licensed participant in AWI's Quality Certification Program.
- B. Fire-Rated Door Inspector Qualifications: Inspector for field quality control inspections of fire-rated door assemblies must meet the qualifications set forth in NFPA 80, Section 5.2.3.1 and the following:
 - 1. Door and Hardware Institute Fire and Egress Door Assembly Inspector (FDAI) certification.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package doors individually in opaque plastic bags or cardboard cartons.
- C. Mark each door on top and bottom rail with opening number used on Shop Drawings.

1.7 FIELD CONDITIONS

- A. Environmental Limitations:
 - 1. Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature and relative humidity levels designed for building occupants for the remainder of construction period.
 - 2. Do not deliver or install doors until building is enclosed and weathertight, wet work is complete and dry, and HVAC system is operating and maintaining temperature between 60 and 90 deg F and relative humidity between 43 and 70 percent during remainder of construction period.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace doors and frames that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Delamination of veneer.
 - b. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - c. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty must also include installation and finishing that may be required due to repair or replacement of defective doors and frames.
 - 3. Warranty must be in effect during specified period of time from date of Substantial Completion.
 - 4. Warranty Period for Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain stile and rail wood doors from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Rated Wood Door and Frame Assemblies: Complying with NFPA 80 that are listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for fire-protection ratings indicated on Drawings, based on testing at positive pressure in accordance with NFPA 252.
- B. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control by a qualified testing agency acceptable to authorities having jurisdiction, based on testing in accordance with UL 1784 and installed in compliance with NFPA 105.

2.3 MATERIALS

- A. Use only materials that comply with referenced standards and other requirements specified.
 - 1. Assemble exterior doors, including components, with wet-use adhesives complying with ASTM D5572 for finger joints and with ASTM D5751 for joints other than finger joints.
 - 2. Assemble interior doors, including components, with either dry-use or wet-use adhesives complying with ASTM D5572 for finger joints and with ASTM D5751 for joints other than finger joints.
- B. Panel Products: Any of the following unless otherwise indicated:
 - 1. Particleboard: ANSI A208.1, Grade M-2.
 - 2. Medium-density fiberboard (MDF), complying with ANSI A208.2, Grade 130.
 - 3. Hardboard complying with ANSI A135.4.
 - 4. Veneer-core plywood.

2.4 STILE AND RAIL WOOD DOOR FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels unless otherwise indicated:
 - 1. Clearances:
 - a. Provide 1/8 inch at heads, jambs, and between pairs of doors.
 - b. Provide 1/2 inch from bottom of door to top of decorative floor finish or covering.
 - c. Where threshold is shown on Drawings or scheduled, provide not more than 3/8 inch from bottom of door to top of threshold.
 - d. Comply with NFPA 80 requirements for fire-rated doors.
 - 2. Bevel non-fire-rated doors 1/8 inch in 2 inches at lock and hinge edges.
 - 3. Bevel fire-rated doors 1/8 inch in 2 inches on lock edge; trim stiles and rails only to extent permitted by labeling agency.

- B. Factory machine doors for hardware that is not surface applied.
 - 1. Locate hardware to comply with DHI-WDHS-3.
 - 2. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
 - 3. For doors scheduled to receive electrified locksets, provide factory-installed raceway and wiring to accommodate specified hardware.
 - 4. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

2.5 FACTORY FINISHING

- A. Comply with referenced quality standard for factory finishing.
 - 1. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 2. Finish faces, all four edges, edges of cutouts, and mortises.
 - 3. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Finish: Rotary Natural Birch, stain and finish.
 - 1. Match existing adjacent door species and cut.
- C. Factory finish doors.
- D. Transparent Finish:
 - 1. Architectural Woodwork Standards Grade: Custom.
 - a. System 11, Polyurethane, Catalyzed.
 - 2. WDMA I.S. 6A Grade: Custom.
 - a. TR-6 Catalyzed Polyurethane.
 - 3. Staining: As selected by Architect from manufacturer's full range.
 - 4. Effect: Open-grain finish.
 - 5. Sheen: Match Existing adjacent doors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
 - 1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 087100 "Door Hardware."
- B. Install doors and frames to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated door frames in accordance with NFPA 80.
 - a. Install frames level, plumb, true, and straight.
 - 1) Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches.
 - b. Anchor frames to anchors or blocking built in or directly attached to substrates.
 - 1) Secure with countersunk, concealed fasteners and blind nailing.
 - 2) Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork.
 - c. For shop-finished items, use filler matching finish of items being installed.
 - 2. Install fire-rated doors in accordance with NFPA 80.
- C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory- Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 FIELD QUALITY CONTROL

- A. Inspections:
 - 1. Provide inspection of installed Work through AWI's Quality Certification Program, certifying that woodwork, including installation, complies with requirements of the Architectural Woodwork Standards for the specified grade.
 - 2. Fire-Rated Door Inspections: Inspect each fire-rated door in accordance with NFPA 80, Section 5.2.
- B. Repair or remove and replace installations where inspections indicate that they do not comply with specified requirements.
- C. Reinspect repaired or replaced installations to determine if replaced or repaired door installations comply with specified requirements.
- D. Prepare and submit separate inspection report for each fire-rated door assembly indicating compliance with each item listed in NFPA 101.

3.4 ADJUSTING

- A. Operation: Rehang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors

may be repaired or refinished if Work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081433

SECTION 087100 - DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Intent: The intent of this Section is to provide finish hardware for the proper operation and control of all wood, hollow metal, and aluminum doors in the Project. Prior to bidding, notify the Architect of any doors that do not have hardware meeting this intention.
- B. Section Includes: Provide all items of finish hardware required to adequately trim, hang, and operate all doors, as is hereinafter specified and listed in the Hardware Schedule.
 - 1. The hardware supplier will be responsible to furnish correct hardware on labeled doors to satisfy State and Local Building Codes.
 - 2. Should items of hardware, not definitely specified, be required for completion of work, furnish such items of type and quality suitable to the services required and comparable to the adjacent hardware.
 - 3. Provide all necessary standard and special fasteners, screws, bolts, expansion shields or anchors to properly secure hardware to its intended door, frame, or other surface.
- C. Related Sections include the following:
 - 1. Hollow Metal Doors and Frames: Section 08 11 13.
 - 2. Flush Wood Doors: Section 08 14 16.
 - 3. Aluminum Framed Entrances and Storefronts: Section 08 41 13.
- D. This Section includes, but is not necessarily limited to furnishing and installing complete, the following:
 - 1. Finish hardware for proper operation, function, control and protection of all doors, as required.

1.2 REFERENCES

- A. The following reference standards and model code documents shall be used in estimating and detailing door hardware, and shall be considered as a standard of quality, function, and performance, as applicable:
 - 1. I.B.C. 2015 Edition.
 - 2. NFPA-80 Fire Doors & Windows (current year adopted).
 - 3. NFPA-101 Life Safety Code (current year adopted).
 - 4. NFPA-105 Smoke Control Door Assembly. (current year adopted)
 - 5. ANSI-117.1 2009 Edition Providing Accessibility and Usability for Physically Handicapped People.
 - 6. A.D.A.A.G Guidelines. Americans with Disabilities Act Accessibility

1.3 ACTION SUBMITTALS

- A. General: Submit the following in accordance with Section 01 33 00.
- B. Product Data: Provide a catalog cut sheet, clearly marked and identified, illustrating and describing each product included in the Hardware Schedule.
 - 1. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
 - 2. Formulate catalog cut sheets into sets and include a set with each copy of the Hardware Schedule submitted.

- C. Door Hardware Schedule: Prepared by or under the supervision of Architectural Hardware Consultant, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
 - 2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening.
 - 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Complete designations of every item required for each door or opening including name and manufacturer.
 - c. Fastenings and other pertinent information.
 - d. Location of each door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule. Use same scheduling sequence and format and use same door numbers and hardware set numbers as in the Contract Documents.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Description of each electrified door hardware function, including location, sequence of operation, and interface with other building control systems.
 - 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other Work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- D. Samples for Verification: If so requested by the Architect, provide a sample of any product or item requested, properly marked and tagged, for the opening for which it is intended.
- E. Keying: Submit separate detailed schedule indicating keying for all locks. Keying schedule must be approved by the Owner prior to ordering any permanent cylinders.

1.4 INFORMATIONAL SUBMITTALS

- A. Operation and Maintenance Data: For each type of door hardware to include in maintenance manuals. Provide latest, revised and updated schedule of finish hardware, complete with catalog cuts and keying schedule. In addition, furnish one (1) copy of maintenance and parts manuals for those items for which they are readily available and normally provided.
 - 1. Submit in accordance with provisions of Section 01 78 23.

1.5 QUALITY ASSURANCE

- A. Substitutions: Request for substitutions for alternative hardware items will not be accepted on this Project unless specifically indicated. If any specified product is listed as a "No Substitution" product, only that specified product shall be provided as indicated.
- B. Installer Qualifications: An experienced installer who has completed door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- C. Supplier Qualifications: Door hardware supplier with warehousing facilities in Project's vicinity and who is or employs a qualified Architectural Hardware Consultant, available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1. The hardware supplier shall be engaged regularly in the furnishing, delivery and servicing of contract builder's hardware and must be experienced and knowledgeable in all phases of estimating, detailing, scheduling, masterkeying, shipping and installation practices.
 2. When electro-mechanical or electronic hardware is supplied, a qualified individual with a minimum five- (5) year's experience shall be available for assistance.
- D. Architectural Hardware Consultant Qualifications: A person who is currently certified by the Door and Hardware Institute as an Architectural Hardware Consultant and who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project.
- E. Source Limitations: Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- F. Regulatory Requirements: Comply with provisions of the following:
1. Provide hardware that complies with Americans with Disabilities Act (ADA), "Accessibility Guidelines for Buildings and Facilities (ADAAG)," and ANSI A117.1.
- G. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to NFPA 252.
- H. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Marking and Packaging: All items of hardware shall be delivered to the site in manufacturer's original cartons or boxes. Mark each box with hardware heading and door number according to approved hardware schedule.
 - B. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation: Provide a complete packing list showing items, door numbers and hardware headings with each shipment.
 - C. Store hardware in shipping cartons above ground and under cover to prevent damage. Provide secure lockup for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items that are not immediately replaceable -so that completion of the Work will not be delayed by hardware losses both before and after installation
 - D. Aluminum Door Hardware: Deliver hardware for aluminum doors as directed by the door supplier.
- 1.7 COORDINATION
- A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
 - B. Electrical System Roughing-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system, and building control system, as applicable.
 - C. Existing Openings: Where hardware components are scheduled for application to existing construction or where modifications to existing door hardware are required, field verify existing conditions and coordinate installation of door hardware to suit opening conditions and to provide proper door operation.

1.8 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. Maintenance Service: If there are any products listed hereinafter that normally require a maintenance or service contract, provide the Owner and Architect with details and costs of standard maintenance or service contract.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
 - 1. Provide the materials or products indicated by trade names, manufacturer's name, or catalog number.
 - 2. Provide manufacturer's standard products meeting the design intent of this Specification, free of imperfections affecting appearance or serviceability.
 - 3. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.

2.2 SPECIAL REQUIREMENTS

- A. Hinges:
 - 1. Provide non-removable pins for all exterior doors. Use nonrising pins for all other doors.
 - 2. Provide heavy weight hinges unless otherwise specified.
- B. Locksets:
 - 1. Locksets to be grade 1 heavy duty mortise unless otherwise specified.
 - 2. Match lever design of existing facility.
- C. Closers:
 - 1. Comply with manufacturer's recommendations for unit size based on door size, weather exposure and usage.
 - 2. Closer shall be UL Certified to be in compliance with UBC 7.2 and UL 10C.
 - 3. Closers with Pressure Relief Values will not be acceptable.
 - 4. Provide brackets or plates required for proper Installation of door closers.
- D. Automatic Operators:
 - 1. Standard: BHMA A156.19.
 - 2. Manual operation of the door without power assistance, permitting the continued use of the door in the event the operator mechanism fails.
 - 3. Second Chance Feature: When an obstruction or resistance to the opening swing is encountered the operator will pause at that point, and then attempt to continue opening the door. If the obstruction or resistance remains, the operator will again pause the door.
 - 4. Operator shall contain a microprocessor to control all motor and clutch functions.
 - 5. Activation Device: Provide illuminated actuators displaying lock condition. Locate in accordance with Architect.
- E. Stops
 - 1. Provide heavy duty and concealed or surface mounted overhead stop or holder for interior doors as specified. Provide overhead stop for interior doors that swing more than opens against equipment, casework, sidelights, and where conditions do not allow wall stop.
- F. Thresholds and Gasketing

1. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items.
2. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
3. Gasketing and astragals on aluminum frames by door manufacturer
4. Smoke seal and intumescent seal is to be provided as required on fire labeled openings.

G. Silencers

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

H. Special Notes

1. Coordinate hardware locations with vision light sizes and locations.

2.3 MATERIALS

- A. Screws and Fasteners: Provide all screws and fasteners of the proper size and type to properly anchor or attach the item of hardware scheduled. Provide all fasteners with Phillips heads, unless security type screws (spanner-head or torx-head) are hereinafter specified.

2.4 HARDWARE PRODUCTS

ITEM	SPECIFIED	APPROVED EQUAL
Hinges	Ives	Bommer, Stanley
Locksets	Schlage L Series	Sargent 8200, Falcon MA
Closers	Von Duprin 98 Series	Sargent 80
Closers	LCN 4040XP Series	Sargent 281
Auto Operators	Dorma ED100	No Substitution
Flatgoods	Ives	Burns, Rockwood
Stops	Ives	Burns, Rockwood
Overhead Stops	Glynn Johnson	Rixson
Thresholds	Zero	NGP, Reese
Weatherstrip	Zero	NGP, Reese

2.5 FINISHES

- A. Provide matching finishes for hardware units at each door to the greatest extent possible, unless otherwise indicated. In general, match items to the finish for the latch, lock or push pull unit for color and texture.
- B. Hardware finishes as follows:
1. 626 - Satin Chrome-plated.
 2. 630 – Satin Stainless Steel

2.6 KEYING

- A. Keying of locks and cylinders throughout project shall be scheduled through a key meeting with Architect, Owner, and hardware supplier. Key schedule shall be prepared and submitted to the Owner for approval. Copies of final key schedule with the bitting instructions shall be submitted as part of the Project Record Documents.
- B. Locks shall be keyed to the existing restricted key system. Keying Schedule must be approved by the Owner prior to ordering any locks.
- C. Key all locks separately, or alike, as directed by the Owner's Representative and Architect.

- D. Bitting list: Provide keying transcript list to Owner's representative in printed or electronic form as directed by Owner.
- E. Provide keys as follows:
 - 1. Change Keys: 2 per lock.
 - 2. Master Keys: 6 required (per system).
- F. Identification: Stamp all (master-type) keys with the following:
 - 1. Do Not Duplicate.
 - 2. Key change number (all keys).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Steel Doors and Frames: Comply with DHI A115 series.
 - 1. Surface-Applied Door Hardware: Drill and tap doors and frames according to SDI 107 or ANSI A250.6, whichever is more stringent.
- B. Wood Doors: Comply with DHI A115-W series.

3.3 INSTALLATION

- A. Installation shall be by a qualified installer with a minimum five (5) years experience in the installation of commercial grade hardware. Manufacturer's instructions shall dictate templating and installation.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
- C. Prior to hardware installation, the General Contractor shall setup a meeting with the Hardware Supplier and the Hardware installer to ensure the installer has and understands the manufacturers installation requirements for all hardware items
- D. Install each door hardware item to comply with manufacturer's written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 09 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
 - 1. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.
 - 2. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

- E. Key Control System: Place keys on markers and hooks in key control system cabinet, as determined by final keying schedule.
- F. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings. Verify location with Architect prior to installation.
- G. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

3.4 FIELD QUALITY CONTROL

- A. Perform final inspection with hardware installer and hardware supplier present to ensure correct installation and operation, and check for any damaged or defective items. Observe and inspect that all hardware has been installed to its correct destination in proper working order.
- B. Independent Architectural Hardware Consultant: Owner reserves the right to engage a qualified independent Architectural Hardware Consultant to perform a separate independent inspection and to prepare an inspection report.

3.5 ADJUSTING

- A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended.
 - 1. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
 - 3. Door Closers: Adjust door closers immediately upon installation. Adjust in exact conformance with manufacturer's printed instructions. Advance backcheck to eliminate shock at dead stop. Set closer latching speed to assure unassisted positive latching.
 - a. Degree of swing of door for self-limiting closers shall be maximum available.
 - 4. Adjust all exit devices immediately upon installation. Adjust in exact conformance with manufacturers' printed instructions.
 - 5. Seal weather protection components attached to the exterior sides of doors and frames, such as drip caps and weather-stripping, in place with clear silicone caulk in such a manner as to ensure a continuously filled seam throughout the joinery.
 - 6. Cut and fit weatherstripping accurately to provide the greatest possible continuity of the contact element. Adjust closer template as required.
- B. At completion of the installation and prior to Substantial Completion, make final adjustments to door closures and other items of hardware. Leave all hardware clean and fully operable. Should any item be found to be defective, it shall be repaired or replaced as directed.
- C. Occupancy Adjustment: Approximately three months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust, including adjusting operating forces, each item of door hardware as necessary to ensure function of doors, door hardware, and electrified door hardware.

3.6 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation.
- B. Clean operating items as necessary to restore proper function and finish.
- C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.7 DEMONSTRATION

- A. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.
- B. After hardware is installed and adjusted, the Supplier shall inspect the job with the Architect and the General contractor to determine if the hardware is functioning properly

3.8 HARDWARE SCHEDULE

- A. The hardware sets listed below represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process.

HARDWARE SET: 01

DOOR NUMBER:

179B

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC EXIT HARDWARE	RX-LC-QEL-99-L-NL-06-CON24VDC	626	VON
2	EA	CYLINDER	VERIFY TYPE REQUIRED		SAR
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	GASKETING	488SBK PSA	BK	ZER
2	EA	WIRE HARNESS	CON (VERIFY LENGTH REQUIRED)		VD
1	EA	DOOR CONTACT	679-05HM		SC
1	EA	POWER SUPPLY	BY INTEGRATOR		
1	EA	CARD READER	BY INTEGRATOR		

OPERATION: PULL SIDE. DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ, WHICH UNLOCKS AND OPENS DOORS. PUSH SIDE: DOOR NORMALLY CLOSED AND UNLOCKED. PUSHING PUSH PAD OPENS DOOR FOR FREE EGRESS AT ALL TIMES.

HARDWARE SET: 02

DOOR NUMBER:

179C

EACH TO HAVE:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1HW 4.5 X 4.5	652	IVE
1	EA	POWER TRANSFER	EPT10 CON	689	VON
1	EA	ELEC EXIT HARDWARE	RX-LC-QEL-99-L-NL-06-CON24VDC	626	VON
2	EA	CYLINDER	VERIFY TYPE REQUIRED		SAR
1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
1	EA	GASKETING	PEMKOSTCSET-1	BK	PE
1	EA	SILL PLATE	324 X DOOR WIDTH	AL	PE
2	EA	WIRE HARNESS	CON (VERIFY LENGTH REQUIRED)		VD
1	EA	DOOR CONTACT	679-05HM		SC
1	EA	POWER SUPPLY	BY INTEGRATOR		
1	EA	CARD READER	BY INTEGRATOR		

OPERATION: PULL SIDE. DOOR NORMALLY CLOSED AND LOCKED. ACCESS VIA VALID CARD READ, WHICH UNLOCKS AND OPENS DOORS. PUSH SIDE: DOOR NORMALLY CLOSED AND UNLOCKED. PUSHING PUSH PAD OPENS DOOR FOR FREE EGRESS AT ALL TIMES.

END OF SECTION

SECTION 092216 - NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Non-load-bearing steel framing systems for interior partitions.
 - 2. Floor Anchor

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

- A. Evaluation reports for firestop tracks.

PART 2 - PRODUCTS

2.1 FRAMING SYSTEMS

- A. Framing Members, General: Comply with ASTM C 754 for conditions indicated.
 - 1. Steel Sheet Components: Comply with ASTM C 645 requirements for metal unless otherwise indicated.
 - 2. Protective Coating: ASTM A 653/A 653M, G40, hot-dip galvanized unless otherwise indicated.
- B. Studs and Tracks: ASTM C 645.
 - 1. Steel Studs and Tracks:
 - a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1) MRI Steel Framing, LLC.
 - 2) Steel Network, Inc. (The).
 - 3) ClarkDietrich Building Systems.
 - b. Base-Metal Thickness: 25 gauge
 - c. Depth: As indicated on Drawings.
 - d. Spacing: As indicated on Drawings.
- C. Slip-Type Head Joints: Provide one of the following:
 - 1. Double-Track System: ASTM C 645 top outer tracks, inside track with 2-inch- deep flanges in thickness not less than indicated for studs and fastened to studs, and outer track sized to friction-fit over inner track.

2. Deflection Track: Steel sheet top track manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs.

a. Products: Subject to compliance with requirements, provide one of the following:

- 1) ClarkDietrich Building Systems; SLP-TRK Slotted Deflection Track.
- 2) MBA Building Supplies; Slotted Deflecto Track.
- 3) Steel Network, Inc. (The);

D. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated.

1. Minimum Base-Metal Thickness: 0.0296 inch.

2.2 AUXILIARY MATERIALS

A. General: Provide auxiliary materials that comply with referenced installation standards.

1. Fasteners for Steel Framing: Of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.

B. Anchor Clip: Knee wall to foundation connections, 2" x 2" x 5-1.2", 14 gauge, G90 hot-dipped galvanized. Basis of Design: Clark Dietrich D685 Easy Clip, D-Series.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Installation Standard: ASTM C 754.

1. Gypsum Board Assemblies: Also comply with requirements in ASTM C 840 that apply to framing installation.

B. Install framing and accessories plumb, square, and true to line, with connections securely fastened.

C. Install supplementary framing, and blocking to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction.

D. Install bracing at terminations in assemblies.

E. Do not bridge building control and expansion joints with non-load-bearing steel framing members. Frame both sides of joints independently.

F. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch from the plane formed by faces of adjacent framing.

3.2 INSTALLING CEILING FRAMING SYSTEMS

A. Install framing system components according to spacings indicated, but not greater than spacings required by referenced installation standards for assembly types.

- B. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement.
- C. Secure framing system from building structure as follows:
 - 1. Install framing plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or suspension system.
 - a. Splay framing members only where required to miss obstructions and offset resulting horizontal forces by bracing.
 - 2. Where width of ducts and other construction within ceiling plenum produces framing spacings that interfere with locations of framing required to support standard framing system members, install supplemental framing members in the form of trapezes or equivalent devices.
 - a. Size supplemental framing members to support ceiling loads within performance limits established by referenced installation standards.
 - 3. Do not attach framing to steel roof deck.
 - 4. Do not attach framing to rolled-in hanger tabs of composite steel floor deck.
 - 5. Do not connect or suspend framing from ducts, pipes, or conduit.
- D. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

END OF SECTION 092216

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interior gypsum board.
 - 2. Tile Backer board.
 - 3. Acoustical sealant.
 - 4. Accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.3 QUALITY ASSURANCE

- A. Fire-Resistance-Rated Assemblies: For fire-resistance-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E 119 by an independent testing agency.

PART 2 - PRODUCTS

2.1 GYPSUM BOARD, GENERAL

- A. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 INTERIOR GYPSUM BOARD

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide
 - a. American Gypsum.
 - b. Georgia-Pacific Building Products.
 - c. USG.
- B. Gypsum Wallboard: ASTM C 1396/C 1396M
 - 1. Thickness: 5/8 inch.
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling.
- C. Type X: ASTM C 1396/C 1396M
 - 1. Thickness: 5/8 inch
 - 2. Long Edges: Tapered and featured (rounded or beveled) for prefilling

D. Abuse-Resistant Type: ASTM C 1629/C 1629M, level 2. Manufactured to produce greater resistance to surface indentation, through penetration (impact resistance), and abrasion than standard, regular-type and Type X gypsum board.

1. Core: 5/8-inch, Type X
2. Long Edges: Tapered and featured (rounded or beveled) for prefilling
3. Mold Resistance: ASTM D 3273, score of 10
4. Provide at all locations of gypsum board for the bottom four (4) feet above finish floor, minimum.

2.3 CEMENT BACKER BOARD

A. Cementitious Backer Units: ANSI A118.9 and ASTM C1288 or ASTM C1325, with manufacturer's standard edges.

1. Manufacturers: Subject to compliance with requirements provide products by one of the following:
 - a. CertainTeed Corporation.
 - b. National Gypsum Company.
 - c. USG Corporation.
2. Thickness: ½ inch.
3. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
4. Location: As indicated on Drawings and in shower compartments.

2.4 TRIM ACCESSORIES

A. Interior Trim: ASTM C 1047.

1. Material: Galvanized or aluminum-coated steel sheet, rolled zinc, plastic, or paper-faced galvanized-steel sheet Paper-faced galvanized-steel sheet.
2. Shapes:
 - a. Expansion (control) joint.
 - b. Cornerbead.
 - c. LC-Bead: J-shaped; exposed long flange receives joint compound.
 - d. L-Bead: L-shaped; exposed long flange receives joint compound.
 - e. U-Bead: J-shaped; exposed short flange does not receive joint compound.

2.5 JOINT TREATMENT MATERIALS

A. General: Comply with ASTM C 475/C 475M.

B. Joint Tape:

1. Interior Gypsum Board: Paper.

C. Joint Compound for Interior Gypsum Board: For each coat, use formulation that is compatible with other compounds applied on previous or for successive coats.

1. Prefilling: At open joints, **rounded or beveled panel edges**, and damaged surface areas, use setting-type taping compound.
2. Embedding and First Coat: For embedding tape and first coat on joints, fasteners, and trim flanges, use setting-type taping compound.

- a. Use setting-type compound for installing paper-faced metal trim accessories.
3. Fill Coat: For second coat, use setting-type, sandable topping compound.
4. Finish Coat: For third coat, use setting-type, sandable topping compound.

2.6 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that comply with referenced installation standards and manufacturer's written instructions.
- B. Steel Drill Screws: ASTM C 1002 unless otherwise indicated.
 1. Use screws complying with ASTM C 954 for fastening panels to steel members from 0.033 to 0.112 inch thick.
 2. For fastening cementitious backer units, use screws of type and size recommended by panel manufacturer.
- C. Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

PART 3 - EXECUTION

3.1 APPLYING AND FINISHING PANELS

- A. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged.
- B. Comply with ASTM C 840.
- C. Isolate perimeter of gypsum board applied to non-load-bearing partitions at structural abutments. Provide 1/4- to 1/2-inch- (6.4- to 12.7-mm-) wide spaces at these locations and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- D. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.
- E. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- F. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.
- G. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C 840:
 1. Level 4: At panel surfaces that will be exposed to view unless otherwise indicated.

3.2 PROTECTION

- A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

- B. Remove and replace panels that are wet, moisture damaged, and mold damaged.

END OF SECTION 092900

SECTION 09 3013 – CERAMIC TILING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Ceramic tile.

- B. Related Sections:

- 1. Division 07 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.

1.3 DEFINITIONS

- A. General: Definitions in the ANSI A108 series of tile installation standards and in ANSI A137.1 apply to Work of this Section unless otherwise specified.
- B. ANSI A108 Series: ANSI A108.01, ANSI A108.02, ANSI A108.5, ANSI A108.10, and ANSI A108.17, which are contained in "American National Standard Specifications for Installation of Ceramic Tile."
- C. Module Size: Actual tile size plus joint width indicated.
- D. Face Size: Actual tile size, excluding spacer lugs.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.

- C. Product Certificates: For each type of product, signed by product manufacturer.
- D. Material Test Reports: For each tile-setting and -grouting product.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

1.7 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain tile of each type and color or finish from one source or producer.
 - 1. Obtain tile of each type and color or finish from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from one manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section from a single manufacturer for each product:
 - 1. Joint sealants.
- D. Preinstallation Conference: Conduct conference at location determined by owner and Architect.
 - 1. Review requirements in ANSI A108.01 for substrates and for preparation by other trades.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirements in ANSI A137.1 for labeling tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination can be avoided.
- D. Store liquid materials in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.9 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.

1.10 EXTRA MATERIALS

- A. Furnish extra materials that match and are from same production runs as products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile: Furnish quantity of full-size units equal to 3 percent of amount installed for each type, composition, color, pattern, and size indicated.
 - 2. Grout: Furnish quantity of grout equal to 3 percent of amount installed for each type, composition, and color indicated.

PART 2 - PRODUCTS

2.1 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements unless otherwise indicated.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCA installation methods specified in tile installation schedules, and other requirements specified.
- C. Factory Blending: For tile exhibiting color variations within ranges, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- D. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer unless otherwise indicated.
 - 1. Where tile is indicated for installation in wet areas, do not use back- or edge-mounted tile assemblies unless tile manufacturer specifies in writing that this type of mounting is suitable for installation indicated and has a record of successful in-service performance.
- E. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.2 TILE PRODUCTS

- A. Glazed Ceramic tile.
 - 1. Manufacturers: Subject to compliance with requirements, provide, or comparable product if approved by Architect prior to bidding.

- a. American Olean. (Basis of Design).
 - b. Daltile.
 - c. Virginia Tile.
 - d. Concept Surfaces.
2. Product: Conrad Brick (Basis of Design)
- a. Composition: Glazed Ceramic.
 - b. Module Size:
 - 1) 2 by 8 inches.
 - c. Pattern for Wall: As shown on drawings.
 - d. Thickness: 3/8 inch.
 - e. Surface: Gloss.
 - f. Color: To be selected by Architect from manufacturer's full range of standard colors.
 - g. Grout Color: As selected by Architect from manufacturer's full range.
 - h. Grout Size: 1/16"

2.3 SETTING MATERIALS

- A. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4.
1. Manufacturers: Subject to compliance with requirements, provide product by one of the following:
 - a. TEC-Polymer Modified Mortar (Basis of Design).
 - b. Bonsal American; an Oldcastle company.
 - c. C-Cure.
 - d. Custom Building Products.
 - e. Laticrete International, Inc.
 - f. MAPEI Corporation.
 2. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added at Project site.
 3. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to the other requirements in ANSI A118.4.

2.4 GROUT MATERIALS

- A. Modified Tile Grout: ANSI A118.3.
1. Manufacturers: Subject to compliance with requirements, provide product from one of the following manufacturers:
 - a. TEC.; Power Grout, (Basis of Design).
 - b. MAPEI Corporation.
 - c. Bostick.
 2. Product shall meet or exceed ANSI A118.7 and ANSI 118.3.

2.5 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- C. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

2.6 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm, dry, clean, free of coatings that are incompatible with tile-setting materials including curing compounds and other substances that contain soap, wax, oil, or silicone; and comply with flatness tolerances required by ANSI A108.01 for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with thin-set mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

- B. Blending: For tile exhibiting color variations, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- C. Field-Applied Temporary Protective Coating: If indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 TILE INSTALLATION

- A. Comply with TCA's "Handbook for Ceramic Tile Installation" for TCA installation methods specified in tile installation schedules. Comply with parts of the ANSI A108 Series "Specifications for Installation of Ceramic Tile" that are referenced in TCA installation methods, specified in tile installation schedules, and apply to types of setting and grouting materials used.
- B. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- C. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- D. Jointing Pattern: Lay tile in grid pattern unless otherwise indicated. Lay out tile work and center tile fields in both directions in each space or on each wall area. Lay out tile work to minimize the use of pieces that are less than half of a tile. Provide uniform joint widths unless otherwise indicated.
 - 1. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.
 - 2. Where tiles are specified or indicated to be whole integer multiples of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
- E. Joint Widths: Unless otherwise indicated, install tile with the following joint widths:
 - 1. All Wall Tile: 1/16 inch

3.4 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 - 1. Remove grout residue from tile as soon as possible.
 - 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
 - 3. Remove temporary protective coating by method recommended by coating manufacturer and that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent drain clogging.

- B. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear. If recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors.
- C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
- D. Before final inspection, remove protective coverings and rinse neutral protective cleaner from tile surfaces.

END OF SECTION 09 3013

SECTION 095113 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes acoustical panels and exposed suspension systems for interior ceilings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6-inch- square Samples of each type, color, pattern, and texture.
 - 2. Exposed Suspension-System Members, Moldings, and Trim: Set of 6-inch- long Samples of each type, finish, and color.

1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, and coordinated with each other, using input from installers of the items involved.
 - 1. Suspended ceiling components.
 - 2. Structural members to which suspension systems will be attached.
 - 3. Size and location of initial access modules for acoustical panels.
 - 4. Items penetrating finished ceiling including the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Sprinklers.
 - 5. Contractor is responsible for quantifying ceiling devices.
 - 6. Perimeter moldings.
- B. Product test reports.
- C. Qualification Data: For testing agency.
- D. Research reports.
- E. Evaluation Reports: For each acoustical panel ceiling suspension system, from ICC-ES.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Acoustical Ceiling Panels: Full-size panels equal to 2 percent of quantity installed.
 - 2. Suspension-System Components: Quantity of each exposed component equal to 2 percent of quantity installed.

1.6 DELIVERY, STORAGE, AND HANDLING

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

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Class A according to ASTM E 1264.
 - 2. Smoke-Developed Index: 50 or less.

2.2 ACOUSTICAL PANELS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Armstrong World Industries, Inc.
 - 2. Chicago Metallic Corporation.
 - 3. United States Gypsum Company.(Basis of Design)
- B. Acoustical Panel Standard: Manufacturer's standard panels according to ASTM E 1264.
- C. Product: Type A - USG "Mars Acoustical Panels", Item No. 86185.

1. Color: White.
2. Light Reflectance (LR): Not less than 0.90.
3. Ceiling Attenuation Class (CAC): Not less than 35.
4. Noise Reduction Coefficient (NRC): Not less than 0.75.
5. Edge/Joint Detail: Square edge sized to fit flange of exposed suspension-system members.
6. Thickness: 3/4 inch .
7. Modular Size: Type A - 24 by 24 inches

D. Product: Type B - USG "Mars High NRC/High CAC Acoustical Panels", Item No. 88345.

1. Color: Black.
2. Light Reflectance (LR): Not less than 0.90.
3. Ceiling Attenuation Class (CAC): Not less than 35.
4. Noise Reduction Coefficient (NRC): Not less than 0.75.
5. Edge/Joint Detail: Square edge sized to fit flange of exposed suspension-system members.
6. Thickness: 1 inch .
7. Modular Size: Type B - 24 by 48 inches
8. Grid: 15/16"wide, painted black.

2.3 METAL SUSPENSION SYSTEM

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Armstrong World Industries, Inc.
2. CertainTeed Corporation.
3. Chicago Metallic Corporation.
4. United States Gypsum Company.

B. Metal Suspension-System Standard: Manufacturer's standard, direct-hung, metal suspension system and accessories according to ASTM C 635/C 635M.

C. Wide-Face, Capped, Double-Web, Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet; prepainted, electrolytically zinc coated, or hot-dip galvanized, G30 coating designation; with prefinished 15/16-inch- wide metal caps on flanges.

2.4 ACCESSORIES

A. Attachment Devices: Size for five times the design load indicated in ASTM C 635/C 635M, Table 1, "Direct Hung," unless otherwise indicated.

B. Noise Control Wire-Tie Ceiling Hanger : One-inch rated deflection spring with rubber elements to support gypsum board as shown in Construction Documents.

1. Basis of Design: Kinetics Noise – Sparta Wire-Tie Ceiling Hanger.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders unless otherwise indicated.
- B. Layout openings for penetrations centered on the penetrating items.

3.2 INSTALLATION

- A. Install acoustical panel ceilings according to ASTM C 636/C 636M and manufacturer's written instructions.
- B. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
- C. Suspend ceiling hangers from building's structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 3. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension-system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices.
 - 4. Secure wire hangers to ceiling-suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 5. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both the structure to which hangers are attached and the type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
 - 6. When steel framing does not permit installation of hanger wires at spacing required, install carrying channels or other supplemental support for attachment of hanger wires.
 - 7. Do not attach hangers to steel deck tabs.
 - 8. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 9. Space hangers not more than 48 inches o.c. along each member supported directly from hangers unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.
 - 10. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
- D. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Install edge moldings and trim at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
3. Do not use exposed fasteners, including pop rivets, on moldings and trim.

E. Install suspension-system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

F. Install acoustical panels with undamaged edges and fit accurately into suspension-system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.

1. Paint cut edges of panel remaining exposed after installation; match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical panel manufacturer.

3.3 CLEANING

A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension-system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095113

SECTION 096519 - RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Luxury Vinyl Tile.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification: Full-size units of each color and pattern of floor tile required.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Floor Tile: Furnish equivalent of 5% of overall floor tile quantity of each type, color, and pattern of floor tile installed, but not less than one full box.

1.6 QUALITY ASSURANCE

- A. Installation Qualification: An entity that employs installers and supervisors who are competent in techniques required by manufacturer for floor tile installation and seaming method indicated.
 - 1. Engage an installer who employs workers for this Project who are trained or certified by floor tile manufacturer for installation techniques required.

1.7 DELIVERY, STORAGE, AND HANDLING

- B. Store floor tile and installation materials in clean, dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F. Store floor tiles on flat surfaces.

1.8 FIELD CONDITIONS

- A. Ambient temperature range for installation varies among manufacturers. Consult manufacturers for recommendations and revise first paragraph below to suit Project.
- B. Maintain ambient temperatures within range recommended by manufacturer, but not less than 65 deg F or more than 85 deg F, in spaces to receive floor tile during the following periods:
 - 1. 48 hours before installation.
 - 2. During installation.

3. 48 hours after installation.
- C. After installation and until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F or more than 85 deg F.
- D. Close spaces to traffic during floor tile installation.
- E. Close spaces to traffic for 48 hours after floor tile installation.
- F. Install floor tile after other finishing operations, including painting, have been completed.

PART 2 - PRODUCTS

2.1 LUXURY VINYL TILE (LVT)

- A. Manufacturers: Subject to compliance with requirements, provide the following Basis of Design:
 1. LVT1: Daltile – Multimedia Wood – Nook Glue Down – Beige MW31
 - a. Overall Thickness: 5mm
 - b. Wear Layer Thickness: 20 mil
 - c. Finish: TitanGuard Technology
 - d. Wearing Surface: Embossed.
 - e. Size: 18 x 18 inches
 - f. Installation: Monolithicl.
 2. LVT2: Milliken – Fortified Foundations 5mm – Terrazzo – Nickel TRZ257
 - a. Overall Thickness: 5mm
 - b. Wear Layer Thickness: 22 mil
 - c. Finish: ProGuard Coating
 - d. Wearing Surface: Smooth
 - e. Size: 18 x 36 inches.
 - f. Installation: Ashlar.
 3. LVT3: Owner Provided; Contractor Installed
 - a. Contractor to provide adhesive for installation
- B. Construction: Heavy Commercial Luxury Vinyl Tile
- C. Tile Standard: ASTM F 1700, Class III Printed film vinyl plank, Type B

2.2 ITrowelable Leveling and Patching Compounds: Latex-modified, portland-cement-based or blended hydraulic-cement-based formulation provided or approved by floor tile manufacturer for applications indicated.

- E. Adhesives: Water-resistant, High RH type recommended by resilient floor tile manufacturer to suit floor tile and substrate conditions indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to floor tile manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by floor tile manufacturer. Do not use solvents.
3. Alkalinity and Adhesion Testing: Perform tests recommended by floor tile manufacturer. Proceed with installation only after substrate alkalinity falls within range on pH scale recommended by manufacturer in writing, but not less than 5 or more than 10 pH.
4. Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft. and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.
 - a. Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum vapor-emission rate of 3lb of water/1000 sq. ft. in 24 hours.
 - b. Perform additional moisture tests recommended in writing by adhesive and resilient tile manufacturers. Proceed with installation only after substrates pass testing.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound; remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until materials are the same temperature as space where they are to be installed.

1. At least 48 hours in advance of installation, move resilient floor tile and installation materials into spaces where they will be installed.

E. Immediately before installation, sweep and vacuum clean substrates to be covered by resilient floor tile.

3.3 RESILIENT TILE FLOORING INSTALLATION

A. Comply with manufacturer's written instructions for installing resilient tile flooring.

B. Lay out floor tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles square with room axis.
2. Install material in a monolithic pattern following the manufacturer's guidelines.
3. Install material according to directional arrow on the back of the material.

C. Scribe, cut, and fit floor tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and door frames.

- D. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent marking device.
- F. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in installation areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.
- G. Adhere floor tiles to substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protecting floor tile.
- B. Perform the following operations immediately after completing floor tile installation:
 - 1. Remove adhesive and other blemishes from surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.
- C. Protect resilient product from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
 - 1. No traffic for 24 hours after installation.
 - 2. No heavy traffic, rolling loads, or furniture placement for 72 hours after installation.
- D. Wait 72 hours after installation before performing initial cleaning.
- E. Cover floor tile until Substantial Completion.

END OF SECTION 096519

SECTION 09 6813 – TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes modular, tip sheared patterned loop carpet and Textured patterned loop carpet tile.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include manufacturer's written data on physical characteristics, durability, and fade resistance.
 - 2. Include installation recommendations for each type of substrate.
- B. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample for initial selection.

1.3 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Sample Warranty: For special warranty.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:
 - 1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
 - 2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 2 percent of amount installed for each type indicated, but not less than 10 sq. yd. (8.3 sq. m) of same dye lot as installed. Contractor shall contact architect and owner when delivered and stored for verification.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the International Certified Floorcovering Installers Association.
- B. Fire-Test-Response Ratings: Where indicated, provide carpet tile identical to those of assemblies tested for fire response according to NFPA 253 by a qualified testing agency.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104.

1.8 FIELD CONDITIONS

- A. Comply with CRI 104 for temperature, humidity, and ventilation limitations.
- B. Environmental Limitations: Do not deliver or install carpet tiles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at occupancy levels during the remainder of the construction period.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.9 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent edge raveling, snags, runs, excess static discharge, loss of tuft bind strength, loss of face fiber, and delamination.
 - 3. Warranty Period: 10 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 TILE CARPETING

- A. Manufacturer: Subject to compliance with requirements, provide the following Basis of Design:
 - 1. **CPT1** Basis of Design: J&J Flooring – Fractured Plaid – Chintz 2882
 - a. Dye Method: 100% Solution Dyed
 - b. Fiber Content: Encore BCF
 - c. Backing: Nexus Modular
 - d. Face Weight: 23 oz/yd
 - e. Gauge: 1/12
 - f. Size: 24 by 24 inches
 - g. Installation: Monolithic

2. **CPT2** Basis of Design: Mohawk – Relaxing Floors - Fractal Ground GT425 – Blue Bliss 965
 - a. Dye Method: 100% Solution Dyed
 - b. Fiber Content: Durcolor Tricolor Premium Nylon
 - c. Backing: EcoFlex ONE
 - d. Face Weight: 22 oz/yd
 - e. Gauge: 1/12
 - f. Size: 12 by 36 inches
 - g. Installation: Brick Ashlar
- B. Performance Characteristics: As follows:
 1. ASTM E-648 / NFPA 253: Class 1 (CRF: 0.45 watts/sq cm or greater)
 2. Federal Flammability: CPSC FF 1-70: Passes
 3. Smoke Density: ASTM E-662 / NFPA 258: ≤ 450 Flaming Mode
 4. Electrostatic Propensity: AATCC 134 (Step & Scuff): 3.0 kV or less
 5. Static Coefficient of Friction: ASTM C-1028: Passes ADA Requirements for Accessible Routes (minimum 0.60)
 6. Delamination of Secondary Backing of Pile Floor Coverings: ASTM D-3936: No Delamination
 7. Lightfastness: ≥ 4 @ 100 hours if solution dyed >> <<AATCC 16E
 8. Dimensional Stability: Aachen / ISO 2551: Maximum Change +/- 0.149%
 9. Moisture Barrier: Moisture Penetration by Impact @ 10 psi: No Penetration of backing after 10,000 impacts.
- C. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- D. Adhesives: Water-resistant, mildew-resistant, nonstaining, High-RH adhesive to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 1. Adhesives shall have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
 2. Subfloor finishes comply with requirements specified in Division 03 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm) unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Maintain dye lot integrity. Do not mix dye lots in same area.
- C. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- D. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, non-staining marking device.
- F. Install pattern parallel to walls and borders.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove yarns that protrude from carpet tile surface.
 - 2. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protecting Indoor Installations."

- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 6813

SECTION 097713 - STRETCHED-FABRIC WALL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes site-upholstered wall systems.

1.2 DEFINITIONS

- A. NRC: Noise Reduction Coefficient.
- B. SAA: Sound Absorption Average.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include fabric facing, frame edge and trim, core material, and mounting indicated.
- B. Sustainable Design Submittals:
- C. Shop Drawings: For each stretched-fabric system.
 - 1. Include plans, elevations, sections, and installation and system details.
 - 2. Include details at head, base, joints, and corners; and details at ceiling, floor base, and wall intersections. Indicate frame-edge profile and core materials.
 - 3. Include details at cutouts and penetrations for other work.
 - 4. Include direction of fabric weave and pattern matching.
 - 5. Show sewn-seam locations, types, and methods.
- D. Samples for Verification: For the following products:
 - 1. Frame System: 12-inch- square Sample(s) showing each edge profile and corner.
 - 2. Core Material: 12-inch- square Sample at corner.

1.5 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Elevations and other details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Electrical outlets, switches, and thermostats.
 - 2. Items penetrating or covered by stretched-fabric systems including the following:

- a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Speakers.
 - d. Alarms.
 - e. Sprinklers.
 - f. Access panels.
3. Show operation of hinged and sliding components covered by or adjacent to stretched-fabric systems.
- B. Qualification Data: For Installer.
 - C. Product Certificates: For each type of stretched-fabric system.
 - D. Sample Warranty: For special warranty.
- 1.6 CLOSEOUT SUBMITTALS
- A. Maintenance Data: For stretched-fabric systems to include in maintenance manuals. Include fabric manufacturer's written cleaning, stain-removal, restretching, and reupholstering instructions.
- 1.7 MAINTENANCE MATERIAL SUBMITTALS
- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Fabric: For each fabric, color, and pattern installed, furnish length equal to 10 percent of amount installed, but no fewer than **10 sq. yd.**, full width of bolt.
 2. Framing and Related Installation Items: Furnish manufacturer's full-length units equal to 5 percent of amount installed, but no fewer than five units, including unopened adhesives.
- 1.8 QUALITY ASSURANCE
- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.
 - B. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials, fabrication, and installation.
 1. Build mockup of typical wall area as shown on Drawings.
 2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
 3. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Comply with fabric and stretched-fabric system manufacturers' written instructions for minimum and maximum temperature and humidity requirements for shipment, storage, and handling.

- B. Deliver materials in unopened bundles and store in a temperature-controlled dry place with adequate air circulation.

1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not install stretched-fabric systems until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work at and above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- B. Lighting: Do not install stretched-fabric systems until a permanent level of lighting is provided on surfaces to receive stretched-fabric systems.

1.11 WARRANTY

- A. Special Warranty: Manufacturer and Installer agree to repair or replace components of stretched-fabric systems that fail in performance, materials, or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Acoustical performance.
 - b. Fabric sagging, distorting, or releasing from panel edge.
 - c. Warping of core.
 - 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain stretched-fabric wall systems specified in this Section from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Fire-Test-Response Characteristics: Stretched-fabric wall systems are to comply with "Surface-Burning Characteristics" or "Fire Growth Contribution" Subparagraph below, or both, as determined by testing identical products by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. Surface-Burning Characteristics: Comply with ASTM E84 or UL 723; testing by a qualified testing agency on systems prepared according to ASTM E2573. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: 25 or less.
 - b. Smoke-Developed Index: 450 or less.
 - 2. Fire Growth Contribution: Comply with acceptance criteria of local code and authorities having jurisdiction when tested according to NFPA 286.

2.3 STRETCHED-FABRIC WALL SYSTEMS

- A. Stretched-Fabric Wall System: Manufacturer's standard system consisting of facing material stretched tightly over a frame and core material and secured in the frame.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Accutrack Systems, LLC
 - b. Fabricmate Systems, Inc.
 - c. Novawall Systems, Inc
 - d. Whisper Walls
 2. Core: Glass-fiber board.
 - a. Nominal Core Thickness: 2 inches.
 3. Frame Edge: Square profile.
 - a. Fabric-Insertion Point: Side load.
 - b. Nominal Frame Thickness: Match nominal core thickness.
 4. Reveals between Panels: Flush reveals as selected by Architect from manufacturer's full range.
 5. Acoustical Performance: Sound absorption NRC of 0.85 according to ASTM C423 for All types mounting according to ASTM E795.
 6. Nominal Overall System Thickness: 2 inches.

2.4 MATERIALS

- A. Sustainable Design Requirements:
- a. Hardwood Plywood: 0.05 ppm.
 - b. Particleboard: 0.09 ppm.
 - c. MDF More Than 5/16 Inch Thick: 0.11 ppm.
 - d. MDF 5/16 Inch or Less in Thickness: 0.13 ppm.
- B. Core Materials: Manufacturer's standard.
1. Glass-Fiber Board: ASTM C612; of type standard with manufacturer; nominal density of 6 to 7 lb/cu. ft., unfaced, and dimensionally stable, molded rigid board; and with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.
 2. Wood and Plywood: Manufacturer's standard plywood or clear, vertical grain, straight, kiln-dried hardwood.
 - a. Fire-retardant treated by pressure process with a flame-spread index of 25 or less when tested according to ASTM E84 or UL 723, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1) Treated material is to have a moisture content of 28 percent or less when tested according to ASTM D3201/D3201M at 92 percent relative humidity.
 - 2) Kiln-dry material after treatment to 7 to 13 percent or less for lumber and 15

percent or less for plywood.

- C. Frame Construction: Manufacturer's standard, continuous, extruded plastic frame (track).
- D. Facing Material : Fabric from same dye lot; color and pattern as selected by Architect from manufacturer's full range.
 - 1. Manufacturer: Duvaltex – Guilford of Maine.
 - 2. Product Line/Pattern:FR701 2100.
 - 3. Pattern Repeat: None.
 - 4. Color:
 - a. FWP1: Baltic 153
 - b. FWP2: Wedgewood 150
 - c. FWP3: As selected by Architect from Manufacturer's full range of standard colors.
 - 5. Fiber Content: 100 percent Post-consumer recycled polyester.
 - 6. Width: 66 inches.

2.5 INSTALLATION MATERIALS

- A. Installation Products: Concealed on back of system, recommended by stretched-fabric system manufacturer to support weight of system, fabric tension, and as follows:
 - 1. Fasteners: Manufacturer's standard.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine fabric, materials, substrates, areas, and conditions, with Installer present, for compliance with requirements, installation tolerances, and other conditions affecting performance of stretched-fabric systems.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Measure each area and establish layout of panels and joints of sizes indicated on Drawings within a given area.
- B. Before installation, allow fabric to adjust and become stable in spaces where it will be installed according to stretched-fabric system manufacturer's written instructions. Acclimatize fabric for minimum of 24 hours at ambient temperature and humidity conditions indicated for spaces when occupied for their intended use.

3.3 INSTALLATION

- A. Install stretched-fabric systems according to system manufacturer's written instructions.

1. Provide continuous perimeter frames of each profile indicated, designed to be inconspicuous when covered by fabric facing, with smooth edges, and with surface finish that will not telegraph through fabric facing.
 2. Install framing around penetrations.
 3. Tightly fit framing to adjacent construction and securely attach to substrate.
 4. Install core material with full coverage, flush with face of stretched-fabric system frame.
 5. Attach frame and core to substrate with adhesive or fasteners or both to support system and prevent deformation of components.
 6. Install stretched-fabric systems level and plumb unless otherwise indicated, true in plane, and with fabric square to the grain.
 7. Install jointed panels with butt joints as indicated.
- B. Fabric Installation: Apply fabric monolithically in continuous run over area, without joints or reveals, except where panel joints or midspan frames are indicated.
1. Fabric Direction: Run fabric up the bolt.
 2. Fabric Sequence: Maintain sequence of fabric drops; match and level fabric pattern and grain.
 3. Fabric Alignment: Install fabric with patterns or directional weaves so pattern or weave aligns with adjacent panels.
 4. Fabric Seams:
 - a. Sewn seams are not permitted.
 5. Core Overlay: Evenly stretch over core face and edges; free from puckers, ripples, wrinkles, and sags.
 6. Stretch and secure fabric to frame edges and so frame and frame attachment method are concealed by fabric unless otherwise indicated.
 7. Stretch fabric tightly and square without puckers, ripples, or distortions. Acclimatize and restretch if recommended by stretched-fabric system manufacturer. Repair distortions, wrinkles, and sagging.

3.4 INSTALLATION TOLERANCES

- A. Edge Straightness: Plus or minus 1/16 inch in 48 inches.
- B. Variation from Level and Plumb: Plus or minus 1/16 inch in 48 inches, noncumulative.
- C. Variation of Joint Width: Not more than 1/16 inch in 48 inches from hairline, noncumulative.

3.5 CLEANING

- A. Clip loose threads; remove pills and extraneous materials.
- B. Clean panels on completion of installation to remove dust and other foreign materials according to manufacturer's written instructions.

END OF SECTION 097713

SECTION 09 9123 - INTERIOR PAINTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following interior substrates:
 - 1. Gypsum board.
 - 2. Steel Door Frames.
 - 3. Wood.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
- B. Samples for Verification: For each type of paint system and in each color and gloss of topcoat.
 - 1. Submit Samples on rigid backing, 8 inches (200 mm) square.
 - 2. Step coats on Samples to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.
- C. Product List: For each product indicated, include the following:
 - 1. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
 - 2. Printout of current "MPI Approved Products List" for each product category specified in Part 2, with the proposed product highlighted.
 - 3. VOC content.

1.4 QUALITY ASSURANCE

- A. MPI
 - 1. Products: Complying with MPI standards indicated and listed in "MPI Approved Products List."
 - 2. Preparation and Workmanship: Comply with requirements in "MPI Architectural Painting Specification Manual" for products and paint systems indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F (7 deg C).
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F (10 and 35 deg C).
- B. Do not apply paints when relative humidity exceeds 85 percent; at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint: 5 percent, but not less than 1 gal. (3.8 L) of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Company
 - 2. PPG Architectural Finishes, Inc.
 - 3. Sherwin-Williams Company

2.2 PAINT, GENERAL

- A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."
- B. Material Compatibility:
 - 1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.
- C. Colors: As selected by Architect from manufacturer's full range and indicated on Drawing Sheet A701.

2.3 BLOCK FILLERS

- A. Block Filler, Latex, Interior/Exterior: MPI #4.

2.4 PRIMERS/SEALERS

- A. Interior Latex Primer/ Sealer: MPI #50.

2.5 METAL PRIMERS

- A. Primer, Alkyd, Quick Dry, for Metal: MPI #76.

2.6 LATEX PAINTS

- A. Interior Latex (Eggshell): MPI #52 (Gloss Level 3)

2.7 QUICK -DRYING ENAMELS

- A. Quick-Drying Enamel (Semigloss): MPI #81 (Gloss Level 5).

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Gypsum Board: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
- C. Gypsum Board Substrates: Verify that finishing compound is sanded smooth.
- D. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- E. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Manual" applicable to substrates indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
 - 2. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.
 - 1. Remove incompatible primers and re-prime substrate with compatible primers or apply tie coat as required to produce paint systems indicated.
- D. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceed that permitted in manufacturer's written instructions.
- E. Steel Substrates: Remove rust, loose mill scale, and shop primer, if any. Clean using methods recommended in writing by paint manufacturer.
- F. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
- G. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
- H. Wood Substrates:
 - 1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
 - 2. Sand surfaces that will be exposed to view, and dust off.
 - 3. Prime edges, ends, faces, undersides, and backsides of wood.
 - 4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Manual."
 - 1. Use applicators and techniques suited for paint and substrate indicated.
 - 2. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 3. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

- B. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
- C. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.
- D. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.
- E. Painting Structural, Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
 - 1. Paint the following work where exposed in equipment rooms and occupied spaces, including but not limited to, the following:
 - a. Uninsulated plastic piping.
 - b. Uninsulated metal piping.
 - c. Pipe hangers and supports.
 - d. Metal conduit.
 - e. Tanks that do not have factory-applied final finishes.
 - f. Duct, equipment, and pipe insulation having cotton or canvas insulation covering or other paintable jacket material.
 - g. Mechanical equipment that is indicated to have a factory-primed finish for field painting.
 - h. Visible portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets.
Exterior surfaces of all exposed ductwork; and mechanical, electrical and plumbing equipment, piping, cable trays and conduit and piping, and structural work in locations scheduled to receive dry fog/fall paint.
 - i. Other items as directed by Architect.
 - 2. Electrical Work:
 - a. Switchgear.
 - b. Panelboards.
 - c. Electrical equipment that is indicated to have a factory-primed finish for field painting.
 - 3. Paint portions of internal surfaces of metal ducts, without liner, behind air inlets and outlets that are visible from occupied spaces.

3.4 FIELD QUALITY CONTROL

- A. Dry Film Thickness Testing: Contractor will engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.
 - 1. Contractor shall touch up and restore coated surfaces damaged by testing.
 - 2. If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

3.5 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.6 INTERIOR PAINTING SCHEDULE

- A. Steel Substrates:
 - 1. Quick-Drying Enamel System (typical):
 - a. Prime Coat: Quick-drying alkyd metal primer.
 - 1) Kem Kromik Universal Metal Alkyd Primer
 - b. Intermediate Coat: Quick-drying enamel matching topcoat.
 - 1) Sherwin Williams Direct-To-Metal B55W101
 - c. Topcoat: Quick-drying enamel (Gloss Level 5).
 - 1) Sherwin Williams Direct-To-Metal B55W101
- B. Gypsum Board Substrates:
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Primer sealer, interior, institutional low odor/VOC
 - 1) Sherwin Williams Promar 200 Zero VOC Latex Primer
 - b. Intermediate Coat: Interior Latex institutional low odor/VOC, matching topcoat.
 - 1) Sherwin Williams Promar 200 Zero VOC Interior Latex Eggshell
 - c. Topcoat: Interior latex institutional low odor/VOC (MPI Gloss Level 3).
 - 1) Sherwin Williams Promar 200 Zero VOC Interior Latex Eggshell
- C. Wood Substrates: Wood Trim and Architectural Woodwork
 - 1. Institutional Low-Odor/VOC Latex System:
 - a. Prime Coat: Primer, latex, for interior wood.
 - 1) Sherwin Williams Multi-Purpose Latex Primer/Sealer
 - b. Intermediate Coat: Latex, interior, institutional low odor/VOC, matching topcoat.
 - c. Topcoat: Latex, interior, institutional low odor/VOC (MPI Gloss Level 3).
 - 1) Sherwin Williams Promar 200 Zero VOC Interior Latex Eggshell

3.7 COLORS

- A. Colors are to be selected during construction with general color quantities per area as follows:

1. The Den:
 - a. Primary Field Wall Color
 - b. Accent colors per Finish Floor Plan
 - c. Door Frame color
 - d. Existing Doors

2. Workshop:
 - a. Primary Field Wall Color
 - b. Accent colors per Finish Floor Plan
 - c. Door Frame color

3. Theatre:
 - a. Accent Field Wall Color
 - b. Door Frame color
 - c. Existing Doors

4. Miscellaneous:
 - a. All Elements within a painted wall shall be painted, including existing door frames all exposed surfaces, mechanical units and enclosures, electrical panel boxes, blank cover plates, conduit, etc.

END OF SECTION 09 9123

SECTION 099300 - STAINING AND TRANSPARENT FINISHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood stains.
 - 2. Transparent finishes.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. For each type of product.
 - 2. Include preparation requirements and application instructions.
- B. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.
- C. Samples for Verification: Sample for each type of finish system and in each color and gloss of finish required on representative samples of actual wood substrates.
 - 1. Size: 8 inches long.
 - 2. Apply coats on Samples in steps to show each coat required for system.
 - 3. Label each coat of each Sample.
 - 4. Label each Sample for location and application area.

1.3 MAINTENANCE MATERIAL SUBMITTALS

- A. Extra Stock Material: Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Stains and Transparent Finishes: 5 percent, but not less than 1 gal. of each material and color applied.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.5 FIELD CONDITIONS

- A. Apply finishes only when temperature of surfaces to be finished and ambient air temperatures are between 50 and 95 deg F.
- B. Do not apply finishes when relative humidity exceeds 85 percent, at temperatures of less than 5 deg F above the dew point, or to damp or wet surfaces.
- C. Do not apply exterior finishes in snow, rain, fog, or mist.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Source Limitations: Obtain each coating product from single source from single manufacturer.

2.2 STAINING AND TRANSPARENT FINISHING

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Co.
 - 2. Sherwin-Williams Company (The)
 - 3. The Pittsburgh Paints Company
- B. Material Compatibility:
 - 1. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
- C. Stain Colors: As selected by Architect from manufacturer's full range.

2.3 WOOD STAINS

- A. Stain, Interior, Semitransparent, for Interior Wood: Solvent-based, oil or oil/alkyd, semitransparent, pigmented stain for new interior wood surfaces that are to be finished with a clear varnish.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Sherwin-Williams Company (The)
 - b. The Pittsburgh Paints Company

2.4 TRANSPARENT FINISHES

- A. Varnish, Interior, Water Based, Clear, Semigloss: Water-based clear semigloss coating for interior wood trim, frames, doors, paneling and cabinetry.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Benjamin Moore & Co.
 - b. Sherwin-Williams Company (The)
 - c. The Pittsburgh Paints Company
 - 2. Gloss Level: Manufacturer's standard semigloss finish.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Interior Wood Substrates: 13 percent, when measured with an electronic moisture meter.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with finish application only after unsatisfactory conditions have been corrected.
 - 1. Beginning finish application constitutes Contractor's acceptance of substrates and conditions.

3.2 PREPARATION

- A. Remove hardware, covers, plates, and similar items already in place that are removable. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and finishing.
 - 1. After completing finishing operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.
- B. Clean and prepare surfaces to be finished according to manufacturer's written instructions for each substrate condition and as specified.
 - 1. Remove dust, dirt, oil, and grease by washing with a detergent solution; rinse thoroughly with clean water and allow to dry. Remove grade stamps and pencil marks by sanding lightly. Remove loose wood fibers by brushing.
 - 2. Remove mildew by scrubbing with a commercial wash formulated for mildew removal and as recommended by stain manufacturer.
- C. Interior Wood Substrates:

1. Scrape and clean knots, and apply coat of knot sealer before applying primer.
2. Apply wood filler paste to open-grain woods to produce smooth, glasslike finish.
3. Sand surfaces exposed to view and dust off.
4. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dry.

3.3 APPLICATION

- A. Apply finishes according to manufacturer's written instructions.
 1. Use applicators and techniques suited for finish and substrate indicated.
 2. Finish surfaces behind movable equipment and furniture same as similar exposed surfaces.
 3. Do not apply finishes over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
- B. Apply finishes to produce surface films without cloudiness, holidays, lap marks, brush marks, runs, ropiness, or other surface imperfections.

3.4 CLEANING AND PROTECTION

- A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
- B. After completing finish application, clean spattered surfaces. Remove spattered materials by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.
- C. Protect work of other trades against damage from finish application. Correct damage by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.
- D. At completion of construction activities of other trades, touch up and restore damaged or defaced finished wood surfaces.

3.5 INTERIOR WOOD-FINISH-SYSTEM SCHEDULE

- A. Wood Substrates:
 1. Water-Based Varnish over Stain System:
 - a. Stain Coat: Stain, semitransparent, for interior wood.
 - b. First Intermediate Coat: Water-based varnish matching topcoat.
 - c. Second Intermediate Coat: Water-based varnish matching topcoat.
 - d. Topcoat: Varnish, water based, clear, semigloss.

END OF SECTION 099300

SECTION 101100 - VISUAL DISPLAY UNITS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resinous markerboards.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Resinous markerboards.
- B. Product Data Submittals: For each product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, finishes, and accessories for visual display units.
- C. Shop Drawings: For visual display units.
 - 1. Include plans, elevations, sections, details, and attachment to other work.
 - 2. Include sections of typical trim members.

1.3 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For visual display units to include in maintenance manuals.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver factory-fabricated visual display units completely assembled in one piece. If dimensions exceed maximum manufactured unit size, or if unit size is impracticable to ship in one piece, provide two or more pieces with joints in locations indicated on approved Shop Drawings.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install visual display units until spaces are enclosed and weathertight, wet-work in spaces is complete and dry, work above ceilings is complete, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.6 WARRANTY

- A. Special Warranty for Porcelain-Enamel Face Sheets: Manufacturer agrees to repair or replace porcelain-enamel face sheets that fail in materials or workmanship within specified warranty

period.

1. Failures include, but are not limited to, the following:
 - a. Surfaces lose original writing and erasing qualities.
 - b. Surfaces exhibit crazing, cracking, or flaking.
2. Warranty Period:
 - a. 20 years from date of Substantial Completion.
 - b. Life of the building.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.

2.2 RESINOUS MARKERBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. deko Markerboards (Basis of Design)
- B. Substitutions are acceptable provided they meet the requirements herein.
- C. Products:
 1. Basis of Design Product: deko premier markerboards.
 2. Resinous Markerboard: Glass-free, magnetic, non-staining, resinous panel, factory finished edges, flexible, shatterproof and optically clear.
 - a. Non-staining shall mean impervious to staining from dry erase, wet erase, and permanent markers.
 - b. Markerboard colorant: Permanent opaque color on back.
 - c. Markerboard weight: 2.5 LB/SF.
 3. Steel backing panel for use with magnets.
 4. Edge and Corner Detail: Crown (Standard)
 5. Markerboard Mounting (Setting): "Bond" or Manufacturer's standard liquid adhesive.
 6. Size and Shape: As indicated on construction drawings.
 7. Color: Grid.
 8. Orientation: As indicated on construction drawings.
- D. Sustainability
 1. Red List Chemical Free: contains no added urea formaldehyde, volatile organic

- compounds, polyvinyl chlorides or any other chemical on the Red List.
- 2. Post-Consumer Recycled Content: 33.66% (magnetic).
- 3. Pre-Consumer Recycled Content: 18.66% (magnetic).

2.3 MATERIALS

- A. Porcelain-Enamel Face Sheet: PEI-1002, with face sheet manufacturer's standard two- or three-coat process.
- B. Extruded Aluminum: ASTM B221, Alloy 6063.
- C. Adhesives for Field Application: Mildew-resistant, nonstaining adhesive for use with specific type of panels, sheets, or assemblies; and for substrate application; as recommended in writing by visual display unit manufacturer.

2.4 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA AMP 500 for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Installer present, for compliance with requirements for installation tolerances, surface conditions of wall, and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of connections before installation of motorized, sliding visual display units.
- C. Examine walls and partitions for proper preparation and backing for visual display units.
- D. Examine walls and partitions for suitable framing depth where sliding visual display units will be installed.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions for surface preparation.
- B. Clean substrates of substances, such as dirt, mold, and mildew, that could impair the

performance of and affect the smooth, finished surfaces of visual display boards.

- C. Prepare surfaces to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, defects, projections, depressions, and substances that will impair bond between visual display units and wall surfaces.
- D. Prime wall surfaces indicated to receive visual display units and as recommended in writing by primer/sealer manufacturer and visual display unit manufacturer.
- E. Prepare recesses for sliding visual display units as required by type and size of unit.

3.3 INSTALLATION

- A. General: Install visual display surfaces in locations and at mounting heights indicated on Drawings, or if not indicated, at heights indicated below. Keep perimeter lines straight, level, and plumb. Provide grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories necessary for complete installation.
- B. Field-Assembled Visual Display Board Assemblies: Coordinate field-assembled units with grounds, trim, and accessories indicated. Join parts with a neat, precision fit.
 - 1. Where size of visual display board assemblies or other conditions require support in addition to normal trim, provide structural supports or modify trim as indicated or as selected by Architect from manufacturer's standard structural support accessories to suit conditions indicated.
- C. Factory-Fabricated Visual Display Board Assemblies:
 - 1. Adhere to wall surfaces with Manufacturer's recommended size adhesive gobs at 16 inches o.c., horizontally and vertically.
 - 2. Attach concealed clips, hangers, and grounds to wall surfaces and to visual display board assemblies with fasteners at not more than 16 inches o.c. Secure tops and bottoms of boards to walls.

3.4 CLEANING AND PROTECTION

- A. Clean visual display units in accordance with manufacturer's written instructions. Attach one removable cleaning instructions label to visual display unit in each room.
- B. Touch up factory-applied finishes to restore damaged or soiled areas.
- C. Cover and protect visual display units after installation and cleaning.

END OF SECTION 101100

SECTION 10 1423 - SIGNAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 1. Panel signs.
 2. Mounting Accessories

1.3 DEFINITIONS

- A. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication and installation details for signs.
 1. Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
 2. Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.
 3. Include plans, elevations, sections, and attachment details
- C. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available for the following:
 1. Acrylic sheet.
- D. Samples for Verification: For each of the following products and for the full range of color, texture, and sign material indicated, of sizes indicated:
 1. Acrylic Sheet: 8 by 10 inches (200 by 250 mm) for each color required.
- E. Sign Schedule.
- F. Maintenance Data: For signs to include in maintenance manuals.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
- B. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.
- C. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.6 Warranty

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of embedded graphic image colors and sign lamination.
 - 2. Warranty Period: Five years from date of Substantial Completion.

1.7 PROJECT CONDITIONS

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

1.8 COORDINATION

- A. Coordinate placement of anchorage devices with templates for installing signs.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Acrylic Sheet: ASTM D 4802, Category A-1 (cell-cast sheet), Type UVA (UV absorbing).

2.2 PANEL SIGNS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. ACE Sign Systems, Inc.
 - 2. Advance Corporation; Braille-Tac Division.
 - 3. Allen Industries Architectural Signage
 - 4. Allenite Signs; Allen Marking Products, Inc.
 - 5. APCO Graphics, Inc.
 - 6. ASI-Modulex, Inc.
 - 7. Best Sign Systems Inc.

8. Bunting Graphics, Inc.
9. Fossil Industries, Inc.
10. Gemini Incorporated.
11. Grimco, Inc.
12. Innerface Sign Systems, Inc.
13. InPro Corporation
14. Matthews International Corporation; Bronze Division.
15. Mills Manufacturing Company.
16. Mohawk Sign Systems.
17. Nelson-Harkins Industries.
18. Seton Identification Products.
19. Signature Signs, Incorporated.
20. Supersine Company (The)

B. Interior Panel Signs: Provide smooth sign panel surfaces constructed to remain flat under installed conditions within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner, complying with the following requirements:

1. Acrylic Sheet: 0.080 inch (2.03 mm) thick.
2. Edge Condition: Square cut.
3. Corner Condition: Square cut.
4. Mounting: Unframed.
 - a. Wall mounted with two-face tape.
5. Color: As selected by Architect from manufacturer's full range.
6. Surface Applied, Raised Tactile Graphics: Characters and Grade 2 Braille raised 1/32 inch (0.8 mm) above surface with contrasting colors.
 - a. Applied polymer.
7. Refer to signage on drawings.

C. Tactile and Braille Sign: Manufacturer's standard process for producing text and symbols complying with ADA-ABA Accessibility Guidelines and with ICC/ANSI A117.1. Text shall be accompanied by Grade 2 Braille. Produce precisely formed characters with square-cut edges free from burrs and cut marks; Braille dots with domed or rounded shape.

1. Panel Material: Clear acrylic sheet with opaque color coating, subsurface applied.
2. Raised-Copy Thickness: Not less than 1/32 inch (0.8 mm).

D. Subsurface Copy: Apply minimum 4-mil- (0.10-mm-) thick vinyl copy to back face of clear acrylic sheet forming panel face to produce precisely formed opaque image. Image shall be free of rough edges.

E. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and are UV and water resistant for three years for application intended.

1. Color: As selected by Architect from manufacturer's full range.

2.3 FABRICATION

A. General: Provide manufacturer's standard signs of configurations indicated.

1. Preassemble signs in the shop to greatest extent possible. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation, in location not exposed to view after final assembly.

2.4 FINISHES, GENERAL

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ACRYLIC SHEET FINISHES

- A. Colored Coatings for Acrylic Sheet: For copy and background colors, provide colored coatings, including inks, dyes, and paints, that are recommended by acrylic manufacturers for optimum adherence to acrylic surface and that are UV and water resistant for three years for application intended.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.
- B. Verify that items, including anchor inserts, are sized and located to accommodate signs.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
 - 1. Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.
 - 2. Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.
- B. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply. Signs mounted at doors with sidelights shall be mounted on the sidelight glass at the latch side of the door.
 - 1. Two-Face Tape: Mount signs to smooth, nonporous surfaces. Do not use this method for vinyl-covered or rough surfaces.
 - 2. Adhesive as recommended by sign manufacturer.

3.3 CLEANING AND PROTECTION

- A. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10 1423

SECTION 102600 - WALL PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:

- 1. Corner guards.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

- 1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.

- B. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:

- 1. Corner Guards: 12 inches long.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type of exposed plastic material.

- B. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of wall and door protection product to include in maintenance manuals.

- 1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic covers under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

- 1. Corner-Guard Covers: Full-size plastic covers of maximum length equal to 2 percent of each type, color, and texture of cover installed, but no fewer than two, 96-inch- long units.

- 2. Mounting and Accessory Components: Amounts proportional to the quantities of extra materials. Package mounting and accessory components with each extra material.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store wall and door protection in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.

- 1. Maintain room temperature within storage area at not less than 70 deg F during the period plastic materials are stored.

2. Keep plastic materials out of direct sunlight.
3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F.
 - a. Store corner-guard covers in a vertical position.

1.8 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
 - b. Deterioration of metals, metal finishes, plastics, and other materials beyond normal use.
 2. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain wall- and door-protection products of each type from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 1. Flame-Spread Index: 25 or less.
 2. Smoke-Developed Index: 450 or less.
- B. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

2.3 CORNER GUARDS

- A. Surface-Mounted, Plastic-Cover Corner Guards: Manufacturer's standard, PVC-free assembly consisting of snap-on, resilient plastic cover installed over retainer; including mounting hardware; fabricated with 90-degree or odd-degree turn to match wall condition.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Acrovyn – SM-20MN for odd angles (Basis of Design).
 - b. Acrovyn – SSM-20AN for 90 degree angles (Basis of Design).
 2. Cover: Extruded rigid plastic, minimum 0.100-inch wall thickness, as follows:
 - a. Profile: Nominal 2-inch (SSM-20An) or 3-inch- long leg (SM-20MN) and 1/4-inch corner radius.
 - b. Height: 4 feet.
 - c. Color and Texture: As selected by Architect from manufacturer's full range.
 3. Retainer Rail: Extruded aluminum retainers, 6063-T6 alloy. Minimum strength and durability properties as specified in ASTM B221. Manufacturer's standard fasteners to be non-corrosive and compatible with aluminum retainers.

4. Top and Bottom Caps: Prefabricated, injection-molded plastic; color matching cover; field adjustable for close alignment with snap-on cover.

2.4 MATERIALS

- A. Plastic Materials: Chemical- and stain-resistant, high-impact-resistant plastic with integral color throughout; extruded and sheet material as required, thickness as indicated.
- B. Polycarbonate Plastic Sheet: ASTM D 6098, S-PC01, Class 1 or Class 2, abrasion resistant; with a minimum impact-resistance rating of 15 ft.-lbf/in. of notch when tested according to ASTM D 256, Test Method A.
- C. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- D. Adhesive: As recommended by protection product manufacturer.

2.5 FABRICATION

- A. Fabricate wall and door protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.
- B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.6 FINISHES

- A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of the Work.
- B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
 1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing wall and door protection.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.

3.3 INSTALLATION

- A. Installation Quality: Install wall and door protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
- B. Accessories: Provide splices, mounting hardware, anchors, trim, joint moldings, and other accessories required for a complete installation.
 - 1. Provide anchoring devices and suitable locations to withstand imposed loads.
 - 2. Where splices occur in horizontal runs of more than 20 feet, splice aluminum retainers and plastic covers at different locations along the run, but no closer than 12 inches apart.

3.4 CLEANING

- A. Immediately after completion of installation, clean plastic covers and accessories using a standard ammonia-based household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 102600

SECTION 10 2800 - TOILET ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Public-use washroom accessories.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include the following:
 - 1. Construction details and dimensions.
 - 2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
 - 3. Material and finish descriptions.
 - 4. Features that will be included for Project.
 - 5. Manufacturer's warranty.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.
 - 1. Identify locations using room designations indicated.
 - 2. Identify products using designations indicated.

1.4 INFORMATIONAL SUBMITTALS

- A. Warranty: Sample of special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For toilet and bath accessories to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Source Limitations: For products listed together in the same Part 2 articles, obtain products from single source from single manufacturer.

1.7 COORDINATION

- A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.
- B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, 0.031-inch (0.8-mm) minimum nominal thickness unless otherwise indicated.
- B. Brass: ASTM B 19, flat products; ASTM B 16/B 16M, rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.
- C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.036-inch (0.9-mm) minimum nominal thickness.
- D. Galvanized-Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.
- E. Galvanized-Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.
- G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.
- I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following, unless otherwise noted:
 - 1. American Specialties, Inc
 - 2. Bobrick Washroom Equipment, Inc.
 - 3. Bradley Corporation.
 - 4. Georgia-Pacific
- B. Liquid-Soap Dispenser:
 - 1. Impact 9325 Foam-eeze
 - 2. Description: Designed for dispensing soap in liquid or lotion form.
 - 3. Mounting: Vertically oriented, surface mounted.
 - 4. Finish: White
 - 5. Lockset: Tumbler type.
 - 6. Refill Indicator: Window type.
- C. Paper Towel Dispenser
 - 1. Bobrick B-72974
 - 2. Description: Automatic, Universal Surface- Mounted Roll Towel Dispenser
 - 3. Mounting: Surface mounted.
 - 4. Color: Smoke

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
- B. Grab Bars: Install to withstand a downward load of at least 250 lbf (1112 N), when tested according to ASTM F 446.

3.2 ADJUSTING AND CLEANING

- A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.
- B. Remove temporary labels and protective coatings.
- C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION 10 2800

SECTION 103100 – ELECTRIC FIREPLACES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Electric fireplaces and accessories including the following:
 - 1. Manufactured indoor electric fireplaces.
 - 2. Electric fireplace accessories.

1.2 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 26 05 00 – Basic electrical materials and methods.

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00 - Administrative Requirements.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Provide drawing of required clearances, rough-in of enclosure and utilities.
 - 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and finishes.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
- B. Installer Qualifications: Minimum 2 year experience installing similar products.

1.5 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
- B. Handling: Handle materials to avoid damage.

1.7 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 recommended limits.

1.8 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.9 WARRANTY

- A. Warranty: Provide manufacturer's standard warranty against defects in materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: SimpliFire; 7571 215th Street West, Lakeville, MN 55044 888-427-3973
- B. Requests for substitutions will be considered.

2.2 MANUFACTURED MODERN INDOOR ELECTRIC FIREPLACES

- A. Compliance - General:
 - 1. Comply with applicable building codes.
- B. Scion 55" Clean Face Linear Electric Fireplace:
 - 1. Controls:
 - a. Wall Switch, with thermostat set to lowest setting of 750W
 - b. Remote: Provide to owner
 - 2. Media: Clear Crystals

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

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

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions and the requirements of authorities having jurisdiction.
- B. Anchor all components firmly in position for long life under hard use.

3.4 FIELD QUALITY CONTROL

- A. Upon completion of installation, visually inspect all exposed surfaces. Touch up scratches and abrasions with touch-up paint recommended by the manufacturer, make imperfections invisible to the unaided eye from a distance of 5 feet (1.5m).
- B. Test for proper operation, control and safety devices.
- C. Complete Installer's Warranty Validation Card.

3.5 PROTECTION

- A. Protect installed products until completion of project.

END OF SECTION 103100

SECTION 12 3661.16 - SOLID SURFACING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Solid surface material countertops.

1.3 ACTION SUBMITTALS

- A. Product Data: For countertop materials.
- B. Shop Drawings: For countertops. Show materials, finishes, edge profiles, and methods of joining.
 - 1. Show locations and details of joints.
 - 2. Show direction of directional pattern, if any.

1.4 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For solid surface material countertops to include in maintenance manuals. Include Product Data for care products used or recommended by Installer and names, addresses, and telephone numbers of local sources for products.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Fabricator of countertops

1.6 FIELD CONDITIONS

- A. Field Measurements: Verify dimensions of countertops by field measurements before fabrication is complete.

PART 2 - PRODUCTS

2.1 SOLID SURFACE SILL AND APRON MATERIALS

- A. Solid Surface Material: Homogeneous-filled plastic resin complying with ICPA SS-1.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Formica Corporation.
 - b. Wilsonart International Holdings, Inc.
 - c. Corian – Silver Birch (Basis of Design).
2. Type: Provide Standard type unless Special Purpose type is indicated.
3. Colors and Patterns: As selected by Architect from manufacturer's full range. Up to and including Price Group 4.

2.2 COUNTERTOP FABRICATION

- A. Fabricate countertops according to solid surface material manufacturer's written instructions and to the AWI/AWMAC/WI's "Architectural Woodwork Standards."
 1. Grade: Custom.
- B. Configuration:
 1. Front: Straight, slightly eased at top with separate apron, 4 inches high, recessed behind front edge as detailed.
- C. Sills and Aprons: 1/4-inch thick, solid surface material.
- D. Countertops: 1/2 inch thick solid surface material.
- E. Fabricate countertops with shop-applied edges unless otherwise indicated. Comply with solid surface material manufacturer's written instructions for adhesives, sealers, fabrication, and finishing.
 1. Fabricate with loose aprons, backsplashes, and side splashes for field assembly.
- F. Joints: Fabricate countertops and aprons without joints.

2.3 INSTALLATION MATERIALS

- A. Adhesive: Product recommended by solid surface material manufacturer.
 1. Adhesives shall have a VOC content of 70 g/L or less.
 2. Adhesive shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
- B. Sealant for Countertops and Aprons: Comply with applicable requirements in Section 079200 "Joint Sealants."

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to receive solid surface material countertops and aprons and conditions under which they will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of countertops.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install countertops and aprons level to a tolerance of 1/8 inch in 8 feet, 1/4 inch maximum. Do not exceed 1/64-inch difference between planes of adjacent units.
- B. Secure countertops and aprons to substrates with adhesive according to solid surface material manufacturer's written instructions. Align adjacent surfaces and, using adhesive in color to match countertop, form seams to comply with manufacturer's written instructions. Carefully dress joints smooth, remove surface scratches, and clean entire surface. Mask areas of countertops adjacent to joints to prevent adhesive smears
- C. Apply sealant to gaps at walls; comply with Section 079200 "Joint Sealants."

END OF SECTION 123661.16

SECTION 22 0500 - COMMON WORK RESULTS FOR PLUMBING

PART 1 – GENERAL PROVISIONS

1.1 CONTRACT DOCUMENTS

- A. All contract documents including drawings, alternates, addenda and modifications preceding this division of this specification are applicable to contractors, subcontractors, and material suppliers.

1.2 SPECIFICATION FORM AND DEFINITIONS

- A. These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as "the contractor shall", "shall be", "as noted on the Drawings", "according to the drawings", "a", "an", "the" and "all" are intentional. Omitted words and phrases shall be supplied by inference.
- B. The term "Engineer", "Engineer", or "Engineer" wherever used in these specifications, shall mean LATIMER, SOMMERS & ASSOCIATES, P.A., 3639 SW SUMMERFIELD DRIVE, SUITE A, TOPEKA, KANSAS 66614, PHONE 785-233-3232, FAX 785-233-0647.
- C. Contractor, wherever used in these specifications, shall mean the Company that enters into contract with Owner to perform this work.
- D. When a word, such as "proper", "satisfactory", "equivalent", and "as directed", is used, it requires Engineer's review.
- E. "Provide" means furnish and install.
- F. Engineer hereinafter abbreviated A/E shall mean both the Design Engineers and the Design Engineers.
- G. Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.
- H. When the term "equivalent" is used in context to products or manufacturer's, the equivalency of the proposed product or manufacturer to be used in lieu of the specified product or manufacturer is the sole decision of the A/E.

1.3 QUALIFICATIONS

- A. The contractor responsible for work under this section shall have completed a job of similar scope and magnitude within the last 3 years. The contractor shall employ an experienced, competent and adequate work force licensed in their specific trade and properly supervised at all times. Unlicensed workers and general laborers shall be adequately supervised to insure competent and quality work and workmanship required by this contract and all other regulations, codes and practices. At all times the contractor shall comply with all applicable local, state and federal guidelines, practices and regulations. Contractor may be required to submit a statement of qualifications upon request before any final approval and selection. Failure to be able to comply with these requirements is suitable reason for rejection of a bid.

1.4 LOCAL CONDITIONS

- A. Visit site and determine existing local conditions affecting work in contract.
- B. Failure to determine site conditions or nature of existing or new construction will not be considered a basis for granting additional compensation.

1.5 CONTRACT CHANGES

- A. Changes or deviations from Contract, including those for extra or additional work must be submitted in writing for review of Engineer. No verbal orders will be recognized.

1.6 LOCATIONS AND INTERFERENCES

- A. Location of equipment, piping and other mechanical work is indicated diagrammatically on the Drawings. Determine exact locations on job, subject to structural conditions, work of other sections of the Specifications, access requirements for installation and maintenance and approval of Engineer.
- B. Study and become familiar with the Drawings of other trades and in particular the general construction plans and details in order to obtain necessary information for figuring installation. Cooperate with work of other trades, and install work in such a way as to avoid interference with work of other trades. Minor deviations, not affecting design characteristics, performance or space limitation may be permitted if reviewed by Engineer prior to installation.
- C. Any pipe, apparatus, appliance or other item interfering with proper placement of other work as indicated on Drawings, specified, or required, shall be removed and if so shown, relocated and reconnected without extra cost. Damage to new or existing work caused by Contractor shall be restored as specified for new work.
- D. Do not scale Drawings for dimensions. Accurately lay-out work from dimensions indicated on Drawings unless such be found in error.
- E. Report any conflict stated above to supervisor for coordination.

1.7 PERFORMANCE

- A. Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus and appliances operate satisfactorily as designed and intended. Work shall include required adjustment of systems and control equipment installed under this specification division.

1.8 TEMPORARY UTILITIES

- A. Contractor shall provide temporary utilities during construction.

1.9 WARRANTY

- A. The plumbing systems are to be warranted to Owner and Engineer the quality of materials, equipment, workmanship and operation of equipment provided under this specification division for a period of one year from acceptance of electrical systems by Owner.
- B. Contractor warrants to Owner and Engineer that on receipt of notice from either of them within one year of warranty period following date of acceptance all defects that have appeared in materials and/or workmanship, shall be promptly corrected to condition required by contract documents at contractor expense.
- C. The warranty above expressed shall not supersede any separately stated warranty or requirements required by law or by these specifications.

1.10 ALTERNATES

- A. Refer to General Requirements and description for alternate bid items.

PART 2 - PRODUCTS

2.1 MATERIALS, EQUIPMENT AND SUBSTITUTIONS

- A. The intent of these specifications is to allow ample opportunity for bidder to use its ingenuity and abilities to perform the work to its and the Owner's best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.
- B. Material and equipment provided shall be first class quality, new, unused and without damage unless noted otherwise.
- C. In general, these specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and specifications. The manufacturer's product, series, model, catalog and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer's products. Where other manufacturer's names are listed they are considered an approved manufacturer for the product specified, however; the listing of their names implies no prior approval of any product they may propose to furnish as equivalent to the first named product unless specific model or catalog numbers are listed in these specifications or in subsequent addenda. Where other than first named products are used for base bid proposal it shall be the responsibility of the Contractor to determine prior to bid time that the proposed materials and equipment selections are products of approved manufacturers which meet or exceed the specifications and are acceptable to the Engineer.
- D. Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to Engineer for review prior to procurement.
- E. Prior to receipt of bids, if the Contractor wishes to incorporate products other than those named in the specifications or drawings they shall submit a request for approval of equivalency in writing to the A/E no later than (10) ten calendar days prior to bid date. Engineer will review requests and acceptable items will be listed in an Addendum issued to principal bidders. Equivalentents will ONLY be considered approved when listed by project addendum. Substitutions after this may be refused at Engineers option.
- F. Materials and equipment proposed for substitution shall be equal to or superior to that specified in construction, efficiency, utility, aesthetic design, and color as determined by Engineer whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access for installation and maintenance. Requests must be accompanied by two (2) copies of complete descriptive and technical data including manufacturer's name, model and catalog number, photographs or cuts, physical dimensions, operating characteristics and any other information needed for comparison. .In proposing a substitution prior to receipt of bids, include in such proposal cost of altering other elements of project, including adjustments in mechanical/electrical service requirements necessary to accommodate such substitution.
- G. In proposing a substitution prior to receipt of bids, include in such bid all costs of altering other elements of the project, including such items as adjustments in mechanical/electrical service requirements necessary to accommodate such substitutions. In addition, all physical space and weight requirements requiring additional structural support, modifications to the base floor plans, equipment concrete pad/roof curb dimensions shall be incorporated as required into such bid to accommodate such substitutions.
- H. Within ten (10) working days after bids are received, apparent low bidder shall submit to A/E for approval three copies of a list of all major items of equipment he intends to provide. As soon as practicable and within ten (10) working days after award of contract, Contractor shall submit shop drawings for equipment and materials to be incorporated in work for Engineer's review. Where ten (10) working day limit is insufficient for preparation of detailed shop drawings on major equipment or assemblies, Contractor shall submit manufacturer's descriptive catalog data and indicate date such detailed shop drawings will be submitted along with manufacturer's certifications that order was placed within ten (10) working day limit.

PART 3 EXECUTION

3.1 SHOP DRAWINGS

- A. Contractor shall furnish shop drawings of all materials and equipment. Submittals shall be submitted electronically. In addition, a minimum of (3) paper copies of any submittal that contains informational drawings or documentation that is in a format larger than 8-1/2 x 11 shall be submitted to the A/E. A/E will return the submittals to the Contractor electronically except that a copy of large format submittals will be returned to the contractor via mail. A copy of fully processed product data submittal shall be included as a part of each operating and maintenance manual.
- B. Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, fitting sizes, etc., that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these specifications, or Drawing sheet number when item does not appear in specifications. Where equipment submitted does not appear in specifications or specified equivalent, mark submittals with applicable alternate numbers, change order number or letters of authorization. Each submittal shall contain at least four sets of original catalog cuts. Each catalog sheet shall bear Equipment Manufacturer's name and address. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.
- C. Contractor shall be required to submit all applicable equipment/material assembly mock-ups as required by the Contract Documents for Engineer approval. Contractor shall provide changes and resubmit mock-ups until Engineer is satisfied final product meets or exceeds stated specifications and quality of specified product.
- D. Contractor shall check all shop drawings to verify that they meet specifications and/or drawings requirements before forwarding submittals to the Engineer for their review.
- E. All shop drawings submitted to Engineer shall bear Contractor's approval stamp which shall indicate that Contractor has reviewed submittals and that they meet specification and drawing requirements. Contractor's submittal review shall specifically check for but not be limited to the following: equipment capacities, physical size in relation to space allowed, electrical characteristics, provisions for supply, return and drainage connections to building systems. All shop drawings not meeting Contractor's approval shall be returned to its supplier for resubmittal.
- F. No shop drawing submittals will be considered for review by the Engineer without Contractor's approval stamp, or that have extensive changes made on the original submittal as a result of Contractor's review. All comments or minor notations on shop drawings shall be flagged to indicate originator of comment.
- G. Engineer will not be responsible for or the cost of returning shop drawing submittals that are submitted without Contractor's review and approval stamp. A letter will be sent to Contractor by either the Engineer or Engineer indicating receipt of an improper submittal for pick-up by Contractor or supplier for 15 working days after date of receipt. If not picked up by the 16th working day, submittals not bearing Contractor's review and approval stamp will be disposed of by Engineer.
- H. Engineer's review of shop drawings will not relieve Contractor of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing by Owner or its representative, nor shall it relieve Contractor of responsibility for errors in shop drawings. No work shall be fabricated until Engineer's review has been obtained with "no exceptions" or "as noted" language. Any time delay caused by correcting and resubmitting shop drawings will be Contractor's responsibility.
- I. The preparation of coordination drawings are not a requirement of the project unless otherwise indicated on the drawings. It is strongly recommended, however, that the various contractors work together to prepare detailed coordination drawings in an effort to minimize conflicts created as the various trades install their particular portion of the work. The design team will assist the contractor in resolving coordination conflicts

by reviewing these coordination drawings; however, this review will not constitute any approval of said drawings. There will be no additional compensation for deviations in pipe, ductwork or conduit routing required to achieve coordination of the material and equipment scheduled or indicated to be installed as a part of the project. There will be no additional compensation for the rework of pipe ductwork or conduit should this become required as a result of a lack of coordination between the various trades.

- J. Contractor shall submit the following items for this project:
1. All valves
 2. All domestic water piping and all associated hangers/mounting devices
 3. All piping insulation
 4. All plumbing fixtures, carriers etc.
 5. All drain, waste and vent piping
 - Domestic water heaters
 - Pumps
 - Expansion tank
 6. All plumbing specialties including but not limited to cleanouts etc.

3.2 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

- A. Submit an outline copy of installation, operating, and maintenance manuals for review and comment.
- B. Submit three copies of installation, operating, maintenance instructions, and parts lists for equipment provided. After receiving comments from outline review. Instructions shall be prepared by equipment manufacturer.
- C. Keep in safe place, keys and wrenches furnished with equipment under the Contract. Present to Owner and obtain receipt for same upon completion of project.
- D. Prepare a complete notebook, covering systems and equipment provided and installed under this contract. Submit notebooks to Engineer for review before delivery to Owner. Contractor at his option may prepare this notebook, or retain an individual to prepare it for him. Contractor shall include cost of this service in bid. Notebook shall contain following:
1. Certified equipment drawings/or catalog data with equipment provided clearly marked as outlined under this specification.
 2. Complete installation, operating, maintenance instructions and parts lists for each item of equipment.
 3. A complete set of approved final shop drawings.
 4. Special emergency operating instructions with a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to various parts of the systems installed.
 5. As-Built Drawings: The Contractor shall mark up a set of contract documents during construction noting all changes and deviations including change orders. These will be delivered to A/E at end of the project for review and correction as required. After the originals are changed to reflect the blue line set, a complete set of reproducible set of project record drawings drawn at the original scale indicated shall be included in the brochure.
 6. All required warranties and guarantees, including start and end date of warranties/guarantees.
- E. Provide notebooks bound in black vinyl three-ring binders. Reinforce binding edge of each sheet of looseleaf type brochure to prevent tearing from continued usage. Clearly print on label insert of each brochure:
1. Project name and address.
 2. Section of work covered by brochure, e.g. "Plumbing", etc.

- F. In addition to the hard copy of the operating and maintenance manuals, submit an electronic copy. The electronic copy shall be submitted either on compact disc, DVD or flash drive.

3.3 CUTTING AND PATCHING

- A. Contractor shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Engineer's approval and in an approved manner.
- B. Patching shall be by mechanics of particular trade involved and shall meet approval of Engineer.
- C. Drilling and cutting of openings through building materials requires Engineer's review and approval. Make openings in concrete with concrete hole saw or concrete drill. Use of star drill or air hammer for this work is not acceptable.

3.4 MUTILATION

- A. Mutilation of building finishes or existing/new equipment, caused by demolition or installation of new work shall be repaired at Contractor's expense to approval of Engineer.

3.5 WALL PENETRATIONS

- A. Include the installation of all boxes, access panels and sleeves for openings required to install the work. All floor and wall penetrations shall be sealed to meet fire rating requirements using materials tested in accordance with ASTM E814.

3.6 OPENINGS, ACCESS PANELS & SLEEVES

- A. Include the installation of all boxes, access panels and sleeves for openings required to install this work, except structural openings incorporated in the structural drawings. Sleeves shall be installed for all pipes passing through structural slabs and walls. Set and verify the location of sleeves as shown on structural plans that pass through beams, only if so shown. All floor and wall penetrations be sealed to meet fire rating requirements. Access panels shall include those required to access fire dampers, VAV boxes, valves, smoke dampers, pipe chases, manual and automatic dampers, etc. Locations and sizes of panels are to be determined by the contractor and are not specifically shown on the drawings.

3.7 FIRE STOPPING

- A. All holes or voids created by the mechanical Subcontractor to extend pipe through fire rated floors and walls and shall be sealed with an intumescent material capable of expanding up to 8 to 10 times when exposed to temperatures of 250 degrees F. It shall be ICBO, BOCAI and SBCCI (NRB 243) approved ratings to 3 hours per ASTM E-814 (UL 1479). Acceptable Material: 3M Fire Barrier Caulk, putty, strip and sheet forms. Equivalent by SpecSeal.
- B. Submit for review firestopping methods and sleeve drawings indicating all required application, methods and sleeves. Refer to engineering drawing for locations of fire rated partitions and floors.
- C. All wall and floor penetrations will require firestopping.

3.8 SETTING, ADJUSTMENT AND EQUIPMENT SUPPORTS

- A. Work shall include mounting, alignment and adjustment of systems and equipment. Set all equipment level on adequate supports and provide proper anchor bolts and isolation as shown or specified. Equipment failures resulting from improper installation or field alignment shall be repaired or replaced by Contractor at no cost to Owner.

- B. Provide each piece of equipment or apparatus suspended from ceiling or mounted above floor level with suitable structural support, platform or carrier in accordance with best recognized practice. Contractor shall arrange for attachment to building structure, unless otherwise indicated on drawings or as specified. Provide hangers with vibration eliminators where required. Contractor shall verify that structural members of building are adequate to support equipment. Submit details of hangers, platforms and supports together with total weights of mounted equipment to Engineer for review before proceeding with fabrication or installation.

3.9 START-UP, CHANGEOVER, TRAINING AND OPERATION CHECK

- A. Contractor shall be responsible for training Owner's operating personnel to operate and maintain systems and equipment installed. Keep a record of training provided to Owner's personnel listing the date, subject covered, instructor's name, names of Owner's personnel attending and total hours of instruction given each individual.
- B. All owner training sessions shall be orderly and well organized and shall be professionally video recorded using digital format. Contractor shall produce a DVD or flash drive of each training session and submit to Owner as part of the Operation and Maintenance Manual submittal.

3.10 PRE-FINAL AND FINAL CONSTRUCTION REVIEW

- A. At Contractor's request, Engineer will make pre-final construction review to determine if to the best of its knowledge project is completed in accordance with Contract Documents.
- B. Items found by Engineer as not complete or not in accordance with requirements of contract will be outlined in report to Engineer for forwarding to Subcontractors. Subcontractor shall complete and/or correct these items, before notifying Engineer it is ready for final review.
- C. All necessary system adjustments, including air systems balancing, shall be completed and all specified records and reports submitted in sufficient time to be received by Engineer at least ten working days prior to date of final construction review.
- D. At final construction review, Contractors shall be present or shall be represented by a person of authority. Each shall demonstrate, as directed by Engineer that work complies with purpose and intent of contract documents and shall provide labor, services, instruments or tools necessary for such demonstrations and tests.

END OF SECTION 22 0500

SECTION 22 0501 - EXTENT OF CONTRACT WORK AND CODES

PART 1 - GENERAL (Reference Section 220500)

1.1 GENERAL EXTENT OF WORK INCLUDED IN CONTRACT

- A. Provide plumbing systems indicated on Drawings, specified or reasonably implied. Provide every device and accessory necessary for proper operation and completion of plumbing systems. In no case will claims for "Extra Work" be allowed for work about which Contractor could have been informed before bids were taken.
- B. Become familiar with equipment provided by other Subcontractors which require plumbing connections and controls.
- C. Electrical work required to install and control plumbing equipment which is not indicated on Drawings or specified under Division 26 shall be included.
- D. The cost and provision of larger wiring, conduit, control, and protective devices resulting from installation of equipment which was not used for basis of design as outlined in specifications shall be provided at no increase in contract price.
- E. Provide supervision to subcontractor to insure that required connections, interlocking and interconnection of mechanical and electrical equipment are made to attain intended control sequences and system operation.
- F. Furnish electrical wiring diagrams to Engineer and three Electrical Subcontractor. Diagrams shall show factory and field wiring of components and controls. Control devices and field wiring to be provided by Electrical Subcontractor shall be clearly indicated by notation and drawing symbols on wiring diagrams.
- G. Obtain complete electrical data on mechanical shop drawings and list this data on an approved form which shall be presented monthly or on request, to Electrical Subcontractor. Data shall be complete with wiring diagrams received to date and shall contain necessary data on electrical components of plumbing equipment such as capacity, HP, voltage, amperes, watts, locked rotor current to allow Electrical Subcontractor to order electrical equipment.

1.2 CODES, ORDINANCES, RULES AND REGULATIONS

- A. Provide work in accordance with applicable rules, codes, ordinances and regulations of Local, State, Federal Governments, and other authorities having lawful jurisdiction.
- B. Conform to latest editions and supplements of codes, standards or recommended practices as indicated on code footprint.
- C. Drawings and specifications indicate minimum construction standard, should any work indicated be sub-standard to any ordinances, laws, codes, rules or regulations bearing on work, Contractor shall promptly notify Engineer in writing before proceeding with work so that necessary changes can be made. However, if Contractor proceeds with work knowing it to be contrary to any ordinances, laws, rules, and regulations he shall thereby have assumed full responsibility for and shall bear all costs required to correct non-complying work.
- D. Contractor shall secure and pay for necessary permits and certificates of inspection required by governmental ordinances, laws, rules or regulations. Keep a written record of all permits and inspection certificates and submit two copies to Engineer with request for final review.

PART 2 - PRODUCTS

2.1 DRAWINGS

- A. Drawings are to be considered diagrammatic for all systems. All plumbing fixtures require waste, water and vent connections and they should be provided. Contractor shall include in bid costs to provide systems which will avoid and coordinate will all other building trades and systems.

END OF SECTION 22 0501

SECTION 22 0550 – IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 REQUIRED WORK

- A. Provide the reasonable identification of Plumbing piping as specified below.

PART 2 - PRODUCTS

2.1 PIPING IDENTIFICATION

- A. Identify piping for all new domestic water piping at intervals indicated below. Provide color coded stencil markings for each type of pipe utilized and provide flow direction arrows. Provide standard stencils, prepared with letter sizes conforming to recommendations of ASME A13.1. Stencil paint shall be exterior use, oil-based, alkyd gloss enamel in colors according to ASME A13.1. Paint may be in pressurized spray-can form.
- B. All letter stenciling shall be minimum 1-1/4" high. Colors and wording shall be as directed by the Owner, using standard colors and standard abbreviations of all services being identified. Contractor shall submit for approval list of colors and wording prior to purchase of pipe marking equipment/material/installation. Pipe markers shall meet applicable ANSI Standard and OSHA requirements.

<u>Piping Section</u>	<u>Pipe Identification Spacing (max spacing)</u>
Within building	8'-0" on center

END OF SECTION 22 0550

SECTION 22 1100 – DOMESTIC WATER DRAIN, WASTE, AND VENT PIPING

PART 1 - GENERAL (Reference Section 220500)

PART 2 - PRODUCTS

2.1 PIPING MATERIALS AND FITTINGS

- A. Piping used throughout project shall conform to the following specifications. Piping shall be plainly marked with manufacturers name and weight. All materials listed may not be required on this project. See piping material schedule on the plans for materials to be used for each piping system. Piping materials shall be as follows:
 - B. Hubless Cast Iron Soil Pipe:
 - 1. Pipe and fittings shall be gray cast iron with spigot bead and positioning lug. Pipe and fittings shall be coated inside and out with asphaltum preservative and shall meet requirements of current Cast Iron Pipe Institute Standard 301-69T.
 - 2. Pipe joints shall be heavy-duty, no-hub joint couplings consisting of neoprene rubber sleeve, stainless steel shield and clamp assembly. ASTM A 74 “Extra Heavy” class.
 - 3. Pipe and fittings shall be by Alabama Pipe, Tyler Pipe or Charlotte.
 - 4. Pipe couplings shall be ANACO “Husky” or equal.
 - C. PVC Soil Pipe and Fittings:
 - 1. Pipe and fittings shall be manufactured from PVC compound with a cell class of 12454 per ASTM D 1784 and conform with National Sanitation Foundation (NSF) standard 14.
 - 2. Pipe shall be iron pipe size (IPS) conforming to ASTM D 1785 and ASTM D 2665. Injection molded fittings shall conform to ASTM D 2665. Fabricated fittings shall conform to ASTM F 1866.
 - 3. All pipe and fittings to be produced by a single manufacturer and to be installed in accordance with manufacturer’s recommendations and local code requirements.
 - 4. Solvent cements shall conform to ASTM D 2564. Primer shall conform to ASTM F 656.
 - 5. Pipe and Fittings shall be manufactured by Charlotte Pipe and Foundry Co.
 - D. Copper Tube:
 - 1. Provide hard temper copper water tube conforming to requirements of current ASTM Specification B-88. Tubing shall be Type K, L, or M as listed in schedule.
 - 2. Tubing joints shall be soldered or brazed. See schedule for joining method to be used.
 - 3. Provide wrought solder joint fillings conforming to ANSI Standard B16.22.
 - 4. T-Drill is not approved for this project.
 - 5. Pipe by Anaconda, Cerro, Chase, Mueller.

2.2 PIPING FITTINGS

- A. Piping fitting used throughout project shall be proper type for installation method used and shall be compatible with piping system material. Fittings listed in piping material schedule.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Piping systems materials and installation shall conform with the following standards and codes.

System: Plumbing System Piping
Code: International Association of Plumbing & Mechanical Officials' "Uniform Plumbing Code"

- B. Pipe sizes indicated on plans and as specified refer to nominal size in inches for steel pipe, cast iron pipe and copper tubing, unless otherwise indicated. Pipes are sized to nearest 1/2". In no case shall piping smaller than size specified be used.
- C. Contractor shall provide and be responsible for proper location of pipe sleeves, hangers, supports, and inserts. Install hangers, supports, inserts, etc., as recommended by manufacturer and as specified and detailed on drawings. Verify construction types and provide proper hangers, inserts and supports for construction used. Install inserts, hangers and supports in accordance with manufacturers load ratings and provide for thermal expansion of piping without exceeding allowable stress on piping or supports. Provide solid type hangers and supports where pipe travel exceeds manufacturer's recommendations for fixed hanger and supports.
- D. Install piping parallel with building lines and parallel with other piping to obtain a neat and orderly appearance of piping system. Secure piping with approved anchors and provide guides where required to insure proper direction of piping expansion. Piping shall be installed so that allowable stress for piping, valves and fittings used are not exceeded during normal operation or testing of piping system.
- E. Provide piping materials and wall thickness for specific piping systems as listed in piping schedule at end of this Section.
- F. Provide unions or flanged joints in each pipe line preceding connections to equipment to allow removal for repair or replacement. Provide all screwed and control valves with unions adjacent to each piping connection. Provide screwed end valves with union adjacent to valve unless valve can be otherwise easily removed from line.
- G. Piping fitting materials for specific piping systems shall be as listed in piping schedules. Fitting shall be approved factory made type with threaded or weld ends as required. Fittings pressures and temperature ratings shall be equal to or exceed maximum operating temperature and working pressure of piping system. No mitered or field fabricated pipe fittings will be permitted.
- H. Brazed socket type joints shall be made with suitable brazing alloys. Minimum socket depth shall be sufficient for intended service. Brazing alloy shall be end fed into socket, and shall fill completely annular clearance between socket and pipe or tube. Brazed joints depending solely upon a fillet rather than a socket type joint will not be acceptable.
- I. Soft soldered socket type joints shall be made with sill-floss or 95-5 tin-antimony solder as required by temperature and pressure rating of piping system or as indicated on schedules. Soldered socket-type joints shall be limited to systems containing non-flammable and non-toxic fluids. Soldered socket-type joints shall not be used on piping systems subject to shock vibration. Soldered joints depending solely upon a fillet rather than a socket-type joint will not be acceptable.
- J. Make changes in piping size and direction with approved factory made fittings.

- K. Flanges in copper piping systems shall have a minimum rating of 150 PSIG. Flanges with a pressure rating of 125 PSIG will not be allowed.
- L. Refer to schedules on plans for piping and fitting materials, additional installation requirements and for testing requirements for each application.

END OF SECTION 22 1100

SECTION 22 1300 – HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL (Reference Section 220500)

PART 2 - PRODUCTS

2.1 PIPE SLEEVES AND SEALS

- A. Pipe insulation shall run continuous through pipe sleeves with 1/4" minimum clearance between insulation and pipe sleeve. Provide metal jackets over insulated pipes passing through fire walls, floors and smoke partitions. Jacket shall be 0.018 stainless steel extending 12 inches on either side of barrier and secured to insulation with 3/8" wide band. Seal annular space between jacket and pipe sleeves by installing backing rod and 3M. Hilti or equal fire barrier caulk.
- B. Pipe wall penetrations exposed to view shall have tight fitting escutcheons or flanges to cover all voids around openings.

2.2 PIPE HANGERS AND SUPPORTS

- A. Provide and be responsible for locations of piping hangers, supports and inserts, etc., required for installation of piping under this contract. Design of hangers and supports shall conform to current issue of Manufacturers Standardization Society Specification (MSS) SP-58.
- B. Pipe hangers shall be capable of supporting piping in all conditions of operation. They shall allow free expansion and contraction of piping, and prevent excessive stress resulting from transferred weight being induced into pipe or connected equipment. Support horizontal or vertical pipes at locations of least vertical movement.
- C. Where horizontal piping movements are such that hanger rod angularity from vertical is greater than 4 degrees from cold to hot position of pipe, offset hanger, pipe, and structural attachments to that rod is vertical in hot position. Hangers shall not become disengaged by movements of supported pipe.
- D. Provide sufficient hangers to adequately support piping system at specified spacing, at changes in piping direction and at concentrated loads. Hangers shall provide for vertical adjustment to maintain pitch required for proper drainage, and for longitudinal travel due to expansion and contraction of piping. Fasten hangers to building structural members wherever practicable.
- E. Unless indicated otherwise on drawings support horizontal copper tubing as follows:

<u>NOM. TUBING SIZE</u>	<u>ROD DIAMETER</u>	<u>MAXIMUM SPACING</u>
Up to 1"	3/8"	6Ft.
1-1/4" to 1-1/2"	3/8"	8 Ft.
2" and larger	3/8"	9 Ft.

- F. Provide continuous threaded electro galvanized hanger rods wherever possible. No chain, wire, or perforated straps shall be used. Hanger rods shall be subject to tensile loading only, where lateral or axial pipe movement occurs provide suitable linkage to permit swing. Provide pipe support channels with galvanized finish for concealed locations and painted finish for exposed locations. Submit design for multiple pipe supports indicating pipe sizes, service and support detail to Engineer for review prior to fabrication.

G. Provide Grinnell pipe hangers for vertical pipe risers as follows:

<u>PIPE MATERIAL</u>	<u>PIPE SIZE</u>	<u>HANGER FIG. NO.</u>
Copper	1/2" thru 4"	CT-121
Cast Iron	1-1/2" thru 4"	261

H. Support horizontal cast iron soil pipe with two hangers for each section located close to each hub. Use minimum 5/8" hanger rod for each hanger.

I. Support vertical cast iron soil pipe at every floor, steel and copper tubing at every other floor except where indicated otherwise on drawings.

J. Provide Grinnell Fig. 194, 195, or 199 steel wall brackets for piping suspended or supported from walls. Brackets shall be prime coated carbon steel.

K. Mount hangers for insulated piping on outside of pipe insulation sized to allow for full thickness of pipe insulation. Provide Grinnell Fig. 167 insulation protection shields sized so that line compressive load does not exceed one-third of insulation compressive strength. Shield shall be galvanized steel and support lower 180 degrees of pipe insulation on copper tubing. Provide wood block at each pipe hanger in thickness of insulation. Insulation vapor barrier jacket shall overlap wood block to maintain vapor barrier.

L. Structural attachments for pipe hangers shall be as follows:

1. Concrete Structure: Provide expansion bolt or drop in expansion anchor for loads up to 400 lbs. unless otherwise noted on plans.
2. Structural steel beam: Provide Grinnell 133, 228 or equal as required by application.

M. Provide Grinnell pipe hangers for horizontal single pipe runs as follows:

<u>PIPE MATERIAL</u>	<u>PIPE SIZE</u>	<u>HANGER FIG. NO.</u>
Copper	1/2" thru 4"	CT-65
Cast Iron	1-1/2" thru 4"	260

N. Provide Grinnell Fig. 296 vibration control hangers at locations where piping vibrations would be transmitted to building structure by conventional hangers. Apply hangers within their load supporting range.

O. Provide necessary structural steel and attachment accessories for installations of pipe hangers and supports. Where heavy piping loads are to be attached to building structure verify structural loading with Engineer prior to installations.

2.3 EQUIPMENT ANCHORS

A. Provide floor or foundation mounted equipment with concrete expansion anchors.

B. Anchors shall be proper type and size recommended by manufacturer for equipment to be anchored.

C. Equivalent hangers by Autogrip, B-Line, CHD Inc., or Power Strut.

END OF SECTION 22 1300

SECTION 22 1400 – GENERAL–DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Provide necessary valves within piping systems to provide required flow control and to allow isolation for inspection, maintenance and repair of each piece of equipment or fixture, and on each main and branch service loop.
- B. Valves installed in piping systems shall be compatible with system maximum test pressure, pipe materials, pipe joining method, and fluid or gas conveyed in system.
- C. Valves 2" and smaller shall have soldered or screwed end connections as required by piping materials unless otherwise specified or shown on drawings. Install union connection in the line within two feet of each screw end valve unless valve can be otherwise easily removed from line. Valves 2-1/2" and over shall have flange end connections.
- D. Each valve shall be installed so that it is easily accessible for operation, visual inspection, and maintenance.
- E. All valve type used in plumbing systems shall be equivalent valves listed on current comparison charts of specified valve manufacturers by Crane, Centerline, Dyna Quip, Demco, Hammond, Jenkins, Jamesbury, Keystone, or Powell will be acceptable.

PART 2 - PRODUCTS

2.1 BALL VALVES

- A. Provide valves based on sizes, piping system served, and piping material indicated in the valve schedule shown on plans.

2.2 CHECK VALVES

- A. Provide valves based on sizes, piping system served, and piping material indicated in the valve schedule shown on plans.

2.3 BALANCE VALVES

- A. Provide valves based on sizes, piping system served, and piping material indicated in the valve schedule shown on plans.

END OF SECTION 22 1400.

SECTION 22 1500 – PLUMBING PIPING INSULATION

PART 1 - GENERAL (Reference Section 220500)

1.1 GENERAL REQUIREMENTS

- A. Provide necessary materials and accessories for installation of insulation for plumbing systems as specified and/or detailed on drawings insulation type, jacket, and thickness for specific piping systems or equipment shall be as listed in insulation schedule.
- B. Provide insulation materials manufactured by Armstrong Cork Co. Certain/Teed Saint Gobain, Dow Chemical, Johns-Manville or Owens-Corning Fiberglass.
- C. Insulation, except where specified otherwise, shall have composite fire and smoke hazard ratings as rested by ASTM E-84, NFPA 255, and UL 723 procedures not exceeding:

FLAME SPREAD	25
SMOKE DEVELOPED	50
FUEL CONTRIBUTED	50

- D. Provide insulation accessories such as adhesives, mastics, cements, tape and glass fabric with same component ratings as listed above. Products or their shipping cartons shall bear label indicating their flame and smoke safety shall be permanent. Use of water soluble treatments such as corn paste or wheat paste is prohibited. This does not exclude approved lagging adhesives.
- E. Install insulation over clean dry surfaces with joints firmly butted together. Insulation at equipment, flanges, fittings, etc. shall have straight edges with box type joints with corner beads as required. Where plumbing and heating insulation terminates at equipment or unions, taper insulation at 30 degree angle to pipe with one coat finishing cement and finish same as fittings. Total insulation system shall have neat smooth appearance with no wrinkles, or folds in jackets, joint strips or fitting covers.
- F. Undamaged insulation systems on cold surface piping and equipment shall perform their intended functions as vapor barriers and thermal insulation without premature deterioration of insulation or vapor barrier. Contractor shall take every reasonable precaution to provide insulation systems with continuous unbroken vapor barriers.
- G. Abbreviations for manufacturers of adhesive, mastics and coating specified shall be C.M. for Chicago Mastic Company and B.F. for Benjamin Foster Company.
- H. Insulation failing to meet workmanship and appearance standards shall be replaced with an acceptable installation before final acceptance of project will be given. Insulation failing to meet performance requirements of this specification for a period of one year after date of final acceptance or through one heating season and one cooling season, whichever is longer shall be replaced with an acceptable installation. All costs to correct insulation deficiencies and costs to repair damages to other work shall be at Mechanical Contractors expense at no cost to owner.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS AND APPLICATION METHODS (PIPING)

A. Pipe insulation by type shall be as follows:

1. TYPE 1-PHC: Insulation for hot and cold surface piping systems with -60 degrees F to +650 degrees F operating range shall be Owens-Corning Fiberglass ASJ/SSL-11, 4.2 lb. density pipe insulation with white fire retardant ASJ jacket and double self-sealing lap. Average thermal conductivity shall not exceed .26 BTU/Hr. at 75 degrees F mean temperature. Seal longitudinal jacket laps and butt strips with C.M. No. 17-465 or B.F. No. 85-75 vapor barrier adhesive. Insulate valves and fittings as follows:
 - a. Insulate exposed and concealed valves and fittings with 2" thick glass fiberglass inserts or blankets. Cover fittings with Zeston Products PVC fitting covers or approved equal. PVC fitting covers shall be secured with mechanical fasteners such as tacks or staples for temperatures above 75 degrees F. For cold service all joints shall be sealed with vapor barrier adhesive or by pressure sensitive vapor barrier vinyl tape.

PART 3 – EXECUTION

3.1 INSULATION MATERIAL AND THICKNESS

A. Pipe insulation schedule

1. Refer to the piping insulation schedule on plans for pipe insulation material, thickness and installation requirements.

END OF SECTION 22 1500

SECTION 23 0500 - COMMON WORK RESULTS FOR HVAC

PART 1 – GENERAL PROVISIONS

1.1 CONTRACT DOCUMENTS

- A. All contract documents including drawings, alternates, addenda and modifications preceding this division of this specification are applicable to contractors, subcontractors, and material suppliers.

1.2 SPECIFICATION FORM AND DEFINITIONS

- A. These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as "the contractor shall", "shall be", "as noted on the Drawings", "according to the drawings", "a", "an", "the" and "all" are intentional. Omitted words and phrases shall be supplied by inference.
- B. The term "Engineer" wherever used in these specifications, shall mean LATIMER, SOMMERS & ASSOCIATES, P.A., 3639 SW SUMMERFIELD DRIVE, SUITE A, TOPEKA, KANSAS 66614, PHONE 785-233-3232, FAX 785-233-0647.
- C. Contractor, wherever used in these specifications, shall mean the Company that enters into contract with Owner to perform this work.
- D. When a word, such as "proper", "satisfactory", "equivalent", and "as directed", is used, it requires Engineer's review.
- E. "Provide" means furnish and install.
- F. Engineer hereinafter abbreviated "Eng" shall mean the Design Engineer.
- G. Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.
- H. When the term "equivalent" is used in context to products or manufacturer's, the equivalency of the proposed product or manufacturer to be used in lieu of the specified product or manufacturer is the sole decision of the A/E.

1.3 QUALIFICATIONS

- A. The contractor responsible for work under this section shall have completed a job of similar scope and magnitude within the last 3 years. The contractor shall employ an experienced, competent and adequate work force licensed in their specific trade and properly supervised at all times. Unlicensed workers and general laborers shall be adequately supervised to insure competent and quality work and workmanship required by this contract and all other regulations, codes and practices. At all times the contractor shall comply with all applicable local, state and federal guidelines, practices and regulations. Contractor may be required to submit a statement of qualifications upon request before any final approval and selection. Failure to be able to comply with these requirements is suitable reason for rejection of a bid.

1.4 LOCAL CONDITIONS

- A. Visit site and determine existing local conditions affecting work in contract.
- B. Failure to determine site conditions or nature of existing or new construction will not be considered a basis for granting additional compensation.

1.5 CONTRACT CHANGES

- A. Changes or deviations from Contract, including those for extra or additional work must be submitted in writing for review of Engineer. No verbal orders will be recognized.

1.6 LOCATIONS AND INTERFERENCES

- A. Location of equipment, piping and other mechanical work is indicated diagrammatically on the Drawings. Determine exact locations on job, subject to structural conditions, work of other sections of the Specifications, access requirements for installation and maintenance and approval of Engineer.
- B. Study and become familiar with the Drawings of other trades and in particular the general construction plans and details in order to obtain necessary information for figuring installation. Cooperate with work of other trades and install work in such a way as to avoid interference with work of other trades. Minor deviations, not affecting design characteristics, performance or space limitation may be permitted if reviewed by Engineer prior to installation.
- C. Any pipe, apparatus, appliance or other item interfering with proper placement of other work as indicated on Drawings, specified, or required, shall be removed and if so shown, relocated and reconnected without extra cost. Damage to new or existing work caused by Contractor shall be restored as specified for new work.
- D. Do not scale Drawings for dimensions. Accurately lay-out work from dimensions indicated on Drawings unless such is found to be in error.
- E. Report any conflict stated above to Engineer for coordination.

1.7 PERFORMANCE

- A. Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus and appliances operate satisfactorily as designed and intended. Work shall include required adjustment of systems and control equipment installed under this specification division.
 - 1. At the completion of construction, all piping systems must be cleaned and properly treated by appropriate chemical treatment contractor. Systems which are not determined acceptable to the A-E shall be re-cleaned.
 - 2. All systems, whether used for temporary construction conditioning or not, shall have a 1 year warranty from the date of substantial completion, irregardless of start-up date.
 - 3. Contractor shall make arrangements for all necessary power to operate equipment during construction and shall include in bid all costs for such use.

1.8 TEMPORARY UTILITIES

- A. Contractor shall provide temporary utilities as indicated and required.

1.9 WARRANTY

- A. All systems are to be warranted to Owner and Engineer the quality of materials, equipment, workmanship and operation of equipment provided under this specification division for a period of one year from acceptance of systems by Owner.
- B. Contractor warrants to Owner and Engineer that on receipt of notice from either of them within one year of warranty period following date of acceptance all defects that have appeared in materials and/or workmanship shall be promptly corrected to condition required by contract documents at contractor expense.

- C. The warranty above expressed shall not supersede any separately stated warranty or requirements required by law or by these specifications.

1.10 ALTERNATES

- A. Refer to General Requirements and description for alternate bid items.

PART 2 - PRODUCTS

2.1 MATERIALS, EQUIPMENT AND SUBSTITUTIONS

- A. The intent of these specifications is to allow ample opportunity for bidder to use its ingenuity and abilities to perform the work to its and the Owner's best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.
- B. Material and equipment provided shall be first class quality, new, unused and without damage unless noted otherwise.
- C. In general, these specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and specifications. The manufacturer's product, series, model, catalog and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer's products. Where other manufacturer's names are listed they are considered an approved manufacturer for the product specified, however; the listing of their names implies no prior approval of any product they may propose to furnish as equivalent to the first named product unless specific model or catalog numbers are listed in these specifications or in subsequent addenda. Where other than first named products are used for base bid proposal it shall be the responsibility of the Contractor to determine prior to bid time that the proposed materials and equipment selections are products of approved manufacturers which meet or exceed the specifications and are acceptable to the Engineer.
- D. Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to Engineer for review prior to procurement.
- E. Prior to receipt of bids, if the Contractor wishes to incorporate products other than those named in the specifications or drawings they shall submit a request for approval of equivalency in writing to the A/E no later than (10) ten calendar days prior to bid date. Engineer will review requests and acceptable items will be listed in an Addendum issued to principal bidders. Equivalents will ONLY be considered approved when listed by project addendum. Substitutions after this may be refused at Engineers option.
- F. Materials and equipment proposed for substitution shall be equal to or superior to that specified in construction, efficiency, utility, aesthetic design, and color as determined by Engineer whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access for installation and maintenance. Requests must be accompanied by two (2) copies of complete descriptive and technical data including manufacturer's name, model and catalog number, photographs or cuts, physical dimensions, operating characteristics and any other information needed for comparison. In proposing a substitution prior to receipt of bids, include in such proposal cost of altering other elements of project, including adjustments in mechanical/electrical service requirements necessary to accommodate such substitution.

- G. In proposing a substitution prior to receipt of bids, include in such bid all costs of altering other elements of the project, including such items as adjustments in mechanical/electrical service requirements necessary to accommodate such substitutions. In addition, all physical space and weight requirements requiring additional structural support, modifications to the base floor plans, equipment concrete pad/roof curb dimensions shall be incorporated as required into such bid to accommodate such substitutions.
- H. Within ten (10) working days after bids are received, apparent low bidder shall submit to A/E for approval three copies of a list of all major items of equipment he intends to provide. As soon as practicable and within ten (10) working days after award of contract, Contractor shall submit shop drawings for equipment and materials to be incorporated in work for Engineer's review. Where ten (10) working day limit is insufficient for preparation of detailed shop drawings on major equipment or assemblies, Contractor shall submit manufacturer's descriptive catalog data and indicate date such detailed shop drawings will be submitted along with manufacturer's certifications that order was placed within ten (10) working day limit.

PART 3 - EXECUTION

3.1 SHOP DRAWINGS

- A. Contractor shall furnish shop drawings of all materials and equipment. Submittals shall be submitted electronically. In addition, a minimum of (3) paper copies of any submittal that contains informational drawings or documentation that is in a format larger than 8-1/2 x 11 shall be submitted to the A/E. A/E will return the submittals to the Contractor electronically except that a copy of large format submittals will be returned to the contractor via mail. A copy of fully processed product data submittal shall be included as a part of each operating and maintenance manual.
- B. Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, fitting sizes, etc., that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these specifications or Drawing sheet number when item does not appear in specifications. Where equipment submitted does not appear in specifications or specified equivalent, mark submittals with applicable alternate numbers, change order number or letters of authorization. Each catalog sheet shall bear Equipment Manufacturer's name and address. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.
- C. Contractor shall be required to submit all applicable equipment/material assembly mock-ups as required by the Contract Documents for Engineer approval. Contractor shall provide changes and resubmit mock-ups until Engineer is satisfied final product meets or exceeds stated specifications and quality of specified product.
- D. Contractor shall check all shop drawings to verify that they meet specifications and/or drawings requirements before forwarding submittals to the Engineer for their review.
- E. All shop drawings submitted to Engineer shall bear Contractor's approval stamp which shall indicate that Contractor has reviewed submittals and that they meet specification and drawing requirements. Contractor's submittal review shall specifically check for but not be limited to the following: equipment capacities, physical size in relation to space allowed, electrical characteristics, provisions for supply, return and drainage connections to building systems. All shop drawings not meeting Contractor's approval shall be returned to its supplier for resubmittal.
- F. No shop drawing submittals will be considered for review by the Engineer without Contractor's approval stamp, or that have extensive changes made on the original submittal as a result of Contractor's review. All comments or minor notations on shop drawings shall be flagged to indicate originator of comment.

- G. Engineer will not be responsible for or the cost of returning shop drawing submittals that are submitted without Contractor's review and approval stamp. A letter will be sent to Contractor by the Engineer indicating receipt of an improper submittal for pick-up by Contractor or supplier for 15 working days after date of receipt. If not picked up by the 16th working day, submittals not bearing Contractor's review and approval stamp will be disposed of by Engineer.
- H. Engineer's review of shop drawings will not relieve Contractor of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing by Owner or its representative, nor shall it relieve Contractor of responsibility for errors in shop drawings. No work shall be fabricated until Engineer's review has been obtained with "no exceptions" or "as noted" language. Any time delay caused by correcting and resubmitting shop drawings will be Contractor's responsibility.
- I. The preparation of coordination drawings are not a requirement of the project unless otherwise indicated on the drawings. It is strongly recommended, however, that the various contractors work together to prepare detailed coordination drawings in an effort to minimize conflicts created as the various trades install their particular portion of the work. The design team will assist the contractor in resolving coordination conflicts by reviewing these coordination drawings; however, this review will not constitute any approval of said drawings. There will be no additional compensation for deviations in pipe, ductwork or conduit routing required to achieve coordination of the material and equipment scheduled or indicated to be installed as a part of the project. There will be no additional compensation for the rework of pipe ductwork or conduit should this become required as a result of a lack of coordination between the various trades.
- J. Contractor shall submit the following items for this project:
 - 1. Ductwork and ductwork accessories
 - 2. Grilles Registers and Diffusers
 - 3. Ductwork Insulation
 - 4. System Testing and Balancing

3.2 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

- A. Submit an outline copy of installation, operating, and maintenance manuals for review and comment.
- B. Submit three copies of installation, operating, maintenance instructions, and parts lists for equipment provided. After receiving comments from outline review. Instructions shall be prepared by equipment manufacturer.
- C. Keep in safe place, keys and wrenches furnished with equipment under the Contract. Present to Owner and obtain receipt for same upon completion of project.
- D. Prepare a complete notebook, covering systems and equipment provided and installed under this contract. Submit notebooks to Engineer for review before delivery to Owner. Contractor at his option may prepare this notebook or retain an individual to prepare it for him. Contractor shall include cost of this service in bid. Notebook shall contain following:
 - 1. Certified equipment drawings/or catalog data with equipment provided clearly marked as outlined under this specification.
 - 2. Complete installation, operating, maintenance instructions and parts lists for each item of equipment.
 - 3. A complete set of approved final shop drawings.
 - 4. Special emergency operating instructions with a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to various parts of the systems installed.

5. As-Built Drawings: The Contractor shall mark up a set of contract documents during construction noting all changes and deviations including change orders. These will be delivered to A/E at end of the project for review and correction as required. After the originals are changed to reflect the blue line set, a complete set of reproducible set of project record drawings drawn at the original scale indicated shall be included in the brochure.
 6. All required warranties and guarantees, including start and end date of warranties/guarantees.
- E. Provide notebooks bound in black vinyl three-ring binders. Reinforce binding edge of each sheet of loose-leaf type brochure to prevent tearing from continued usage. Clearly print on label insert of each brochure:
1. Project name and address.
 2. Section of work covered by brochure, e.g. "Heating, Ventilating and Air Conditioning", and "Plumbing", etc.
- F. In addition to the hard copy of the operating and maintenance manuals, provide a digital copy delivered to the Owner on a flash drive, CD or DVD.

3.3 CUTTING AND PATCHING

- A. Contractor shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Engineer's approval and in an approved manner.
- B. Patching shall be by mechanics of particular trade involved and shall meet approval of Engineer.
- C. Drilling and cutting of openings through building materials requires Engineer's review and approval. Make openings in concrete with concrete hole saw or concrete drill. Use of star drill or air hammer for this work is not acceptable.

3.4 MUTILATION

- A. Mutilation of building finishes or existing/new equipment caused by demolition or installation of new work shall be repaired at Contractor's expense to approval of Engineer.

3.5 WALL PENETRATIONS

- A. Include the installation of all boxes, access panels and sleeves for openings required to install the work. All floor and wall penetrations shall be sealed to meet fire rating requirements using materials tested in accordance with ASTM E814.

3.6 OPENINGS, ACCESS PANELS & SLEEVES

- A. Include the installation of all boxes, access panels and sleeves for openings required to install this work, except structural openings incorporated in the structural drawings. Sleeves shall be installed for all pipes passing through structural slabs and walls unless otherwise noted on plans. Set and verify the location of sleeves as shown on structural plans that pass through beams, only if so shown. All floor and wall penetrations be sealed to meet fire rating requirements. Access panels shall include those required to access fire dampers, valves, smoke dampers, pipe chases, manual and automatic dampers, etc. Locations and sizes of panels are to be determined by the contractor and are not specifically shown on the drawings.

3.7 FIRE STOPPING

- A. All holes or voids created by the mechanical Subcontractor to extend pipe through fire rated floors and walls shall be sealed with an intumescent material capable of expanding up to 8 to 10 times when exposed to temperatures of 250 degrees F. It shall be ICBO, BOCAI and SBCCI (NRB 243) approved ratings to 3 hours per ASTM E-814 (UL 1479). Acceptable Material: 3M Fire Barrier Caulk, putty, strip and sheet forms. Equivalent by Hilti, SpecSeal.
- B. Submit for review fire-stopping methods and sleeve drawings indicating all required application, methods and sleeves. Refer to Engineering drawing for locations of fire rated partitions and floors.
- C. Penetrations through all walls and/or floors shall be firestopped.

3.8 SETTING, ADJUSTMENT AND EQUIPMENT SUPPORTS

- A. Work shall include mounting, alignment and adjustment of systems and equipment. Set all equipment level on adequate supports and provide proper anchor bolts and isolation as shown or specified. Equipment failures resulting from improper installation or field alignment shall be repaired or replaced by Contractor at no cost to Owner.
- B. Provide each piece of equipment or apparatus suspended from ceiling or mounted above floor level with suitable structural support, platform or carrier in accordance with best recognized practice. Contractor shall arrange for attachment to building structure, unless otherwise indicated on drawings or as specified. Provide hangers with vibration eliminators where required. Contractor shall verify that structural members of building are adequate to support equipment. Submit details of hangers, platforms and supports together with total weights of mounted equipment to Engineer for review before proceeding with fabrication or installation.

3.9 START-UP, CHANGEOVER, TRAINING AND OPERATION CHECK

- A. Contractor shall be responsible for training Owner's operating personnel to operate and maintain systems and equipment installed. Keep a record of training provided to Owner's personnel listing the date, subject covered, instructor's name, names of Owner's personnel attending and total hours of instruction given each individual.
- B. All owner training sessions shall be orderly and well organized and shall be professionally videotaped using digital format. Contractor shall produce a DVD or Flash Drive of each training session which shall be submitted to Owner as part of the Operation and Maintenance Manual submittal.

3.10 PRE-FINAL AND FINAL CONSTRUCTION REVIEW

- A. At Contractor's request, Engineer will make pre-final construction review to determine if to the best of its knowledge project is completed in accordance with Contract Documents.
- B. Items found by Engineer as not complete or not in accordance with requirements of contract will be outlined in report to Engineer for forwarding to subcontractors. Subcontractor shall complete and/or correct these items, before notifying Engineer it is ready for final review.
- C. All necessary system adjustments, including air systems balancing, shall be completed and all specified records and reports submitted in sufficient time to be received by Engineer at least ten working days prior to date of final construction review.

- D. At final construction review, Contractors shall be present or shall be represented by a person of authority. Each shall demonstrate, as directed by Engineer that work complies with purpose and intent of contract documents and shall provide labor, services, instruments or tools necessary for such demonstrations and tests.

END OF SECTION 23 0500

SECTION 23 0501 - EXTENT OF CONTRACT WORK AND CODES

PART 1 - GENERAL (Reference Section 230500)

1.1 GENERAL EXTENT OF WORK INCLUDED IN CONTRACT

- A. Provide mechanical systems indicated on Drawings, specified or reasonably implied. Provide every device and accessory necessary for proper operation and completion of mechanical systems. In no case will claims for "Extra Work" be allowed for work about which Contractor could have been informed before bids were taken.
- B. Become familiar with equipment provided by other Subcontractors which require mechanical connections and controls.
- C. Electrical work required to install and control mechanical equipment which is not indicated on Drawings or specified under Division 16 shall be included.
- D. The cost and provision of larger wiring, conduit, control, and protective devices resulting from installation of equipment which was not used for basis of design as outlined in specifications shall be provided at no increase in contract price.
- E. Provide supervision to subcontractor to insure that required connections, interlocking and interconnection of mechanical and electrical equipment are made to attain intended control sequences and system operation.
- F. Furnish electrical wiring diagrams to Engineer and to Electrical Subcontractor. Diagrams shall show factory and field wiring of components and controls. Control devices and field wiring to be provided by Electrical Subcontractor shall be clearly indicated by notation and drawing symbols on wiring diagrams.
- G. Obtain complete electrical data on mechanical shop drawings and list this data on an approved form which shall be presented monthly or on request, to Electrical Subcontractor. Data shall be complete with wiring diagrams received to date and shall contain necessary data on electrical components of mechanical equipment such as HP, voltage, amperes, watts, locked rotor current to allow Electrical Subcontractor to order electrical equipment.

1.2 CODES, ORDINANCES, RULES AND REGULATIONS

- A. Provide work in accordance with applicable rules, codes, ordinances and regulations of Local, State, Federal Governments, and other authorities having lawful jurisdiction.
- B. Conform to editions and supplements of codes, standards or recommended practices as listed on the Project Code Footprint.
- C. Drawings and specifications indicate minimum construction standard, should any work indicated be sub-standard to any ordinances, laws, codes, rules or regulations bearing on work, Contractor shall promptly notify Engineer in writing before proceeding with work so that necessary changes can be made. However, if Contractor proceeds with work knowing it to be contrary to any ordinances, laws, rules, and regulations he shall thereby have assumed full responsibility for and shall bear all costs required to correct non-complying work.
- D. Contractor shall secure and pay for necessary permits and certificates of inspection required by governmental ordinances, laws, rules or regulations. Keep a written record of all permits and inspection certificates and submit two copies to Engineer with request for final review.

PART 2 - PRODUCTS

2.1 DRAWINGS

- A. Drawings are to be considered diagrammatic for all systems. Piping and drawings do not show all required offsets and fittings. Contractor shall include in bid costs to provide systems which will avoid and coordinate with all existing conditions and all other building trades and systems.

END OF SECTION 23 0501

SECTION 230553 - TESTING & BALANCING

PART 1 - GENERAL (Reference Section 230500)

1.1 GENERAL

- A. Testing and balancing of the air system is to be completed near the end of construction. The Mechanical Contractor has responsibility to cooperate with, make adjustments for, and provide any equipment necessary for the TAB agency to complete the job.
- B. Acceptable Testing and Balancing Firms:
Energy Management and Control Corporation, Topeka, Kansas
Doyle Services, Lenexa, Kansas
Allied Laboratories, Lawrence, Kansas

1.2 AIR BALANCE

- A. The Contractor shall procure the services of an independent air balance and testing agency, approved by the A/E, which specializes in the balancing and testing of heating, ventilating and air conditioning systems, to balance, adjust, and test air moving equipment and air distribution. All work by this agency shall be done under engineer employed by them. All instruments used by this agency shall be accurately calibrated and maintained in good working order. If requested the tests shall be conducted in the presence of the A/E responsible for the project and/or his representative. The testing and balancing firm shall be certified by NEBB or AABC and all work shall be performed in accordance with these organizations' published procedure manuals.
- B. Air balance and testing shall not begin until systems have been completed and are in full working order. All heating, ventilation, and air conditioning systems and equipment shall be in full operation during each working day of testing and balancing.
- C. The Mechanical Contractor shall make changes in dampers, etc., as required by the test and balance agency, at no additional cost to the Owner.
- D. The balancing agency shall prepare a certified report of all tests performed. The report shall be written on standard forms prepared by NEBB or AABC or facsimiles thereof. The balancing agency shall submit 3 copies of this report to the Mechanical Contractor who shall submit them to the A/E for review and distribution.

END OF SECTION 230553

SECTION 230701 - DUCTWORK INSULATION

PART 1 – GENERAL (Reference Section 230500)

PART 2 – PRODUCTS

2.1 DUCTWORK INSULATION

- A. Provide necessary materials and accessories for installation of interior and exterior ductwork insulation as specified and/or detailed on drawings. Insulation type and thickness for specific ductwork systems shall be as listed in insulation schedule in this section of specification. Provide insulation materials manufactured by Schuller, Knauf Fiberglass, Certain/Teed, or Owens-Corning Fiberglas.
- B. Insulation and application adhesives, except where specified otherwise, shall have fire and smoke hazard rating as tested by ASTM E-84 procedure not exceeding:

FLAME SPREAD	25
SMOKE DEVELOPED	50
FUEL CONTRIBUTED	50

- C. Insulation shall meet ASTM C411 performance test and shall be installed in conformance with NFPA Standard 90A.
- D. Install interior duct liner insulation cut to insure tight fitting corner, and longitudinal joints. Apply liner to sheet metal with 100% coverage of adhesive applied in accordance with manufacturers recommended applications rate. Coat all edges of liner with adhesive. Provide mechanical fasteners on surfaces 18" or wider in addition to liner adhesive with fastener clips set flush with duct liner surface. Provide fasteners as follows:
 - 1. Low Velocity Ductwork (Velocities less than 2000 FPM): Provide fasteners within 3" of leading edge of each section 12" O.C. around joint perimeter and 3" from longitudinal joints 12" O.C. Elsewhere space fasteners 18" O.C. except not more than 6" from longitudinal joints and not 12" from corner break.
- E. Provide round sheet metal ductwork with exterior thermal insulation of type and thickness listed in insulation schedule. Apply insulation with joints tightly butted together with longitudinal and end joint strips sealed with vapor barrier adhesive. Insulate fittings with insulation thickness equal to adjoining insulation with cover overlapping 2" onto adjacent covering.
- F. Duct insulation materials by type shall be as follows:
 - 1. Type 1-DIL: Internal acoustical and thermal duct insulation for low and high velocity ductwork shall be 2 lb. density for 1/2" thick and 1.5 lb. density for 1" thick duct liner with 1.08 @ 1000 FPM friction coefficient and .24 BTUH thermal conductivity at 75 degrees mean temperature.
 - 2. Type 2-DEW: External thermal insulation for low, medium and high pressure duct shall be 1.0 lb. density standard duct insulation type IV with foil-scrim-craft facing and .27 BTUH thermal conductivity at 75 degrees mean temperature.
 - 3. Type 3-DEW: External thermal insulation for low pressure ductwork. Fiberglass with .23 Btuh thermal conductivity at 75°F mean temperature and fire retardant polyethylene .003" thick jacket. Insulation shall be premanufactured sleeve type for installation over round low velocity ductwork.

2.2 INSULATION SCHEDULE

- A. Specific insulation materials and installation methods for ductwork systems shall be as follows:

<u>DUCTWORK SYSTEM</u>	<u>TYPE</u>	<u>DUCT INSULATION THICKNESS</u>
Rectangular Low Pressure Supply and Exhaust	1-DIW	1/2"
Relief, Return and Transfer Air Boots	1-DIL	1/2"
Low Pressure Round Ductwork (<12")	3-DEW or 2-DEW	1-1/2"
Low Pressure Round (>12")	2-DEW	1-1/2"

END OF SECTION 230701

SECTION 233113 - DUCTWORK

PART 1 - GENERAL REQUIREMENTS (Reference Section 230500)

1.1 GENERAL

- A. Construct ductwork as detailed on drawings and as detailed in the latest edition of the Sheet Metal and Air Conditioning Contractor's Association (SMACNA) Duct Manual. Details shown on project plans shall indicate specific construction methods to be used on this project, and shall be used in lieu of any alternate methods shown in SMACNA Duct Manual.
- B. Construct and install ductwork to be completely free from vibration under all conditions of operation. Support and securely anchor ductwork and equipment from structural framing of building. Provide suitable intermediate metal framing where required between building structural framing.
- C. Construct ductwork in accordance with operating static pressure range. Ductwork pressure classifications shall be as follows:
 - 1. Low Pressure Ductwork: System operating static pressure 1.5" positive or negative of W.G. or less and velocities less than 2500 FPM.
- D. All metal ductwork scheduled for interior thermal and acoustical liner is not sized on plans to include the proper thickness of insulation. Add 1" or 2" in height and width of ductwork as required to accommodate insulation thickness. Mount specialties such as turning vanes, dampers, etc., to ductwork with that section insulated "Build Outs" to maintain continuity of thermal barrier.
- E. Construct low pressure system ductwork to conform to latest edition of low pressure duct construction standards of SMACNA Duct Manual.
- F. Provide spiral wound duct on all round ductwork.
- G. Sealing of low ductwork shall be as follows:
 - 1. Option #1: Seal all supply, return and exhaust duct. Provide Hard Cast, Inc. "Duct Seal 321" fiber reinforced water-based duct sealant in accordance with manufacturers' directions on all joints, connectors, etc.
 - 2. Option #2: Seal all supply, return and exhaust duct. Provide "Ductmate" systems as manufactured by Ductmate Industries, Inc. or an approved equal system.

PART 2 – PRODUCTS

2.1 RECTANGULAR STEEL

- A. Provide new commercial quality, bright spangled galvanized sheet steel manufactured in the U.S.A.

2.2 INSTALLATION

- A. All ductwork shall be installed in strict accordance with latest edition of SMACNA "HVAC Duct Construction Standards".

END OF SECTION 233113

SECTION 233300 - DUCTWORK ACCESSORIES

PART 1 – GENERAL (Reference Section 230500)

PART 2 – PRODUCTS

2.1 SHEET METAL SPECIALTIES

- A. Specialties shall be factory fabricated items designed for low, medium or high velocity systems as required. Submit shop drawings on all specialties required with shop drawings of ductwork layout. Specialties shall be as follows:

1. Turning Vanes: High Pressure Aero/Dyne or equal 26-gauge H-E-P high efficiency profile air foil vanes mounted 2-1/8" on center on 24-gauge runners. Air turns by Barber-Coleman will be acceptable on low pressure only. Note: Turning vanes to be provided on all supply, return and exhaust ducts.
2. Dampers: Provide 24-gauge minimum galvanized metal blades supported on duct with metal supports and locked in position with locking type damper arm by Carnes, Greenheck, Air Balance, Louvers & Dampers, FAP, Pottorff and Cesco
3. Flexible Connections: Metaledge Ventglas prefabricated flexible connection of 3-1/4" wide heat and fire-resistant neoprene coated glass fabric with two 3" wide 24-gauge metal strips attached to each edge. Vent Fabrics, Inc., Duro-dyne Corp. or equal.
4. Round take-off fittings: Round take-off fittings from supply diffusers or registers to low pressure supply ductwork shall be Flexmaster #FLDE complete with locking damper and air scoop. Equivalent by Atco, Air Control Products.
5. Low Pressure Flexible Duct: Thermaflex GK-M rated for +6" W.G. max. and -1" W.G. max. for duct sizes 4" to 14", +6" W.G. max. and -0.5" W.G. max for duct sizes 14" to 16", +4" W.G. max. and -0.5" W.G. max for duct sizes 18" to 20". Rated for 3500 FPM maximum velocity. UL listed "UL-181 Standards Class I Duct Material" complying with NFPA Standards 90A and 90B. Duct shall be composed of an acoustically rated inner polymeric liner duct bonded to coated steel wire helix. Fiberglass insulation and tear resistant metalized polyester film outer vapor barrier. Equivalent by Wiremold, Cleavaflex, Flexmaster.

2.2 INSTALLATION

- A. All ductwork accessories shall be installed in strict accordance with the manufacturer's requirements SMACNA, NFPA 90A and 90B, UL listings and drawing details.

END OF SECTION 233300

SECTION 233713 - GRILLES, REGISTERS AND DIFFUSERS

PART 1 - GENERAL REQUIREMENTS (Reference Section 230500)

Provide where shown on plans grilles, registers, and diffusers. Refer to schedule on plans.

PART 2 – PRODUCTS

2.1 GRILLES, REGISTERS AND DIFFUSERS

- A. Provide grilles, registers and diffusers as shown on the drawings and hereinafter specified. Set all units with rubber gaskets for air tight connection with mounting surface, see drawings for types, sizes, air flow and quantity.
- B. Install all registers with curve of louver away from line of sight. Unless noted otherwise, provide duct mounted diffusers and registers with standard margins. Finish shall be off white when mounted in ceiling, prime coat when mounted on wall finish.
- C. Provide proper mounting supplies and arrangements for areas shown. Check Architectural drawings for ceiling and all construction.
- D. Equivalent by Titus, E.H. Price, Louvers and Dampers, Greenheck and RUSKIN.

2.2 INSTALLATION

- A. Grilles, registers and diffusers shall be installed in accordance with SMACNA requirements, where balancing dampers are not provided in duct work preceding diffusers, provide opposed blade balancing damper in neck of diffuser.

END OF SECTION 233713

SECTION 26 0500 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 CONTRACT DOCUMENTS

- A. All contract documents including drawings, alternates, addenda and modifications preceding this division of this specification are applicable to contractors, subcontractors, and material suppliers.

1.2 SPECIFICATION FORM AND DEFINITION

- A. These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "shall be", "as noted on the drawings", "according to the drawings", "a", "an", "the" and "all" are intentional. Omitted words and phrases shall be supplied by inference.
- B. Engineer, wherever used in these specifications shall mean LATIMER, SOMMERS & ASSOCIATES, P.A., 3639 SW SUMMERFIELD DRIVE, SUITE A, TOPEKA, KANSAS 66614, 785-233-3232, FAX 785-233-0647.
- C. Contractor, wherever used in these specifications, shall mean the Company that enters into contract with Owner to perform this work.
- D. When a word, such as "proper", "satisfactory" and "as directed" is used, it required Engineer's review.
- E. "Provide" means furnish and install.
- F. Engineer hereinafter abbreviated ENGINEER shall mean both the Design Engineers and the Design Engineers.
- G. Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.
- H. When the term "equivalent" is used in context to products or manufacturer's, the equivalency of the proposed product or manufacturer to be used in lieu of the specified product or manufacturer is the sole decision of the ENGINEER.

1.3 QUALIFICATIONS

- A. The contractor responsible for work under this section shall have completed a job of similar scope and magnitude within the last 3 years. The contractor shall employ an experienced, competent and adequate work force licensed in their specific trade and properly supervised at all times. Unlicensed workers and general laborers shall be adequately supervised to insure competent and quality work and workmanship required by this contract and all other regulations, codes and practices. At all times the contractor shall comply with all applicable local, state and federal guidelines, practices and regulations. Contractor may be required to submit a statement of qualifications upon request before any final approval and selection. Failure to be able to comply with these requirements is suitable reason for rejection of a bid.

1.4 LOCAL CONDITIONS

- A. Visit site and determine existing local conditions affecting work in contract.

- B. Failure to determine site conditions or nature of existing or new construction will not be considered basis for granting additional compensation.

1.5 CONTRACT CHANGES

- A. Changes or deviations from contract, including those for extra or additional work must be submitted in writing for review of Engineer. No verbal orders will be recognized.

1.6 LOCATIONS AND INTERFERENCES

- A. Locations of equipment, conduit and other electrical work are indicated diagrammatically by electrical drawings. Layout work from dimensions on Architectural and Structural Drawings. Verify equipment size from manufacturers shop drawings.
- B. Study and become familiar with contract drawings of trades and in particular general construction drawings and details in order to obtain necessary information for figuring installation. Cooperate with other workmen and install work in such a way to avoid interference with their Work. Minor deviations, not affecting design characteristics, performance or space limitation may be permitted if reviewed prior to installation by Engineer.
- C. Should the requirements of work or systems installed by other trades require specific placement of conduit, apparatus, appliances or other electrical item, these requirements shall be adhered to. Should these requirements result in major deviations in placement from that indicated on the plans or specifications, the condition shall be reviewed by ENGINEER prior to the placement of the work.
- D. Any conduit, apparatus, appliance or other electrical item interfering with proper placement of other work as indicated on drawings, specified, or required, shall be removed and if so shown relocated and reconnected without extra cost. Damage to other Work caused by this contractor, subcontractor, workers or any cause whatsoever, shall be restored as specified for new work.
- E. Do not scale electrical drawings for dimensions. Accurately layout work from dimensions indicated on Architectural drawings unless such be found in error.
- F. Report any conflict stated above to supervisor for coordination.

1.7 PERFORMANCE

- A. Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus and appliances operate satisfactorily as designed and intended. Work shall include required adjustment of systems and control equipment installed under this specification division.

1.8 TEMPORARY UTILITIES

- A. Contractor shall provide temporary utilities as indicated in Section 015000 during construction.

1.9 WARRANTY

- A. The electrical systems are to be warranted to Owner and Engineer the quality of materials, equipment, workmanship and operation of equipment provided under this specification division for a period of one year from acceptance of electrical systems by Owner.
- B. Contractor warrants to Owner and Engineer that on receipt of notice from either of them within one year of warranty period following date of acceptance all defects that have appeared in materials and/or workmanship, shall be promptly corrected to condition required by contract documents at contractor expense.

- C. The warranty above expressed shall not supersede any separately stated warranty or requirements required by law or by these specifications.

1.10 ALTERNATES

- A. Refer to General Requirements and description for alternate bid items if applicable.

PART 2 – PRODUCTS

2.1 MATERIALS, EQUIPMENT AND SUBSTITUTIONS

- A. The intent of these specifications is to allow ample opportunity for Contractor to use ingenuity and ability to perform the work to his and Owner's best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.
- B. Material and equipment installed under this contract shall be first class quality, new, unused and without damage unless noted otherwise on plans.
- C. In general, these specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and specifications. The manufacturer's product, series, model, catalog and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer's products. Where other manufacturer's names are listed they are considered an approved manufacturer for the product specified, however; the listing of their names implies no prior approval of any product they may propose to furnish as equivalent to the first named product unless specific model or catalog numbers are listed in these specifications or in subsequent addenda. Where other than first named products are used for base bid proposal it shall be the responsibility of the Contractor to determine prior to bid time that the proposed materials and equipment selections are products of approved manufacturers which meet or exceed the specifications and are acceptable to the Engineer.
- D. Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to Engineer for review prior to procurement.
- E. Prior to receipt of bids, if the Contractor wishes to incorporate products other than those named in the specifications or drawings they shall submit a request for approval of equivalency in writing to the ENGINEER no later than (10) ten calendar days prior to bid date. Engineer will review requests and acceptable items will be listed in an Addendum issued to principal bidders. Equivalents will ONLY be considered approved when listed by project addendum. Substitutions after this may be refused at Engineers option.
- F. Materials and equipment proposed for substitution shall be equal to or superior to that specified in construction, efficiency, utility, aesthetic design, and color as determined by Engineer whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access for installation and maintenance. Requests must be accompanied by two (2) copies of complete descriptive and technical data including manufacturer's name, model and catalog number, photographs or cuts, physical dimensions, operating characteristics and any other information needed for comparison.
- G. In proposing a substitution prior to receipt of bids, include in such bid all costs of altering other elements of the project, including such items as adjustments in mechanical/electrical service requirements necessary to accommodate such substitutions. In addition, all physical space and weight requirements requiring additional structural support, modifications to the base floor plans, equipment concrete pad/roof curb dimensions shall be incorporated as required into such bid to accommodate such substitutions.

- H. Within ten (10) working days after bids are received, apparent low bidder shall submit to ENGINEER for approval three copies of a list of all major items of equipment he intends to provide. As soon as practicable and within ten (10) working days after award of contract, Contractor shall submit shop drawings for equipment and materials to be incorporated in work for Engineer's review. Where ten (10) working day limit is insufficient for preparation of detailed shop drawings on major equipment or assemblies, Contractor shall submit manufacturer's descriptive catalog data and indicate date such detailed shop drawings will be submitted along with manufacturer's certifications that order was placed within ten (10) working day limit.

PART 3 – EXECUTION

3.1 SHOP DRAWINGS

- A. Contractor shall furnish shop drawings of all materials and equipment. Submittals shall be submitted electronically. In addition, a minimum of (3) paper copies of any submittal that contains informational drawings or documentation that is in a format larger than 8-1/2 x 11 shall be submitted to the A/E. A/E will return the submittals to the Contractor electronically except that a copy of large format submittals will be returned to the contractor via mail. A copy of fully processed product data submittal shall be included as a part of each operating and maintenance manual.
- B. Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, sizes, etc., that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these specifications, or plan sheet number when item does not appear in specifications or specified equivalent, mark submittals with applicable alternate numbers, change order number or letters of authorization. Each catalog sheet shall bear equipment manufacturer's name, address and phone number. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.
- C. Contractor shall be required to submit all applicable equipment/material assembly mock-ups as required by the Contract Documents for Engineer approval. Contractor shall provide changes and resubmit mock-ups until Engineer is satisfied final product meets or exceeds stated specifications and quality of specified product.
- D. Contractor shall check all shop drawings to verify that they meet specifications and/or drawing requirements before forwarding submittals to the Engineer for their review.
- E. All shop drawings submitted to Engineer shall bear Contractor's approval stamp which shall indicate that Contractor has reviewed submittals and that they meet specification and drawing requirements. Contractor's submittal review shall specifically check for but not be limited to the following: equipment capacities, physical size in relation to space allowed, electrical characteristics, provisions for supply, and drainage connections to building systems. All shop drawings not meeting contractor's approval shall be returned to it's supplier for resubmittal.
- F. No shop drawing submittals will be considered for review by the Engineer without Contractor's approval stamp, or that have extensive changes made on the original submittal as a result of contractor's review. All comments or minor notations on shop drawings shall be flagged to indicate originator of comment.
- G. Engineer will not be responsible for or the cost of returning shop drawing submittals that are submitted to them without Contractor's review and approval stamp. A letter will be sent to Contractor by either the Engineer or Engineer indicating receipt of an improper submittal for pick-up by Contractor or supplier for 15 working days after date of receipt. If not picked up by the 16th working day, submittals not bearing Contractor's review and approval stamp will be disposed of by Engineer.

- H. Engineer's review of shop drawings will not relieve Contractor of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing by Owner or the representative, nor shall it relieve Contractor of responsibility for error in shop drawings. No work shall be fabricated until ENGINEER's review has been obtained. Any time delay caused by correcting and resubmitting shop drawings will be Contractor's responsibility.
- I. The preparation of coordination drawings are not a requirement of the project unless otherwise indicated on the drawings. It is strongly recommended, however, that the various contractors work together to prepare detailed coordination drawings in an effort to minimize conflicts created as the various trades install their particular portion of the work. The design team will assist the contractor in resolving coordination conflicts by reviewing these coordination drawings; however, this review will not constitute any approval of said drawings. There will be no additional compensation for deviations in pipe, ductwork or conduit routing required to achieve coordination of the material and equipment scheduled or indicated to be installed as a part of the project. There will be no additional compensation for the rework of pipe ductwork or conduit should this become required as a result of a lack of coordination between the various trades.
- J. Contractor shall submit the following items for this project:
 - 1. All conduit, raceways and cable trays
 - 2. All conductors
 - 3. All junction boxes, backboxes and conduit bodies
 - 4. All wiring devices
 - 5. All circuit breaker panelboards.
 - 6. All circuit breakers
 - 7. All disconnect switches
 - 8. All motor starters and motor controllers.
 - 9. All lighting fixtures and luminaires

3.2 OPERATING AND MAINTENANCE INSTRUCTION MANUALS

- A. Submit an outline copy of installation, operating, and maintenance manuals for review and comment.
- B. Submit three copies of installation, operating, maintenance instructions, and parts lists for equipment provided. After receiving comments from outline review. Instructions shall be prepared by equipment manufacturer.
- C. Keep in safe place, keys and wrenches furnished with equipment under this contract. Present to Owner and obtain receipt for same upon completion of project.
- D. Prepare a complete notebook, covering systems and equipment provided and installed under this contract. Submit notebooks to Engineer for review before delivery to Owner. Contractor at his option may prepare this notebook or retain an individual to prepare it for him. Contractor shall include cost of this service in bid. Notebooks shall contain following:
 - 1. Certified equipment drawings/or catalog data with equipment provided clearly marked as outlined under this specification.
 - 2. Complete installation, operating, maintenance instructions and parts lists for each item of equipment.
 - 3. A complete set of approved final shop drawings.
 - 4. Special emergency operating instructions with a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to various parts of the systems installed.

5. As-Built Drawings: The Contractor shall mark up a set of contract documents during construction noting all changes and deviations including change orders. These will be delivered to ENGINEER at end of the project for review and correction as required. After the originals are changed to reflect the blue line set, a complete set of reproducible set of project record drawings drawn at the original scale indicated shall be included in the brochure.
 6. All required warranties and guarantees, including start and end date of warranties/guarantees.
- E. Provide notebooks bound in black vinyl three- ring binders with metal hinge. Reinforce binding edge of each sheet of loose-leaf type brochure to prevent tearing from continued usage. Clearly print on label insert of each brochure:
1. Project name and address.
 2. Section of work covered by brochure, i.e., Electrical.
- F. In addition to the hard copy of the operating and maintenance manuals, provide a digital copy delivered to the Owner on a flash drive, CD or DVD.

3.3 CUTTING AND PATCHING

- A. Contractor shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Engineer's approval and in a manner approved by him.
- B. Patching shall be by mechanics of particular trade involved and shall meet approval of Engineer.
- C. Drilling and cutting of openings through building materials requires Engineer's review and approval. Make openings in concrete with concrete hole saw or concrete drill. Use of star drill or air hammer for this work will not be permitted.

3.4 MUTILATION

- A. Mutilation of building finishes or existing/new equipment caused by demolition or installation of new work shall be repaired at Contractor's expense to approval of Engineer.

3.5 WALL PENETRATIONS

- A. Include the installation of all boxes, access panels and sleeves for openings required to install the work. All floor and wall penetrations shall be sealed to meet fire rating requirements using materials tested in accordance with ASTM E814. Assume all walls are fire rated.

3.6 OPENINGS, ACCESS PANELS AND SLEEVES

- A. Contractor shall provide all boxes, access panels and sleeves for openings required to install his work, except structural openings incorporated in the structural drawings. Sleeves shall be installed for all pipes passing through structural slabs and walls.

3.7 FIRE STOPPING

- A. All holes or voids created by the electrical contractor to extend pipe through fire rated floors and walls and shall be sealed with an intumescent material capable of expanding up to 8 to 10 times when exposed to temperatures of 250 degrees F. It shall be ICBO, BOCAI and SBCCI (NRB 243) approved ratings to 3 hours per ASTM E-814 (UL 1479). Acceptable Material: 3M or Hilti Fire Barrier Caulk, putty, strip and sheet forms. Equivalent by SpecSeal.

- B. Submit for review firestopping methods and sleeve drawings indicating all required application, methods and sleeves. Refer to engineering drawing for locations of fire rated partitions and floors.
- C. All penetrations through walls shall be firestopped.

3.8 SETTING, ADJUSTMENT AND EQUIPMENT SUPPORTS

- A. Work shall include mounting, alignment and adjustment of systems and equipment. Set all equipment level on adequate supports and provide proper anchor bolts and isolation as shown or specified. Equipment failures resulting from improper installation or field alignment shall be repaired or replaced by Contractor at no cost to Owner.
- B. Provide each piece of equipment or apparatus suspended from ceiling or mounted above floor level with suitable structural support, platform or carrier in accordance with best recognized practice. Contractor shall arrange for attachment to building structure, unless otherwise indicated on drawings or as specified. Provide hangers with vibration eliminators where required. Contractor shall verify that structural members of building are adequate to support equipment. Submit details of hangers, platforms and supports together with total weights of mounted equipment to Engineer for review before proceeding with fabrication or installation.

3.9 START-UP, CHANGEOVER, TRAINING AND OPERATION CHECK

- A. Contractor shall be responsible for training Owner's operating personnel to operate and maintain systems and equipment installed. Keep a record of training provided to Owner's personnel listing the date, subject covered, instructor's name, names of Owner's personnel attending, and total hours of instruction given each individual.
- B. All owner training sessions shall be orderly and well organized and shall be professionally recorded using digital format. Contractor shall produce a DVD or copy on a flash drive of each training session and submit to Owner as part of the Operation and Maintenance Manual submittal.

3.10 PRE-FINAL AND FINAL CONSTRUCTION REVIEW

- A. At Contractor's request, Engineer will make pre-final construction review to determine if to the best of its knowledge project is completed in accordance with Contract Documents.
- B. Items found by Engineer as not complete or not in accordance with requirements of contract will be outlined in report to Engineer for forwarding to Subcontractors. Subcontractor shall complete and/or correct these items, before notifying Engineer it is ready for final review.
- C. All necessary system adjustments, including air systems balancing, shall be completed and all specified records and reports submitted in sufficient time to be received by Engineer at least ten working days prior to date of final construction review.
- D. At final construction review, Contractors shall be present or shall be represented by a person of authority. Each shall demonstrate, as directed by Engineer that work complies with purpose and intent of contract documents and shall provide labor, services, instruments or tools necessary for such demonstrations and tests.

3.11 TESTS RECORDING AND REPORTING TESTS AND DATA

- A. Record nameplate horsepower, amperes, volts, phase service factor and other necessary data on motors and other electrical equipment furnished and/or connected under this contract.

- B. Record motor starter catalog number, size and rating and/or catalog number of thermal-overload units installed in all motor starters furnished and/or connected under this contract. See motor starter specification for instructions for proper sizing of thermal-overload units.
- C. Record amperes-per0phase at normal or near-normal loading of each item of equipment furnished and/or connected.
- D. Record correct readings of each feeder conductor after energized and normally loaded, and again after balancing of feeder loads as required by current readings.
- E. Record voltage and ampere-per-phase readings taken at service entrance equipment after completion of project with building operating at normal electrical load.
- F. Submit at least two (2) typewritten copies of data noted above to Engineer for review prior to final inspection.
- G. Keep a record of all deviations made from routes, locations, circuiting, etc. shown on contract drawings. Prior to final inspection submit one new set of project drawings with all deviations and changes clearly indicated.

END OF SECTION 26 0500

SECTION 26 0501 - EXTENT OF CONTRACT WORK AND CODES

PART 1 - GENERAL (Reference Section 260500)

1.1 GENERAL EXTENT OF WORK INCLUDED IN CONTRACT

- A. Provide electrical systems indicated on drawings, specified or reasonably implied. Provide every device and accessory necessary for proper operation and completion of electrical systems. In no case will claims for "Extra Work" be allowed for work about which Contractor could have been informed before bids were taken.
- B. Contractor shall be familiar with all equipment provided which requires electrical connections and control. Follow circuiting shown on drawings for lighting, power and equipment connections.
- C. Make required electrical connections to equipment provided under this project. Receive and install electric control devices requiring field installation, wiring, and service connection.
- D. Check electrical data and wiring diagrams with project voltages, wiring, controls and protective devices shown on electrical drawings. Promptly bring discrepancies found to attention of Engineer for a decision.

1.2 CODES, ORDINANCES, RULES AND REGULATIONS

- A. Provide work in accordance with applicable rules, codes, ordinances and regulations of Local, State, Federal Governments, and other authorities having lawful jurisdiction.
- B. Conform to editions and supplements of codes, standards or recommended practices as indicated on Project Code plan.
- C. Drawings and specifications indicate minimum construction standard, should any work indicated be sub-standard to any ordinances, laws, codes, rules or regulations bearing on work, Contractor shall promptly notify Engineer in writing before proceeding with work so that necessary changes can be made. However, if Contractor proceeds with work knowing it to be contrary to any ordinances, laws, rules, and regulations he shall thereby have assumed full responsibility for and shall bear all costs required to correct non-complying work.
- D. Contractor shall secure and pay for necessary permits and certificates of inspection required by governmental ordinances, laws, rules or regulations. Keep a written record of all permits and inspection certificates and submit two copies to Engineer with request for final review.
- E. Contractor shall include in bid any charges by local utility providers to establish new services to the structure. Coordinate with the utility suppliers to verify exact which part of the work is to be performed by whom.

PART 2 - PRODUCTS

2.1 DRAWINGS

- A. Drawings are to be considered diagrammatic for all systems. Conduit runs and circuiting do not show all required offsets and fittings. Contractor shall include in bid costs to provide systems which will avoid and coordinate with all other building trades and systems.
- B. Contractor may not share neutrals for multiple circuits, unless specifically noted as such on the drawings.

- C. Homeruns for single phase circuits may be grouped together, however, no more than (3) single phase circuits shall be installed in a common conduit. Contractor shall be responsible for properly sizing conduits where homeruns are grouped together per requirements of the National Electric Code.

END OF SECTION 260501

SECTION 26 1100 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL (Reference Section 260500)

PART 2 - PRODUCTS

2.1 STEEL CONDUIT

- A. EMT Conduit: Conduit shall be galvanized steel electrical metallic tubing and bear and Underwriters' Laboratory label. Conduit shall conform to Federal Specification WWC-563 and ANSI specification C80.3.
- C. Contractor shall use EMT for all above grade main feeder circuits to panelboards unless specifically indicated on plans.
- D. Outside and Wet Location Flexible Conduit: Flexible conduit shall have a water resistant non-sleeving polyvinyl chloride jacket with a general temperature range of -40 degrees C to + 60 degrees C. Conduit shall bear a UL label.
- E. MC Flexible Conduit: 3/8" may only be used from JB to lighting fixture as per NEC 330. A ground wire shall be run in the conduit assembly.
- F. Liquid tight flexible metal conduit Type LFMC: Liquid tight flexible metal conduit shall be used for final connection to interior and exterior motors or equipment where vibration may be encountered. A maximum length of 6'-0" shall be used. A grounding conductor shall be installed in all conduits to include liquid tight flexible metal conduit. Transition from EMT conduit to liquid tight flexible metal conduit shall be made by use of a NEMA 3R junction box. Liquid tight flexible metal conduit shall be installed as indicated in NEC Article 350.

2.2 CONDUIT FITTINGS

- A. EMT Conduit: Couplings and box connectors shall be diecast set screw type. Unilets shall be malleable iron with blank cover.
- C. Flexible Conduit: Connectors shall be threaded type iron with insulated throat.
- D. Where conduits cross building expansion joints provide O-Z expansion fittings type "AX", "TE", "EX", or "EXE" as required.
- E. Provide grounding bushings where feeder conduit attaches to panelboard backbox. Bond grounding bushing to ground bus.

2.3 CONDUIT INSTALLATION

- A. Align conduit terminations at panelboards, switchboards, motor control equipment, junction boxes, etc. and install true and plumb. Provide supports or templates to hold conduit alignment during rough-in stage of work.
- B. Install conduit continuous between outlet boxes, cabinets and equipment. Make bends smooth and even without flattening or flaking conduit. Radius of bends shall not be shorter than radius listed table 346-10 (b) of NEC. Long radius elbows may be used where necessary.
- C. Ream and clean conduit before installation and plug or cover openings and boxes to keep conduit clean during construction.

- D. Install no conduits or other raceways sized smaller than permitted in applicable NEC Tables. Where conduit sizes shown on drawings are smaller than permitted by code, Contractor shall include cost for proper size conduit in his base bid. In no case reduce conduit sizes indicated on drawings or specified without written approval of Engineer. Fasten conduit securely in place with approved straps, hangers, and steel supports. Provide O-Z cable support to support conductors in vertical raceways as required by NEC Table 300-19 (a) of NEC.
- E. Low voltage wiring including fire alarm, telephone, television, computer cabling and other low voltage wiring shall be installed in conduit unless noted otherwise.

2.4 INSERTS, HANGERS

- A. Support vertical and horizontal conduit runs at intervals not greater than 10 feet, within 3 feet of any bend and at every outlet or junction box
- B. Install multiple runs of conduits as follows:
 - 1. Where a number of conduits are to be run exposed and parallel, group and support with trapeze hangers.
 - 2. Fasten hanger rods to structural steel members with suitable beam clamps and to concrete structures with inserts set flush with surface. Install concrete inserts with reinforced rod through opening provided in inserts.
 - 3. Inserts shall be Grinnell figure 279, 281, 282, or 285 or equivalent as required by load and concrete thickness.
 - 4. Provide beam clamps suitable for structural members and conditions.
 - 5. Provide 3/8" minimum diameter steel hangers rods galvanized or cadmium plated finish.
 - 6. Trapeze hangers shall be Kindorf Series 900 channel with fittings and accessories as required.
 - 7. Attach each conduit to trapeze hanger with Steel City No. C-105 clamps for rigid conduit and Steel City No. C-106 clamps for electrical metallic tubing. (EMT).
- C. Install clamps for single conduit runs as follows:
 - 1. Support individual runs by approved pipe straps, secured by toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. Use of perforated strap not permitted.
 - 2. Install exposed conduits in damp locations with clamp backs under each conduit clamp to prevent accumulation of moisture around conduits.
 - 3. Provide inserts, hangers and accessories with finish as follows:
 - a. Galvanized: Concrete inserts and pipe straps.
 - b. Galvanized or Cadmium Plated: Steel bolts, nuts, washers and screws.
 - c. Painted with Prime Coat: Individual hangers, trapeze hangers and rods.
- D. Equivalent hangers and support systems by Binkley, Fee and Mason, Kin-Line or Unistrut.

2.5 BUSHINGS AND LOCKNUTS

- A. Enter outlet boxes squarely and securely clamp conduit to outlet box with bushing on inside and locknut on outside.

2.6 SLEEVES

- A. Provide proper type and size sleeves to General Contractor for electrical ducts, busses, conduits, etc. passing through building construction. Supervise installation to insure proper sleeve location. Unless indicated or approved install no sleeves in structural members.
- B. Provide cast iron sleeves extending 1 inch above finished floor where sleeves pass through floors subject to flooding such as toilet rooms, bathrooms, equipment rooms and kitchen. Seal opening between pipe and sleeve with Thunderline Corp. Link Seal.
- C. Unless specified otherwise provide 18 gauge galvanized sheet metal sleeves through floors and non-bearing walls. Where piping passes through exterior walls, equipment room walls, air plenum walls and walls between areas that must be isolated from occupied areas, seal space between sleeves and piping, air or water tight are required with Thunderline Corp. Link Seal.
- D. Provide O-Z Electrical Manufacturing Co., Inc. Type "FSK" or "WSK" or equivalent thruwall and floor seals where conduits pass through concrete foundation walls below grade.
- E. Provide Zurn Z-195 or equivalent flashing sleeve through walls and floors with waterproof membrane. Seal annular space between conduit and sleeve with Thunderline Link Seal or O-Z type CSM sealing bushing.
- F. All holes or voids created by the electrical contractor to extend pipe through fire rated floors and walls shall be sealed with an intumescent material capable of expanding up to 8 to 10 times when exposed to temperatures of 250 degrees F. It shall have ICBO, BOCAI and SBCCI (NRB 243) approved ratings to 3 hours per ASTM E-814 (UL 1479). Acceptable Material: 3M Fire Barrier Caulk, Putty, Strip and sheet forms.

2.7 OUTLET BOXES

- A. Provide electrical service outlets, including plug receptacles, lamp receptacles, lighting fixtures and switches with Steel City, Raco, or equivalent four inch code gauge steel knockout boxes galvanized or sheradized of required depth for service or device.
- B. Provide code gauge galvanized steel raised covers on outlet boxes installed in plaster finish. Set to plaster grounds with outside edge of cover flush with plaster finish.
- C. Provide 3/8" or larger fixture stud in each outlet box scheduled to receive lighting fixture. Select covers with proper opening for device installed in outlet box.
- D. Use of utility of "Handy" boxes acceptable only where single gang flush outlet box in masonry is "dead-end" with only one conduit entering box from end or back.
- E. Use no sectional outlet boxes.
- F. Provide Appleton FS or FD unilets for surface mounted exterior work. Provide complete with proper device cover and gasket. Provide blank cover and gasket when used as junction box.

2.8 LOCATION OF OUTLET BOXES

- A. Locate outlet boxes generally from column centers and finished wall lines. Install ceiling outlet boxes at suspended ceiling elevations.
- B. Accurately locate lighting fixtures and appliance outlet boxes mounted in concrete or in plaster finish on concrete. Install outlet boxes in forms to dimensions taken from bench marks, columns, walls, or floors. Rough-in lighting fixtures and appliance outlet boxes to general locations before installation of walls and furring and reset to exact dimensions as walls and furring are constructed. Set outlet boxes true to horizontal and vertical finish lines of building.

- C. Install outlet boxes accessible. Provide outlet boxes above piping or ductwork with extension stems or offsets as required to clear piping and ductwork.
- D. Install bottom of switch outlet boxes 48" above floor unless otherwise called for or required by wainscot, counter, etc. Install bottom of receptacle outlet boxes 16" above floor unless otherwise called for on drawings. Adjust mounting heights to nearest masonry joint for minimum cutting in case of flush outlets.

2.9 PULL BOXES, WIREWAYS AND GUTTERS

- A. Provide Alwalt, Keystone, Universal or equivalent code gauge pull boxes, wireways, and gutters indicated or required for installation, sized to conform with NEC rules. Provide complete with necessary fittings, interconnecting nipples, insulating bushings, conductor supports, covers, gaskets, partitions, etc. as required.
- B. Special items may be fabricated locally, to same general design and specifications as those listed in specified manufacturer's catalogs. Provide free of burrs, sharp edges, unreamed holes, sharp pointed screws or bolts, and finished with one coat of suitable enamel inside and out, prior to mounting.
- C. Provide sectional covers for easy removal.

END OF SECTION 26 1100

SECTION 26 1200 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL (Reference Section 260500)

PART 2 - PRODUCTS

2.1 INSERTS, HANGERS

- A. Support vertical and horizontal conduit runs at intervals not greater than 10 feet, within 3 feet of any bend and at every outlet or junction box. All junction boxes and device backboxes shall be supported independently of the connected conduit system.
- B. Install multiple runs of conduits as follows:
 - 1. Where a number of conduits are to be run exposed and parallel, group and support with trapeze hangers.
 - 2. Fasten hanger rods to structural steel members with suitable beam clamps and to concrete structures with inserts set flush with surface. Install concrete inserts with reinforced rod through opening provided in inserts.
 - 3. Inserts shall be Grinnell figure 279, 281, 282, or 285 or equivalent as required by load and concrete thickness.
 - 4. Provide beam clamps suitable for structural members and conditions.
 - 5. Provide 3/8" minimum diameter steel hangers rods galvanized or cadmium plated finish.
 - 6. Trapeze hangers shall be Kindorf Series 900 channel with fittings and accessories as required.
 - 7. Attach each conduit to trapeze hanger with Steel City No. C-105 clamps for rigid conduit and Steel City No. C-106 clamps for electrical metallic tubing. (EMT).
- C. Install clamps for single conduit runs as follows:
 - 1. Support individual runs by approved pipe straps, secured by toggle bolts on hollow masonry; expansion shields and machine screws or standard preset inserts on concrete or solid masonry; machine screws or bolts on metal surfaces; and wood screws on wood construction. Use of perforated strap not permitted.
 - 2. Install exposed conduits in damp locations with clamp backs under each conduit clamp to prevent accumulation of moisture around conduits.
 - 3. Provide inserts, hangers and accessories with finish as follows:
 - a. Galvanized: Concrete inserts and pipe straps.
 - b. Galvanized or Cadmium Plated: Steel bolts, nuts, washers and screws.
 - c. Painted with Prime Coat: Individual hangers, trapeze hangers and rods.
- D. Equivalent hangers and support systems by Binkley, Fee and Mason, Kin-Line or Unistrut.

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 26 1200

SECTION 26 2200 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL (Reference Section 260500)

1.1 GENERAL REQUIREMENTS

- A. Supplement grounded neutral of secondary distribution system with equipment grounding system, installed so that metallic structures, enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, portable equipment and other conductive items operate continuously at ground potential and provide low impedance path for ground fault currents.
- B. System shall comply with National Electrical Code.

PART 2 - PRODUCTS

2.1 GROUNDING CONNECTIONS

- A. Equipment grounding conductors for branch circuit home runs shown on the drawings shall indicate an individual and separate ground conductor for that branch circuit which shall be terminated at the branch circuit panelboard, switchboard, or other distribution equipment. No sharing of equipment grounding conductors sized according to the size of the overcurrent device and NEC Table 250.122 shall be allowed.
- B. Required equipment grounding conductors and straps shall be sized in compliance with N.E.C. Table 250.122. Equipment grounding conductors shall be provided with green type TW 600 volt insulation. Related feeder and branch circuit grounding conductors shall be connected to ground bus with approved pressure connectors. Provide feeder servicing several panelboards with a continuous grounding conductor connected to each related panelboard ground bus. Installation shall include necessary precautions regarding terminations with dissimilar metals.
- C. Provide low voltage distribution system with a separate green insulated equipment grounding conductor for each raceway containing single or three-phase feeder. Single phase 120 volt branch circuits for lighting and power shall consist of phase and neutral conductors and a green ground conductor installed in common metallic conduit which shall serve as grounding conductor. Provide flexible metallic conduit utilized in conjunction with above single phase branch circuits with suitable green insulated grounding conductors connected to approved grounding terminals at each end of flexible conduit. Single phase branch circuit installed in nonmetallic conduits shall be provided with separate grounding conductor. Install grounding conductor in common conduit with related phase and/or neutral conductors.
- G. Provide steel and aluminum conduits which terminate without mechanical connection to metallic housing of electrical equipment with ground bushing and connect each bushing with bare copper conductor to ground bus in electrical equipment. Electrically non-continuous metallic conduits containing ground wiring only shall be bonded to ground wire at both conduit entrance and exit.
- H. Provide grounding bushings on all feeder conduits. Bond grounding bushing to ground bus in respective panelboard.
- I. Grounding conductors shall be as shown on plans or if not specifically shown shall be no smaller than that required by the NEC.

END OF SECTION 26 2200

SECTION 268500 - FIRE ALARM SYSTEM

PART 1 - GENERAL

A. SCOPE

1. The work covered by this Section consists of furnishing all labor, materials, tools, equipment, services, coordination, and supervision required to install, test, and place in service additions to the existing fire alarm system.
2. All system operations shall comply with the complete NFPA 72, (2010 Edition). In the event that discrepancies arise between contract documents, local codes and ordinances the more stringent requirement will apply.
3. All work performed and all materials furnished shall meet the requirements of the applicable current standards of the National Fire Protection Association (NFPA): 72-2010; Underwriters' Laboratories, Inc. (UL); Americans with Disabilities Act and other federal, state, and local codes and ordinances except as otherwise indicated on the drawings or specified herein.
4. After entering into the contract, the Contractor shall be held responsible for the completion of all work necessary within the time frame of the owner's completion scheduled date for a complete and approved installation without extra expense to the Owner or Engineer. The Contractor shall prepare any supplementary detailed diagrams or drawings, which may be required by the state authority or local Authority Having Jurisdiction (AHJ).
5. Any deviations from the requirements of this specification must be acknowledged in writing to the Engineer prior the supplier's bid offer.

B. APPLICABLE REFERENCES

1. National Fire Protection Association (NFPA): As indicated on Project Code Plan.
2. All materials and equipment furnished and installed under this Section shall be new and currently listed by UL, Inc., or approved by FM Engineering Corporation for use in fire protection equipment except as otherwise specified herein.

PART 2 - PRODUCTS

- A. All equipment and products furnished shall be UL listed or FM approved and labeled, and connection shall comply with NEMA construction standards.

B. DEVICES

1. Smoke/Heat Detectors: Detectors shall be photoelectric type combination smoke/heat. The smoke detectors shall comply with UL 268, "Smoke Detectors for Fire Protective Signaling Systems" and shall include the following features:
 - a) Factory Nameplate: Serial number and type identification.
 - b) Combination smoke/heat detectors.
 - c) Operating Voltage: 24 VDC, nominal.
 - d) Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 - e) Visual Indicator: Each sensor base shall contain an LED that will flash as an indication of proper sensor operation. Sensors that do not provide a visible indication of an abnormal condition at the sensor location shall not be acceptable.

C. FIRE ALARM AUDIBLE/VISUALS AND VISUALS AND AUDIBLES ONLY

1. General: Visual and audio/visual indicating appliances shall be Potter Select- A-Strobe Model SL-1224. These devices shall have a minimum of 6 candela settings. The candela settings shall be selectable using a drum roller and shall display the candela settings on the front of the device. The visual appliance shall have a 1 HZ flash rate. The light unit shall be of ABS polycarbonate and the lens of high grade, optical quality LEXAN.
2. All visual appliances shall be in compliance with ADA and as indicated on the drawings providing synchronization as required.
3. Audible appliances shall provide a minimum 90 dBA sound level at 10 feet with a 1kHz signal.

D. FIRE ALARM ELECTRICAL IDENTIFICATION

1. All electrical identification shall comply with the requirements found in the NFPA 70 2011 Edition.

E. WIRE

1. All wire shall comply with the requirements found in the NFPA 70 2011 Edition. All wiring shall be installed in a minimum of ¾ inch metallic conduit in all areas with exposed structure and concealed spaces created by hard ceiling or other type of permanent ceiling or wall covering.
2. All wiring shall be THHN or TFFN stranded with crimp on terminal ends affixed.
3. Wire shall be in strict accordance with manufacturer's published installation recommendations, Article 760 of NFPA 70 (2011 Edition), the drawings, and these specifications.
4. Splicing of wire shall not be permitted. All wiring is to be continuous from panel to device and device. Terminal blocks shall be used only where absolutely necessary.
5. The use of wire nuts is prohibited.
6. All wiring shall be color-coded and fully identified. Provide the proposed color code with the submittal documentation.
7. The use of plenum rated cable shall be permitted in areas with lay-in ceiling tile. Support all cable to the building structure with J-hooks and Bridal Rings.

PART 3 - EXECUTION

A. GENERAL REQUIREMENTS

1. System installation shall be in full accordance with the requirements found in the, drawings, specifications, NFPA Standards, and the manufacturer's published recommendations.
2. The work required as a part of this project involves extension and minor additions to an existing Fire Alarm System. All new fire alarm appliances shall be provided by the vendor who currently provides fire alarm systems and maintenance to the Campus.

B. WIRING INSTALLATION

1. All wire shall be installed in accordance with the requirements found in the NFPA 70 2011 Edition.
2. All detection and alarm wire shall be installed in separate conduits where required. Each circuit outgoing and return conductors exiting and returning to the control unit respectively are to be routed separately as required by NFPA 72. Conduit shall be EMT. Exception would be those locations deemed unsuitable for EMT conduit. In such cases, use Rigid or PVC type conduit. Minimum conduit size shall be ¾". Alarm and supervisory wiring shall be in separate conduits. All conduletes and junction boxes shall be identified through color coding and labeling.
3. All fire detection and alarm system wiring required to be installed in conduit shall minimum ¾" EMT conduit complete and shall be clearly identified.
4. Minimum fire alarm circuit size shall be as follows:
 - a) Initiating device circuits shall be a minimum of AWG No. 18.

- b) Notifications Appliance Circuits shall be AWG No. 14 or larger.
- c) Line voltage circuits shall be AWG No. 12 or larger.

5. Wiring Method:

- a) All wiring raceways shall be in accordance with NFPA 72 and Article 760 of NFPA 70. Physical raceways for fire alarm circuits shall be a minimum of $\frac{3}{4}$ inch.
- b) System drain wires and conduit grounding shall be properly installed in accordance with the manufacturer's published recommendations.
- c) Wiring splices shall be held to an absolute minimum and avoided to the extent possible. If needed, they shall be made only in junction or outlet boxes and shall be connected on terminal blocks with crimp-type connectors.

6. Protection, Cleaning, and Adjustment

- a) Protection from damage and contamination shall be provided for all system components, devices, and equipment during the entire installation and until acceptance testing.
- b) Damaged or contaminated devices and/or components shall be replaced before final testing.
- c) Final system adjustment, including detector sensitivity, shall be provided before final acceptance testing.

C. TESTING

1. All test equipment, instruments, tools and labor required to conduct the system tests shall be provided by the Contractor. As a minimum for conducting the tests, ladders; multimeter; two-way radios; flashlights; smoke generation devices and supplies, and; decibel meter shall be available.
2. All initiating devices shall be tested and logged for correct operation. Smoke/heat detectors shall be tested for sensitivity using test equipment specifically designed for that purpose. Sensitivity shall be documented on the test report.
3. Presence of a manufacturer's authorized technical representative shall be required at all acceptance tests and retests.
4. Acceptance testing shall be in accordance with the procedures outlined in NFPA 72, the manufacturer's recommendations, and the direction of the Engineer and AHJ.
5. System wiring shall be tested to demonstrate correct system response and correct subsequent system operation in the event of:
 - a) Open, shorted and grounded addressable signaling circuit.
 - b) Open, shorted and grounded circuits.
 - c) Open, shorted and grounded horn circuits.
 - d) Addressable device removal.
 - e) Primary power or battery disconnected.
 - f) Incorrect device at address.
6. System evacuation alarm indicating appliances shall be demonstrated as follows:
 - a) All new alarm notification appliances operate as programmed.
 - b) The ambient sound level of each room, included as a part of the project, shall be recorded and the sound level of the audible devices in each room shall be recorded to verify the performance of the system.
7. System indications shall be demonstrated as follows:
 - a) Correct message display for each alarm input at the control panel, network workstations and remote alpha-numeric display.

D. CLEANING AND ADJUSTING

1. Cleaning: Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean units internally using methods and materials recommended by manufacturer.
2. Occupancy Adjustments: When requested within one year of date of Substantial Completion, provide on-site assistance in adjusting sound levels and adjusting controls and sensitivities to suit actual occupied conditions. Provide up to three visits at eight hours a piece to the site for this purpose.

END OF SECTION 268500

END OF DIVISION 26

SECTION 270500 – COMMUNICATIONS GENERAL PROVISIONS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 CONTRACT DOCUMENTS

- A. All contract documents including drawings; alternates, addenda and modifications preceding this division of this specification are applicable to contractors, subcontractors, and material suppliers.

1.3 SPECIFICATION FORM AND DEFINITION

- A. These Specifications are abbreviated form and contain incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "shall be", "as noted on the drawings", "according to the drawings", "a", "an", "the" and "all" are intentional. Omitted words and phrases shall be supplied by inference.
- B. Engineer, wherever used in these specifications shall mean LATIMER, SOMMERS & ASSOCIATES, P.A., ENGINEERS, 3639 SW Summerfield Drive, Suite A, Topeka, Kansas 66614, 785-233-3232, FAX 785-233-0647.
- C. Contractor and/or Telecommunications Contractor hereinafter abbreviated T/C, wherever used in these specifications, shall mean the Company that enters into contract with Owner to perform this work.
- D. When a word, such as "proper", "satisfactory", "equivalent", and "as directed" is used, it required Engineer's review.
- E. "Provide" means furnish and install.
- F. Architect-Engineer hereinafter abbreviated A/E shall mean both the Design Architects and the Design Engineers.
- G. Equipment and/or materials manufacturer hereinafter abbreviated E/M shall mean the manufacturer of equipment or materials specified or referred to.

1.4 QUALIFICATIONS

- A. The contractor(s) responsible for work under this section shall have completed a job of similar scope and magnitude within the last 3 years. They shall provide a list of said projects including Project Name, Project Address, Contact Name, Contact Telephone and Project Status.
- B. The contractor(s) shall employ an experienced, competent and adequate work force licensed in their specific trade and properly supervised at all times. Unlicensed workers and general laborers shall be adequately supervised to insure competent and quality work and workmanship required by this contract and all other regulations, codes and practices.
- C. At all times the contractor(s) shall comply with all applicable local, state and federal guidelines, practices and regulations. Contractor may be required to submit a statement of qualifications upon request before any final approval and selection. Failure to be able to comply with these requirements is suitable reason for rejection of a bid.

- D. The Telecommunications contractor must have vendor approved and certified technicians that will install the cable system. **A copy of certification documents must be submitted with the quote in order for such quote to be valid.** The Telecommunications Contractor is responsible for workmanship and installation practices in accordance with the specific vendor solution that is proposed.
- E. The lead technician on the job site shall be certified by the manufacturer in the installation of the product and /or hold a BICSI, Technicians Level I or II certification.
- F. The T/C shall have a BICSI Certified Registered Communications Distribution Designer (RCDD) employed by their company (on their staff not a contract employee) that will be involved with the installation and project management of the job. The RCDD's name and company must be verifiable on the BICSI website and match the company name of bidder. **A copy of certification documents must be submitted with the quote in order for such quote to be valid.** Telecommunications Contractors that do not have an RCDD on staff may submit a list of (3) project references that include contact information, and project manager qualifications to Engineer prior to bid date to be considered. Submittal of references does not mean the Telecommunications Contractor will be approved to bid. Only the contractors receiving the invitation to bid, listed on a addendum, or approved in writing by Engineer will be considered.
- G. The RCDD shall be required to inspect the installation on a regular basis and submit in writing that they certify the installation to meet all EIA/TIA and NEC standards and codes.
- H. The RCDD shall review the individual cable test results and certify that they are within the acceptable parameters.
- I. The RCDD shall also be required to put into writing that the installation was built per the specifications and construction drawings.

1.5 LOCAL CONDITIONS

- A. Visit site and determine existing local conditions affecting work in contract.
- B. Failure to determine site conditions or nature of existing or new construction will not be considered basis for granting additional compensation.

1.6 CONTRACT CHANGES

- A. Changes or deviations from contract, including those for extra or additional work must be submitted in writing for review of Architect-Engineer. No verbal orders will be recognized.

1.7 LOCATIONS AND INTERFERENCES

- A. Locations of equipment, conduit and other telecommunications work are indicated diagrammatically by telecommunications drawings. Layout work from dimensions on Architectural and Structural Drawings. Verify equipment size from manufacturers shop drawings.
- B. Study and become familiar with contract drawings of other trades and in particular general construction drawings and details in order to obtain necessary information for figuring installation. Cooperate with other workers and install work in such a way to avoid interference with their Work. Minor deviations, not affecting design characteristics, performance or space limitation may be permitted if reviewed prior to installation by A/E.

- C. Should the requirements of work or systems installed by other trades require specific placement of conduit, apparatus, appliances or other telecommunications item, these requirements shall be adhered to. Should these requirements result in major deviations in placement from that indicated on the plans or specifications, the condition shall be reviewed by A/E prior to the placement of the work.
- D. Any conduit, apparatus, appliance or other telecommunications item interfering with proper placement of other work as indicated on drawings, specified, or required, shall be removed and if so shown relocated and reconnected without extra cost. Damage to other Work caused by this contractor, subcontractor, workers or any cause whatsoever, shall be restored as specified for new work.
- E. Do not scale telecommunications drawings for dimensions. Accurately layout work from dimensions indicated on Architectural drawings unless such is found in error.

1.8 PERFORMANCE

- A. Final acceptance of work shall be subject to the condition that all systems, equipment, apparatus and appliances operate satisfactorily as designed and intended. Work shall include required adjustment of systems and control equipment installed under this specification division.

1.9 WARRANTY

- A. T/C warrants to Owner and Engineer the quality of materials, equipment, workmanship and operation of equipment provided under this specification division for a period of one year from and after completion of building and acceptance of telecommunications systems by Owner.
- B. Contractor warrants to Owner and Engineer that on receipt of notice from either of them within one year of warranty period following date of acceptance all defects that have appeared in materials and/or workmanship, shall be promptly corrected to condition required by contract documents at T/C's expense.
- C. The warranty above expressed shall not supersede any separately stated warranty or requirements required by law or by these specifications.

1.10 ALTERNATES

- A. Refer to General Requirements and description for alternate bid items.

1.11 MATERIALS AND EQUIPMENT SUBSTITUTION

- A. The intent of these specifications is to allow ample opportunity for Contractor to use ingenuity and ability to perform the work to his and Owner's best advantage, and to permit maximum competition in bidding on standards of materials and equipment required.
- B. Material and equipment installed under this contract shall be first class quality, new, unused and without damage.
- C. In general, these specifications identify required materials and equipment by naming first the manufacturer whose product was used as the basis for the project design and specifications. The manufacturer's product, series, model, catalog and/or identification numbers shall set quality and capacity requirements for comparing the equivalency of other manufacturer's products. Where other manufacturers names are listed they are considered an approved manufacturer for the product specified, however; the listing of their names implies no prior approval of any product they may propose to furnish as equivalent to the first named product unless specific model or catalog numbers are listed in these specifications or in subsequent addenda. Where other than first named products are used for Telecommunications Contractor base bid proposal it shall be the responsibility of the Telecommunications

Contractor to determine prior to bid time that the proposed materials and equipment selections are products of approved manufacturers which meet or exceed the specifications and are acceptable to the Engineer.

- D. Where materials or equipment are described but not named, provide required items of first quality, adequate in every respect for intended use. Such items shall be submitted to Architect-Engineer for review and approval prior to procurement.
- E. If the Contractor wishes to incorporate products other than those named in the Base Bid Specifications they shall submit a request for approval of equivalency in writing no later than (10) ten calendar days prior to bid date. Substitutions after this may be refused at Engineers option. Equivalents will ONLY be considered approved when listed by addendum.
- F. Materials and equipment proposed for substitution shall be equal to or superior to that specified in construction efficiency, utility, aesthetic design, and color as determined by Architect-Engineer whose decision shall be final and without further recourse. Physical size of substitute brand shall be no larger than space provided including allowances for access, forward two copies of complete descriptive and technical data including manufacturer's name, model and catalog number, photographs or cuts, physical dimensions, operating characteristics and any other information needed for comparison.
- G. Within 10 working days after bids are received, apparent low bidder shall submit to A/E for approval three copies of a list of all major items of equipment he intends to provide. As soon as practicable and within 3 working days after award of contract, Contractor shall submit shop drawings for equipment and materials to be incorporated in work for Architect/Engineer's review. Where 30 working day limit is insufficient for preparation of detailed shop drawings on major equipment or assemblies, Contractor shall submit manufacturer's descriptive catalog data and indicate date such detailed shop drawings will be submitted along with manufacturer's certifications that order was placed within 30 working day limit.

1.12 DRAWINGS, OPERATION AND MAINTENANCE INSTRUCTIONS

- A. Contractor shall furnish a minimum of two (2) sets of shop drawings of all materials and equipment. Architect/Engineer will retain one (1) set.
- B. Where catalog cuts are submitted for review, conspicuously mark or provide schedule of equipment, capacities, controls, sizes, etc., that are to be provided. Mark each submitted item with applicable section and paragraph numbers of these specifications, or plan sheet number when item does not appear in specifications or specified equivalent, mark submittals with applicable alternate numbers, change order number or letters of authorization. Each submittal shall contain at least two (2) sets of original catalog cuts. Each catalog sheet shall bear equipment manufacturer's name, address and phone number. All shop drawings on materials and equipment listed by UL shall indicate UL approval on submittal.
- C. Contractor shall check all shop drawings to verify that they meet specifications and/or drawing requirements before forwarding submittals to the Architect/Engineer for their review.
- D. All shop drawings submitted to Architect/Engineer shall bear Contractor's approval stamp which shall indicate that Contractor has reviewed submittals and that they meet specification and/or drawing requirements. Contractor's submittal review shall specifically check for but not be limited to the following: telecommunications and electrical characteristics, provisions for supply, and drainage connections to building systems. All shop drawings not meeting contractor's approval shall be returned to supplier for resubmittal.
- E. No shop drawing submittals will be considered for review by the Architect/Engineer without Contractor's approval stamp, or that have extensive changes made on the original submittal as a result of contractor's review.

- F. Architect/Engineer will not be responsible for or the cost of returning shop drawing submittals that are submitted to them without Contractor's review and approval stamp.
- G. Architect/Engineer's review of shop drawings will not relieve Contractor of responsibility for deviations from drawings and specifications unless such deviations have been specifically approved in writing by Owner or the representative, nor shall it relieve Contractor of responsibility for error in shop drawings. No work shall be fabricated until A/E's review has been obtained. Any time delay caused by correcting and resubmitting shop drawings will be Contractor's responsibility.
- H. Submit with shop drawings of equipment, two (2) sets of operating and maintenance instructions and parts lists for all items of equipment provided. Instructions shall be prepared by equipment manufacturer.
- I. Keep in safe place, keys and wrenches furnished with equipment under this contract. Present to Owner and obtain receipt for same upon completion of project.
- J. Prepare a complete brochure, covering systems and equipment provided and installed under his contract. Submit brochures to Architect/Engineer for review before delivery to Owner. Contractor at his option may prepare this brochure or retain an individual to prepare it for him. Include cost of this service in bid. Brochures shall contain following:
- K. Certified equipment drawings/or catalog data with equipment provided clearly marked as outlined under Section this specification.
- L. Complete installation, operating, maintenance instructions and parts lists for each item of equipment.
- M. Special emergency operating instructions with a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to various parts of system.
- N. The drawings are to include cable routes and outlet locations. Outlet locations shall be identified by their sequential number as defined elsewhere in this document. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2007) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner/Owner's Representative.
- O. The Contractors shall annotate the base drawings and return a hard copy (same plot size as originals) and compact disk (AutoCAD 2007) format.
- P. Provide brochure bound in black vinyl three-ring binders with metal hinge. Reinforce binding edge of each sheet of loose-leaf type brochure to prevent tearing from continued usage. Clearly print on label insert of each brochure:
 - 1. Project name and address.
 - 2. Section of work covered by brochure, i.e., Telecommunications, Paging, etc.

1.13 CUTTING AND PATCHING

- A. Contractor shall do cutting and patching of building materials required for installation of work herein specified. Cut no structural members without Architect/Engineer's approval and in a manner approved by him.
- B. Patching shall be by mechanics of particular trade involved and shall meet approval of Architect/Engineer.

- C. Drilling and cutting of openings through building materials requires Architect's review and approval. Make openings in concrete with concrete hole saw or concrete drill. Use of star drill or air hammer for this work will not be permitted.

1.14 MUTILATION

- A. Mutilation of building finishes, caused by installation of telecommunications equipment, fixtures, outlets and other telecommunications devices shall be repaired at Contractor's expense to approval of Architect.

1.15 SETTING, ADJUSTMENT AND EQUIPMENT SUPPORTS

- A. Work shall include mounting, alignment and adjustment of systems and equipment. Set equipment level on adequate foundations and provide proper anchor bolts and isolation as shown or specified. Level, shim, and grout equipment bases as recommended by manufacturer. Equipment failures resulting from improper installation shall be repaired or replaced by Contractor at no cost to Owner.
- B. Provide each piece of equipment or apparatus suspended from ceiling or mounted above floor level with suitable structural support, platform or carrier in accordance with Building Industry Consulting Services International (BICSI) Telecommunications Distribution Methods Manual (TDM) and/or best recognized industry practice. Telecommunications contractor shall arrange for attachment to building structure, unless otherwise indicated on drawings or as specified. Provide hangers with vibration eliminators where required. Contractor shall verify that structural members of building are adequate to support equipment. Submit details of hangers, platforms and supports together with total weights of mounted equipment to Architect/Engineer for review before proceeding with fabrication or installation.

1.16 FINAL CONSTRUCTION REVIEW

- A. At final construction review, Telecommunications Contractor and major sub-contractors shall be present or shall be represented by a person of authority. Contractor shall demonstrate, as directed by Architect/Engineer, that the work complies with purpose and intent of plans and specifications. Contractor shall provide labor, services, instruments or tools necessary for such demonstrations and tests.

1.17 OPENINGS, ACCESS PANELS AND SLEEVES

- A. Contractor shall provide all boxes, access panels and sleeves for openings required to install his work, except structural openings incorporated in the structural drawings unless noted otherwise. Sleeves shall be installed for all cables passing through structural slabs and walls. Contractor shall set and verify the location of sleeves as shown on structural plans that pass through beams, only if so shown. All floor and wall penetrations shall be sealed to meet fire rating requirements.

END OF SECTION 270500

SECTION 271500 – TELECOMMUNICATIONS

PART 1 - GENERAL SPECIFICATIONS

1.1 SCOPE

- A. This document describes the products and execution requirements relating to furnishing and installing Voice & Data. Horizontal cabling comprised of twisted pair category 6, series 6 coax, and support systems are covered under this document.
- B. The Horizontal (workstation) Cabling System shall consist of a minimum of 4-pair Unshielded Twisted Pair (UTP) Copper Cables to each work area outlet unless otherwise noted for specific locations. Cables shall be installed from the Work Area Outlet to the Telecommunications Room (TR). In the Telecommunications Room, they shall be routed to the appropriate rack and terminated as specified in this document.
- C. The work specified in this division of the specification and on the “T”, sheets must be completed thirty (30) days prior to substantial completion of the overall project. This thirty (30) day period is for the owner to provision the system prior to occupancy.
- D. All cables and related terminations, support and grounding hardware shall be furnished, installed, wired, tested, labeled, and documented by the Telecommunications Contractor as detailed in this document and the project drawings.
- E. Product specifications, general design considerations, and installation guidelines are provided in this document. Typical installation details, cable routing and outlet location and types will be provided on the project drawings, an attachment to this document. If the bid documents are in conflict, this specification shall take precedence. The successful vendor shall meet or exceed all requirements for the cable system described in this document.

1.2 REGULATORY REFERENCES

- A. All work and materials shall conform in every detail to the rules and requirements of the National Fire Protection Association, NEC, the local Electrical Code, authority having jurisdiction and present manufacturing standards.
- B. All materials shall be UL Listed and shall be marked as such. If UL has no published standards for a particular item, then other national independent testing standards shall apply and such items shall bear those labels. Where UL has an applicable system listing and label, the entire system shall be so labeled.
- C. The performance of all modular jacks, patch cords, consolidation points, and patch panels shall be Category 6 components and channel compliant and/or meet and adhere to the below defined standards.
- D. The cabling system described in this is derived from the recommendations made in recognized telecommunications industry standards. The following documents are incorporated by reference:
 - 1. ANSI/TIA-568 (Most Current): Telecommunications Cabling Standards.
 - 2. ANSI/TIA-569-D: Commercial Building Standard for Telecommunications Pathways and Spaces.
 - 3. ANSI/TIA-607-C: Commercial Grounding – Earthing Standards.
 - 4. BICSI - TDMM, Building Industries Consulting Services International, Telecommunications Distribution Methods Manual (TDMM) – 13th Edition, 2014.

- 5. National Fire Protection Agency (NFPA – 70).
- 6. National Electrical Code (NEC) – 2002.

- E. If this document and any of the documents listed above are in conflict, then the more stringent requirement shall apply. All documents listed are believed to be the most current releases of the documents. The Contractor has the responsibility to determine and adhere to the most recent release when developing the proposal for installation.
- F. This document does not replace any code, either partially or wholly. The contractor is responsible for adherence of all codes, including local codes, and the authority having jurisdiction which may affect this project.

1.3 APPROVED CONTRACTOR

- A. The Telecommunications contractor must have vendor approved and certified technicians that will install the cable system. **A copy of certification documents must be submitted with the quote in order for such quote to be valid.** The Telecommunications Contractor is responsible for workmanship and installation practices in accordance with the specific vendor solution that is proposed.
- B. The lead technician on the job site shall be certified by the manufacturer in the installation of the product and /or hold a BICSI, Technicians Level I or II certification.
- C. The T/C shall have a BICSI Certified Registered Communications Distribution Designer (RCDD) employed by their company (on their staff not a contract employee) that will be involved with the installation and project management of the job. The RCDD's name and company must be verifiable on the BICSI website and match the company name of bidder. **A copy of certification documents must be submitted with the quote in order for such quote to be valid.** Telecommunications Contractors that do not have an RCDD on staff may submit a list of (3) project references that include contact information, and project manager qualifications to Engineer prior to bid date to be considered. Submittal of references does not mean the Telecommunications Contractor will be approved to bid. Only the contractors receiving the invitation to bid, listed on a addendum, or approved in writing by Engineer will be considered.
- D. The RCDD shall be required to inspect the installation on a regular basis and submit in writing that they certify the installation to meet all EIA/TIA and NEC standards and codes.
- E. The RCDD shall review the individual cable test results and certify that they are within the acceptable parameters.
- F. The RCDD shall also be required to put into writing that the installation was built per the specifications and construction drawings.

1.4 APPROVED PRODUCTS

- A. The approved products are specified in this document and on the drawings for the horizontal and backbone systems. The telecommunications drawings indicate the associated part number/equivalent. Product and item numbers are defined in later sections of this document or indicated on the drawings.

1.5 WORK INCLUDED

- A. The work included under this specification consists of furnishing all labor; equipment, materials, supplies and performing all operations necessary to complete the installation of this structured cabling system in compliance with the specifications and drawings. The Telecommunications Contractor will provide and install all of the required material to form a complete system whether specifically addressed in the technical specifications or not.

- B. The work shall include, but not be limited to the following:
 - 1. Furnish, install and terminate a complete communications infrastructure including wall plates, jacks patch panels, patch cords, cabinets and/or racks and any other material required to form a complete system.
 - 2. Perform link testing (100% of horizontal and/or backbone links/channels) and certification of all components.
 - 3. Furnish two (2) sets of test results of all cabling to the Owner/Owner's Representative on compact disk and paper format, listed by each closet, then by workstation ID.
 - 4. Adhere and comply with all requirements of the manufacturer of the products proposed in this specification.
 - 5. Provide owner orientation of the overall cable system and cable system documentation. (As-built drawings)

1.6 SUBMITTALS

- A. Under the provisions of this request for proposal, prior to the start of work the telecommunications contractor shall:
 - 1. Submit copies of the certification of the company and names of staff that will be performing the installation and termination of the installation to provide proof of compliance of this specification.
 - 2. Submit proof from manufacturer of contractor's good standing in manufacturer's program.
 - 3. Submit appropriate cut sheets for all products, hardware and cabling if different from the products that are called out in this specification.
 - a. Work shall not proceed without the Owner/Owner's Representative approval of the submitted items.
 - b. The telecommunications contractor must receive written approval from the Owner/Owner's Representative on all substitutions of material. Substituted materials shall not be installed except by written approval from the Owner/Owner's Representative.

1.7 QUALITY ASSURANCE

- A. The telecommunications contractor shall be a company specializing in communication cabling installation. Building Industry Consulting Services International (BICSI), or the proposed system solution vendor, must certify 30 percent of the termination crew for copper and 10 percent of the termination crew for fiber with a Technicians Level of Training.

- B. The T/C shall have a BICSI Certified Registered Communications Distribution Designer (RCDD) employed by their company that will be involved with the installation and project management of the job.

1.8 STORAGE AND HANDLING

- A. Cable shall be stored according to manufacturer's recommendations as a minimum. In addition, cable must be stored in a location protected from vandalism and weather. If necessary, cable shall be stored off site at the contractor's expense.
- B. If the telecommunications contractor wishes to have a trailer on site for storage of materials, arrangements shall be made with the Owner/Owner's Representative.

1.9 DRAWINGS

- A. It shall be understood that the telecommunications details and drawings provided with the specification package are diagrammatic. They are included to show the intent of the specifications and to aid the telecommunications contractor in bidding the job. The telecommunications contractor shall make allowance in the bid proposal to cover whatever work is required to comply with the intent of the plans and specifications.
- B. The telecommunications contractor shall verify all dimensions and be responsible for their accuracy.
- C. Before submitting the bid, the telecommunications contractor shall call to the attention of the Engineer any materials or apparatus the telecommunications contractor believes to be inadequate and to any necessary items of work omitted.

1.10 WARRANTY

- A. An Extended Product Warranty shall be provided which warrants functionality of all components used in the vendor system solution for 20 years from the date of registration. The Extended Product Warranty shall warrant the installed horizontal and/or backbone copper and fiber.
- B. The Application Assurance Warranty shall cover the failure of the wiring system to support the applications that are designed for the link/channel specifications of ANSI/TIA/EIA-568-B.2.1. These applications include, but are not limited to, 10BASE-T, 100BASE-T, 1000BASE-T, and 155 Mb/s ATM.
- C. The contractor shall provide a warranty on the physical installation of not less than one year at no cost to the owner. Information with regard to the proper procedures to follow if needed should be included with the warranty. They should include but not be limited to; contact name, contact telephone number, project reference, anticipated response time.

1.11 FINAL ACCEPTANCE & SYSTEM CERTIFICATION

- A. Final Acceptance of the implemented cable system solution will be provided in writing from the Owner / Owner's Representative. It will be issued upon successful completion of the installation, including but not limited to, final inspections, receipt of the successful test results and as-built documentation, and successful performance of the cabling system for a thirty-day period. Upon successful completion of the installation and subsequent inspection, the Owner/Owner's Representative shall be provided with a numbered certificate, from the Manufacturer of the installed system solution. This Extended Product Warranty shall be provided within thirty days of the completion of the project. Final payment will not be made until such warranty / numbered certificate is received.

PART 2 – PRODUCTS

2.1 EQUIVALENT PRODUCTS

- A. Equivalent products are listed on drawings where approved.

2.2 WORK AREA OUTLETS

- A. Work area cables shall each be terminated at their designated work area location in the connector types described in the subsections below. Included are modular telecommunication jacks. These connector assemblies shall snap into a faceplate from the front.
- B. The Telecommunications Outlet Assembly shall accommodate:
 - 1. The number of jacks as noted on the project drawings.
 - 2. Additional accommodations for specific locations as noted in the plans for optical fiber and/or additional copper cables as necessary.
 - 3. A blank filler module will be installed when extra ports are not used.
 - 4. The same orientation and positioning of jacks and connectors shall be utilized throughout the installation. Please refer to typical outlet configuration on project drawings prior to installation.
- C. Printed labels shall be permanent and compliant with ANSI/TIA/EIA-606-B standard specifications. Labels shall be machine printed. Hand written labels shall not be accepted.
 - 1. Faceplates: The faceplates shall:
 - a. be constructed of stainless steel.
 - b. be UL listed and/or match the color of the raceway if installed in surface raceway.
 - c. be available as single-gang or dual-gang and provide for easy access for moves, adds and changes.
 - d. provide designation field to facilitate labeling and identification.
 - e. comply with ANSI/TIA/EIA-606-A work area labeling standard.
 - f. be manufactured by an ISO 9001 registered company.
- D. Voice / Data Jacks
 - 1. Voice/Data jacks shall be 8-position modular jacks and shall meet or exceed Category 6 performance standards as defined by the references in this document. All pair combinations must be considered, with the worst-case measurement being the basis for compliance. Modular jack performance shall be third-party verified by a nationally recognized independent testing laboratory.
 - 2. The modular jack shall be backwards compatible to Category 3, 5, and 5e.
 - 3. The modular jack shall be center tuned to category 6 test specifications.
- E. Video Jacks/Coax Connectors
 - 1. Video jacks shall be “F” connectors and shall be installed in locations per the project drawing.

2.3 MODULAR PATCH PANELS

- A. Modular Category 6 performance rated patch panels shall be used for the horizontal to terminate on. The panels shall be T568B standard, not high density, and use a standard 110-impact tool for termination.

- B. Modular patch panel shall be used to terminate the backbone voice cable on. The panel shall be 8 position,
- C. Modular Patch Panel kit shall be used to terminate coax cables. The kit shall provide for the placement of modules to be snapped in.

2.4 WIRE MANAGEMENT PANELS

- A. Cable management shall be provided above and below every 48 ports of patch / distribution panels or as shown on construction drawings. The wire management panels shall provide horizontal organization of patch cables on the rack.
- B. Wire management panels shall also be required for every 48 ports of network electronics, (i.e. switches, hubs), installed in a rack.

2.5 PATCH CABLES

- A. Category 6 patch cables shall be provided and installed as part of the project. They shall be installed and the remainder to be delivered to the Owner prior to completion of the project. Patch cables shall be provided in the types and quantities indicated on the contract drawings. Owner to provide port assignments.
- B. Fiber optic patch cables shall be provided as part of the project. They shall be installed and the remainder to delivered to the Owner prior to completion of the project. The fiber optic patch cables shall be provided in the types and quantities indicated on the contract drawings. Owner to provide port assignments.

2.6 FIBER TERMINATION CABINETS

- A. Fiber shall be terminated in a rack mountable cabined that will secure, protect and organize fibers for interconnection.

2.7 FIBER AND CONNECTORS

- A. Fiber cables shall be field terminated using LC fusion spliced pigtail type connectors. The connector shall be compliant TIA/EIA 604-3.

2.8 RACKS

- A. All equipment, patch panels, wiring blocks, etc., shall be mounted in self-supporting equipment as indicated on the project drawing. The rack shall be able to support 19” panels and equipment. The equipment rack shall provide vertical cable management and support for the patch cords at the front of the rack and wire management, support, and protection for the horizontal cables inside the legs of the rack. Waterfall cable management shall be provided at the top of the rack, on both sides, for patch cords and for horizontal cables entering the rack channels for protection and to maintain proper bend radius and cable support. The rack shall include mounting brackets for cable tray ladder rack to mount to the top of the rack. Velcro cable ties shall be provided inside the rack channels to support the horizontal cable. Rack shall be black in color to match the patch panels and cable management. Refer to “Rack Detail” on drawings for specific information.

1. Free Standing Rack shall:

- a. provide the necessary strain relief, bend radius and cable routing for proper installation of high performance cross connect products, meeting all specifications of ANSI/TIA/EIA-568-B.

- b. have EIA hole pattern on front and rear.
- c. be available with a standard channel depth.
- d. be available with elcro straps for securing bulk cables inside the vertical U-channels.
- e. provide floor and ceiling access for cable management and distribution.
- f. provide pre-drilled base for floor attachment of rack.
- g. be manufactured by an ISO 9001 registered company.

2.9 HORIZONTAL DISTRIBUTION CABLE

- A. All horizontal cabling must be plenum rated Category 6. The horizontal cable shall be terminated on Category 6 modular patch panels as specified on the drawings. The horizontal cable must pass all Category 6 testing parameters upon completion of installation and termination.

2.10 COAX CABLE

- A. Plenum rated coax cable shall be installed to provide for video service within the facility. It shall run from the respective Telecommunications Room to specific locations as indicated on the project drawings.

2.11 GROUNDING AND BONDING

- A. The facility shall be equipped with a Telecommunications Bonding Backbone (TBB). This backbone shall be used to ground all telecommunications cable shields, equipment, racks, cabinets, raceways, and other associated hardware that has the potential to act as a current carrying conductor. The TBB shall be installed independent of the building's electrical and building ground and shall be designed in accordance with the recommendations contained in the ANSI/TIA/EIA-607 Telecommunications Bonding and Grounding Standard.
- B. The main entrance facility/equipment room in each building shall be equipped with a telecommunications main grounding bus bar (TMGB). Each telecommunications room shall be provided with a telecommunications ground bus bar (TGB). The TMGB shall be connected to the building electrical entrance grounding facility. The intent of this system is to provide a grounding system that is equal in potential to the building electrical ground system. Therefore, ground loop current potential is minimized between telecommunications equipment and the electrical system to which it is attached.
- C. All racks, metallic backboards, cable sheaths, metallic strength members, splice cases, cable trays, etc. entering or residing in the TR or ER shall be grounded to the respective TGB or TMGB using a minimum #6 AWG stranded green insulated copper bonding conductor and compression connectors, or as shown on drawings.
- D. All wires used for telecommunications grounding purposes shall be identified with a green insulation. Black insulated wires shall be identified at each termination point with a wrap of green tape. All cables and bus bars shall be identified and labeled in accordance with the System Documentation Section of this specification.

2.12 FIRESTOP

- A. A firestop system is comprised of the item or items penetrating the fire rated structure, the opening in the structure and the materials and assembly of the materials used to seal the penetrated structure. Firestop systems comprise an effective block for fire, smoke, heat, vapor and pressurized water stream.

- B. All penetrations through fire-rated building structures (walls and floors) shall be sealed with an appropriate firestop system. This requirement applies to through penetrations (complete penetration) and membrane penetrations (through one side of a hollow fire rated structure). Any penetrating item i.e., riser slots and sleeves, cables, conduit, cable tray, and raceways, etc. shall be properly fire stopped.
- C. Fire stop systems shall be UL Classified to ASTM E814 (UL 1479).

2.13 CABLE TRAY

- A. A welded wire mesh, cable management system shall be installed. The open mesh shall permit easy access to the tray and provides continuous ventilation of cables installed in the tray. The open mesh basket tray shall be produced from high mechanical strength steel wire. The welded wire mesh tray must meet applicable Underwriters Laboratories standards and requirements. The open mesh cable tray must have a continuous safety edge wire welded to the top of the tray and wire mesh welded at all intersections.
- B. A continuous insulated number six (6) AWG, stranded green insulated ground conductor shall be installed at one end with all open mesh cable trays. The ground conductor fixing system shall be accomplished by the use of the manufacturer's approved splices and bonding jumpers. Refer to drawings for additional information.

PART 3 – EXECUTION

3.1 WORK AREA OUTLETS

- A. Cables shall be coiled in the in-wall or surface-mount boxes if adequate space is present to house the cable coil without exceeding the manufacturers bend radius. In hollow wall installations where box-eliminators are used, excess wire can be stored in the wall. No more than 12" of UTP and 36" of fiber slack shall be stored in an "in-wall" box, modular furniture raceway, or insulated walls. Excess slack shall be loosely coiled and stored in the ceiling above each drop location when there is not enough space present in the outlet box to store slack cable.
- B. Cables shall be dressed and terminated in accordance with the recommendations made in the ANSI/TIA/EIA-568-B.1 document, manufacturer's recommendations, BICSI and best industry practices.
- C. Pair untwist at the termination shall not exceed 12 mm (one-half inch).
- D. Bend radius of the horizontal cable shall not be less than 4 times the outside diameter of the cable.
- E. The cable jacket shall be maintained to within 25mm (one inch) of the termination point.

3.2 HORIZONTAL DISTRIBUTION CABLE INSTALLATION

- A. Cable shall be installed in accordance with recommendations from the manufacturer, BICSI and best industry practices.
- B. A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in any conduit.
- C. Cable raceways shall not be filled greater than the ANSI/TIA/EIA-569-A maximum fill for the particular raceway type or 40%.

- D. Cables shall be installed in continuous lengths from origin to destination (no splices) except for transition points, or consolidation points as noted on the project drawings. Additional splices, transition points or consolidation points must be approved in writing by the Owner / Owner's Representative.
- E. Cables shall be routed to allow a minimum of three (3) feet of slack in a neat bundle, not coiled behind rack. This cable may be used for future rearrangements and re-terminations.
- F. Where transition points, or consolidation points are allowed, they shall be located in accessible locations and housed in an enclosure intended and suitable for the purpose.
- G. J-hook or trapeze system shall be used to support cable bundles. All horizontal cables shall be supported at a maximum of 48 inch intervals. At no point shall cable(s) rest on acoustic ceiling grids or panels or any other type of ceiling. They also shall not rest on tops of walls, duct work, or piping.
- H. Horizontal distribution cables shall be bundled in groups of not more than 50 cables. Cable bundle quantities in excess of 50 cables may cause deformation of the bottom cables within the bundle and degrade cable performance.
- I. Cable shall be installed above fire-sprinkler systems and shall not be attached to the system or any ancillary equipment or hardware. The cable system and support hardware shall be installed so that it does not obscure any valves, fire alarm conduit, boxes, or other control devices.
- J. Cables shall not be attached to ceiling grid or lighting fixture wires. Where support for horizontal cable is required, the contractor shall install appropriate carriers to support the cabling.
- K. Any cable damaged or exceeding recommended installation or test parameters during installation shall be replaced by the contractor before final acceptance at no cost to the Owner.
- L. Cables shall be identified by a self-adhesive label in accordance with the System Documentation Section of this specification and ANSI/TIA/EIA-606-A. The cable label shall be applied to the cable behind the faceplate on a section of cable that can be accessed by removing the cover plate (6" back from termination point). Brady LAT-18-361-1 or submit sample to engineer for approval prior to installation.
- M. Unshielded twisted pair cable shall be installed so that there are no bends smaller than four times the outside diameter of the cable at any point in the run and at the termination field. The cable's minimum bend radius shall not be exceeded.
- N. Pulling tension on 4-pair UTP cables shall not exceed 25-lb. for a four-pair UTP cable. The cables maximum pulling tension shall not be exceeded.
- O. The installation of cable shall conform to the following clearances:
 - 1. At 5 inches (127 millimeters) from power lines carrying 2KVA or less.
 - 2. At least 12 inches (305 millimeters) from power lines carrying from 2 to 5 KVA.
 - 3. At least 36 inches (915 millimeters) from power lines carrying more than 5 KVA.
 - 4. At least 2 inches (305 millimeters) from all fluorescent lights and other sources of electromagnetic interference such as electric motors, HVAC equipment, arc welders, intercoms, etc.

3.3 HORIZONTAL CROSS CONNECT INSTALLATION

- A. Cables shall be dressed and terminated in accordance with the recommendations made in the ANSI/TIA/EIA-568-B standard, manufacturer's and BICSI recommendations, and best industry practices.
- B. Cable pair untwist at the termination shall not exceed 13 mm (0.5 inch).
- C. Bend radius of the cable in the termination area shall not exceed 4 times the outside diameter of the cable.
- D. Cables shall be neatly bundled and dressed to their respective panels or blocks. Each panel or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame.
- E. The cable jacket shall be maintained to within 25mm (1 inch) of the termination point.
- F. Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that can be viewed without removing the bundle support ties. Cables labeled within the bundle, where the label is obscured from view shall not be acceptable.

3.4 OPTICAL FIBER TERMINATION HARDWARE

- A. Fiber slack shall be neatly coiled within the fiber splice tray or enclosure. No slack loops shall be allowed external to the fiber panel.
- B. Each cable shall be individually attached to the respective splice enclosure by mechanical means. The cable strength member shall be securely attached to the cable strain relief bracket in the enclosure.
- C. Each fiber bundle shall be stripped upon entering the splice tray and the individual fibers routed in the splice tray.
- D. Each cable shall be clearly labeled at the entrance to the splice enclosure. Cables labeled within the bundle shall not be acceptable.

3.5 BACKBONE CABLE INSTALLATION

- A. Backbone cables shall be installed separately from horizontal distribution cables.
- B. A pull cord (nylon; 1/8" minimum) shall be co-installed with all cable installed in any conduit.
- C. Where cables are housed in conduits, the backbone and horizontal cables shall be installed in separate conduits
- D. Where backbone cables and distribution cables are installed in a cable tray or wire way, backbone cables shall be installed first and bundled separately from the horizontal distribution cables.
- E. All backbone cables shall be securely fastened to the sidewall of the TR using ladder rack or some other comparable hardware.
- F. Backbone cables spanning more than three floors shall be securely attached at the top of the cable run with a wire mesh grip and on alternating floors or as required by local codes.

- G. Vertical runs of cable shall be supported to cable ladder, or other approved method to provide proper support for the weight of the cable.
- H. Large bundles of cables and/or heavy cables shall be attached using metal clamps and/or metal banding to support the cables.

3.6 COPPER TERMINATION HARDWARE

- A. Cables shall be dressed and terminated in accordance with the recommendations made in the ANSI/TIA/EIA-568-B standard, manufacturer's recommendations, BICSI and best industry practice.
- B. Cable pair untwist at the termination shall not exceed 12 mm (one-half inch).
- C. Bend radius of the cable in the termination area shall not exceed 4 times the outside diameter of the cable. Bend radius of cables shall not be exceeded at any time.
- D. Cables shall be neatly bundled and dressed to their respective panels or blocks. Each panel or block shall be fed by an individual bundle separated and dressed back to the point of cable entrance into the rack or frame.
- E. The cable jacket shall be maintained to within 25 mm (one inch) of the termination point.
- F. Each cable shall be clearly labeled on the cable jacket behind the patch panel at a location that can be viewed without removing the bundle support ties. Cables labeled within the bundle, where the label is obscured from view shall not be acceptable.

3.7 RACKS

- A. Racks shall be securely attached to the concrete floor using minimum 3/8" hardware or as required by local codes.
- B. Racks shall be placed as shown on the construction drawings. When possible they shall be placed with a minimum of 36-inch clearance from the walls on all sides.
- C. All racks shall be grounded to the telecommunications ground bus bar.
- D. Rack mount screws not used for installing patch panels and other hardware shall be bagged and left with the rack upon completion of the installation.
- E. Wall mounted termination block fields shall be mounted on 4' x 8' x .75" void free plywood. The plywood shall be mounted vertically 12" above the finished floor. The plywood shall be painted with two coats of white fire retardant paint.

3.8 CABLE TRAY

- A. All open mesh cable tray, shall be installed in accordance with the manufacturer's recommendations. The open mesh cable tray shall be Underwriters Laboratories (UL) compliant upon installation completion.
- B. The open mesh cable tray shall be installed using hardware, splice connectors, support components and accessories furnished by the manufacturer of the open mesh cable tray product.

- C. The open mesh cable tray shall be installed above the equipment racks as defined on the construction drawings. The cable tray must be secured to the equipment racks. Components to secure the rack may be furnished by either the cable tray manufacturer or the equipment rack manufacturer.
- D. It shall be contractor's responsibility to inspect areas to receive the open mesh cable tray and notify the Owner / Owner's Representative of conditions that would adversely affect the installation or subsequent utilization of the system. These conditions shall be corrected prior to installation of the open mesh cable tray.
- E. The contract shall install and support the open mesh cable tray system in accordance with span load criteria of L/240.

3.9 FIRESTOP SYSTEM

- A. All fire stop systems shall be installed in accordance with the manufacturer's recommendations and shall be completely installed and available for inspection by the local inspection authorities before cable system acceptance.

3.10 GROUNDING SYSTEM

- A. The TBB shall adhere to the recommendations of the ANSI/TIA/EIA-607 standard, and shall be installed in accordance with best industry practice.
- B. A licensed electrical contractor shall perform installation and termination of the main bonding conductor to the building service entrance ground.

3.11 IDENTIFICATION AND LABELING

- A. Labeling shall be done as shown on construction drawings. At a minimum, the labeling system shall clearly identify all components of the system: racks, cables, panels and outlets. The labeling system shall designate the cables origin and destination and a unique identifier for the cable within the system. Racks and patch panels shall be labeled to identify the location within the cable system infrastructure. All labeling information shall be recorded on the red-lined as-built drawings and all test documents shall reflect the appropriate labeling scheme. Labeling shall follow the guidelines of ANSI/TIA/EIA-606-A.
- B. All label printing will be machine generated. Labels will be used on cable jackets, appropriately sized to the OD of the cable, and placed within view at the termination point on each end. Outlet, patch panel and wiring block labels shall be installed on, or in, the space provided on the device.

3.12 TESTING AND ACCEPTANCE

- A. General
 - 1. All cables and termination hardware shall be 100% tested for defects in installation and to verify cabling system performance under installed conditions according to the requirements of ANSI/TIA/EIA-568-B including all addendums. All pairs of each installed cable shall be verified prior to system acceptance. Any defect in the cabling system installation including but not limited to cable, connectors, feed through couplers, patch panels, and connector blocks shall be repaired or replaced in order to ensure 100% useable conductors in all cables installed at no cost to the Owner.
 - 2. All cables shall be tested in accordance with this document, the ANSI/TIA/EIA standards, and the Manufacturer's Certification Program Information Manual, BICSI and best industry practice. If any of these are in conflict, the Contractor shall bring any discrepancies to the attention of the Owner / Owner's Representative for clarification and resolution.

3. The Engineer may request that the T/C verify at random that the patch cords meet test requirements defined in ANSI/TIA/EIA-568-B.2.1.

B. Copper link Testing

1. All twisted-pair copper cable links shall be tested for continuity, pair reversals, shorts, opens and performance as indicated below. Additional testing is required to verify Category 6 performance. Horizontal cabling shall be tested using a Level III test unit for category 6-performance compliance as specified in ANSI/TIA/EIA-568-B.2-1.
2. Continuity - Each pair of each installed cable shall be tested using a test unit that shows opens, shorts, polarity and pair-reversals, crossed pairs and split pairs. Shielded/screened cables shall be tested with a device that verifies shield continuity in addition to the above stated tests. The test shall be recorded as pass/fail as indicated by the test unit in accordance with the manufacturers' recommended procedures, and referenced to the appropriate cable identification number and circuit or pair number. Any faults in the wiring shall be corrected and/or replaced and re-tested before final acceptance.
3. Length - Each installed cable link shall be tested for installed length using a Time Domain Reflectometer (TDR) type device. The cables shall be tested from end to end, patch panel to patch panel, block to block, patch panel to outlet or block to outlet as appropriate. The cable length shall conform to the maximum distances set forth in the ANSI/TIA/EIA-568-B Standard. Cable lengths shall be recorded, referencing the cable identification number and circuit or pair number. For multi-pair cables, the longest pair length shall be recorded as the length for the cable.

C. Category 6 Performance

1. Follow the Standards requirements established in:
 - a. ANSI/TIA/EIA-568-B .1, B.2-1
 - b. A Level III test unit is required to verify category 6 performances. The basic tests required are:
 - ◆ Wire Map
 - ◆ Length
 - ◆ Attenuation
 - ◆ NEXT (Near end crosstalk)
 - ◆ Return Loss
 - ◆ ELFEXT Loss
 - ◆ Propagation Delay
 - ◆ Delay skew
 - ◆ PSNEXT (Power sum near-end crosstalk loss)
 - ◆ PSELFEXT (Power sum equal level far-end crosstalk loss)
2. The Contractor shall test each link from end to end to ensure the performance of the system. A complete link test is required. The contractor will install patch cords to complete the circuit and then test the entire channel.

D. Fiber Testing

1. All fiber testing shall be performed on all fibers in the completed end-to-end system. There shall be no splices. Testing shall consist of an end-to-end power meter test performed per EIA/TIA-455-53A. The system loss measurements shall be provided at 850 and/or 1300 nanometers for multimode fibers from both directions. These tests also include continuity checking of each fiber.

2. Backbone multimode fiber cabling shall be tested at both 850 nm and 1300 nm (or 1310 and 1550 nm for singlemode) in both directions.
3. Test set-up and performance shall be conducted in accordance with ANSI/EIA/TIA-526-14 Standard, Method B.
4. Where links are combined to complete a circuit between devices, the Contractor shall test each link from end to end to ensure the performance of the system. **ONLY LINK TEST IS REQUIRED.** The contractor can optionally install patch cords to complete the circuit and then test the entire channel. The test method shall be the same used for the test described above. The values for calculating loss shall be those defined in the ANSI/TIA/EIA Standard.
5. Attenuation testing shall be performed with an approved hand held tester from an industry recognized test equipment manufacturer.

E. Coax Cable Testing

1. 100% of coax cables placed shall be tested. They shall be tested for continuity and length. The results shall be recorded and provided to the Engineer for review.

3.13 SYSTEM DOCUMENTATION

- A. Upon completion of the installation, the telecommunications contractor shall provide two (2) full documentation sets to the Owner / Owner's Representative for approval. Documentation shall include the items detailed in the sub-sections below.
- B. Documentation shall be submitted within ten (10) working days of the completion of each testing phase (e.g. subsystem, cable type, area, floor, etc.). This is inclusive of all test results and draft annotated drawings. Draft drawings may include annotations done by hand. Machine generated (final) copies of all drawings shall be submitted within 30 working days of the completion of each testing phase. The telecommunications contractor shall provide copies of the original test results to the Owner / Owner's Representative.
- C. The Owner / Owner's Representative may request that a 10% random field re-test be conducted on the cable system, at no additional cost, to verify documented findings. Tests shall be a repeat of those defined above. If findings contradict the documentation submitted by the telecommunications contractor, additional testing can be requested to the extent determined necessary by the Owner / Owner's Representative, including a 100% re-test. This re-test shall be at no additional cost to the Owner.

3.14 TEST RESULTS

- A. Test documentation shall be provided to the Owner / Owner's Representative within three weeks after the completion of the project. The telecommunications contractor shall provide one set of documentation, printed on paper and two copies on compact disk. The disk shall be clearly marked on the outside front cover with the words "Project Test Documentation", the project name, and the date of completion (month and year). The results shall include a record of test frequencies, cable type, conductor pair and cable (or outlet) I.D., measurement direction, reference setup, and crew member name(s). The test equipment name, manufacturer, model number, serial number, software version and last calibration date will also be provided at the end of the document. Unless the manufacturer specifies a more frequent calibration cycle, an annual calibration cycle is mandatory on all test equipment used for this installation. The test document shall detail the test method used and the specific settings of the equipment during the test as well as the software version being used in the field test equipment.

- B. The field test equipment shall meet the requirements of ANSI/TIA/EIA-568-B including applicable TSB's and amendments. The appropriate Level III tester shall be used to verify Category 6 cabling systems.
- C. Printouts generated for each cable by the (wire or fiber) test instrument shall be submitted as part of the documentation package. The telecommunications contractor must furnish this information in electronic form (CD-ROM) and print out on paper.
- D. When repairs and re-tests are performed, the problem found and corrective action taken shall be noted, and both the failed and passed test data shall be documented.

3.15 AS-BUILT DRAWINGS

- A. The drawings are to include cable routes and outlet locations. Outlet locations shall be identified by their sequential number as defined elsewhere in this document. Numbering, icons, and drawing conventions used shall be consistent throughout all documentation provided. The Owner will provide floor plans in paper and electronic (DWG, AutoCAD 2007) formats on which as-built construction information can be added. These documents will be modified accordingly by the telecommunications contractor to denote as-built information as defined above and returned to the Owner/Owner's Representative.
- B. The Contractors shall annotate the base drawings and return a hard copy (same plot size as originals) and compact disk (AutoCAD 2007) format.

END OF SECTION 271500