Hurricane Repairs & Renovation Project
Jefferson Parish Human Services Authority
JPHSA Proposal No. 23-002

1500 River Oaks Road West
Elmwood, LA 70123

Prepared by:
Annie P. Labruzzo, Architect LLC
Axis Engineering LLC – Structural Engineering
GVA Engineering LLC – Mechanical and Electrical Engineering

May 31, 2023
Project Directory

Owner: Jefferson Parish Human Services Authority
3616 S 1-10 Service Road W, Suite 200
Metairie, LA 70001
Tel: (504) 838-5344
Fax: (504) 838-5714
Owner Representative: Majied Harris, Director of Facility Asset & Risk Management Department

Architect: Annie P. Labruzzo, Architect LLC
P.O. Box 791301
New Orleans, LA 70179
Tel: (504) 408-0715
Mobile: (985) 517-6392
Project Architect: Annie P. Labruzzo, AIA NCARB

Structural Engineer: Axis Engineering LLC
3500 N. Causeway Blvd., Suite 200
Metairie, LA 70002
Tel: (504) 380-0800
Project Engineer: T.B.D.

M/E/P Engineer: GVA Engineering, LLC
2615 Edenborn Ave., Suite C
Metairie, LA 70002
Tel: (504) 780-9330
Fax: (504) 780-9419
Project Engineer: T.B.D.

End of Section
Jefferson Parish Human Services Authority
Hurricane Repairs and Renovation Project
1500 River Oaks Road West, Elmwood, LA 70123
JPHSA Proposal No. 23-002

00 07 00 Professional Seals

Project Name: Jefferson Parish Human Services Authority
Hurricane Repairs and Renovation Project
1500 River Oaks Road West
Elmwood, LA 70123
JPHSA Proposal No. 23-002

Architectural Specifications: The following specification Sections were prepared by me or under my direct personal supervision:

Division 0 General Project Requirements
00 10 00 Advertisement for Bids
00 30 00 Louisiana Uniform Public Work Bid Form
00 30 00.A Bid Bond Form
00 40 00 Bidding Requirements
00 50 00 Corporate Resolution
00 60 00 Public Works Bid Affidavit
00 70 00 Form of Performance Bond
00 80 00 Form of Labor and Materials Payment Bond

Division 1 General Requirements
01 11 00 Summary of the Work
01 26 00 Contract Modification Procedures
01 29 00 Payment Procedures
01 31 00 Project Management and Coordination
01 31 19 Project Meetings
01 31 30 Request for Information
01 32 00 Construction Progress Documentation
01 33 00 Submittal Procedures
01 33 10 Request for Electronic Data
01 42 00 References
01 45 00 Testing Laboratory Services
01 50 00 Temporary Facilities and Controls
01 60 00 Product Requirements
01 63 00 Product Substitution Procedures
01 63 10 Substitution Request Form
01 73 29 Cutting and Patching
01 74 23 Final Cleaning
01 77 80 Project Closeout and Closeout Submittals
01 83 00 Construction Procedures
01 92 00 Warranties and Bonds

Division 2 Existing Conditions
02 41 19 Selective Demolition

Division 5 Metals
05 12 13 Architecturally Exposed Structural Steel Framing

Division 6 Wood and Plastics
06 40 23 Interior Architectural Woodwork
06 46 00 Wood Trim

Division 7 Moisture and Thermal Protection
07 21 00 Thermal Insulation
07 52 13 Modified Bituminous Membrane Roofing: Walkway Pads
07 54 23 Thermoplastic Polyolefin (TPO) Membrane Roofing: Curb Flashing
07 62 00 Sheet Metal Flashing and Trim

End of Architectural
00 01 00 Table of Contents

Introductory Information
00 00 30 Project Directory
00 00 70 Professional Seals
00 01 00 Table of Contents

Division 0 General Project Requirements
00 10 00 Advertisement for Bids
00 30 00 Louisiana Uniform Public Work Bid Form
00 30 00.A Bid Bond Form
00 40 00 Bidding Requirements
00 50 00 Corporate Resolution
00 60 00 Public Works Bid Affidavit
00 70 00 Form of Performance Bond
00 80 00 Form of Labor and Materials Payment Bond
00 90 00 Terms and Conditions (JPHSA Construction Contract and Attachments)

Division 1 General Requirements
01 11 00 Summary of the Work
01 26 00 Contract Modification Procedures
01 29 00 Payment Procedures
01 31 00 Project Management and Coordination
01 31 19 Project Meetings
01 31 30 Request for Information
01 32 00 Construction Progress Documentation
01 33 00 Submittal Procedures
01 33 10 Request for Electronic Data
01 42 00 References
01 45 00 Testing Laboratory Services
01 50 00 Temporary Facilities and Controls
01 60 00 Product Requirements
01 63 00 Product Substitution Procedures
01 63 10 Substitution Request Form
01 73 29 Cutting and Patching
01 74 23 Final Cleaning
01 77 80 Project Closeout and Closeout Submittals
01 83 00 Construction Procedures
01 92 00 Warranties and Bonds

Division 2 Existing Conditions
02 41 19 Selective Demolition

Division 3 Concrete
03 30 00 Cast-In-Place Concrete

Division 4 Masonry (Not Used)

Division 5 Metals
05 12 00 Structural Steel
05 12 13 Architecturally Exposed Structural Steel Framing
Division 6  Wood and Plastics
06 10 00  Rough Carpentry
06 40 23  Interior Architectural Woodwork
06 46 00  Wood Trim

Division 7  Moisture and Thermal Protection
07 21 00  Thermal Insulation
07 52 13  Modified Bituminous Membrane Roofing: Walkway Pads
07 54 23  Thermoplastic Polyolefin (TPO) Membrane Roofing: Curb Flashing
07 62 00  Sheet Metal Flashing and Trim
07 84 43  Joint Firestopping
07 90 00  Joint Protections (Sealants)

Division 8  Openings
08 12 13  Hollow Metal Frames
08 14 16  Flush Wood Doors
08 56 59  Aluminum Interior Sliding Service Window
08 71 00  Door Hardware
08 80 00  Glazing

Division 9  Finishes
09 21 16  Gypsum Wallboard Assemblies
09 30 00  Tiling
09 51 13  Acoustical Ceiling System
09 65 16  Resilient Tile Flooring and Accessories
09 90 00  Painting and Coating

Division 10 Specialties
10 14 15  Interior Signage
10 21 13  Toilet Compartments
10 28 13  Commercial Toilet Accessories

Divisions 11 Equipment
11 33 00  Retractable Stairs

Divisions 12 Furnishings (Not Used)

Divisions 13 Special Construction (Not Used)

Division 14 Conveying Equipment (Not Used)

Division 20 Mechanical Support
20 00 00  Mechanical General Provisions

Division 21 Fire Suppression (Not Used)

Division 22 Plumbing
22 10 00  Plumbing Systems

Division 23 Heating, Ventilation, and Air Conditioning
23 05 00  Heating, Ventilation, and Air Conditioning
23 09 00  Heating, Ventilation, and Air Conditioning Control Systems

Division 25 Integration and Automation (Not Used)
Table of Contents

Divisions 26  Electrical
26 00 00  Electrical General Provisions
26 05 00  Electrical Basic Materials and Methods
26 20 00  Electrical Service and Distribution Systems
26 50 00  Electrical Lighting

Divisions 27  Communications
27 05 00  Communications Systems

Divisions 28  Fire Detection and Alarm System
28 31 00  Fire Alarm System

Division 29-30  (Not Used)

Divisions 31  Earthwork
31 62 00  Driven Piles

Divisions 32  Exterior Improvements
32 13 13  Cement Concrete Paving
32 17 23  Pavement Markings

Divisions 33  Utilities (Not Used)

Divisions 34-48  (Not Used)

End of Section
Sealed bids will be received until the hour of **2:00 P.M. CST on Wednesday, August 2, 2023**, at Jefferson Parish Human Services Authority (JPHSA), located at 3616 South I-10 Service Road West, Suite 200, Metairie, LA 70001, and publicly opened upon completion of administrative tasks for the following: **Elmwood Building Renovations at Jefferson Parish Human Services Authority, 1500 River Oaks Road West, Jefferson, LA 70123.**

The project work consists of interior renovations and equipment upgrades to an existing office building as described in the Construction Documents.

All bids must be in accordance with the contract documents on file with the Jefferson Parish Human Services Authority Administrative Office, 3616 South I-10 Service Road West, Suite 200, Metairie, LA 70001. All bidders must show the **Bid Proposal Number and Contractors License Number** on the outside of their bid envelope and on the bid proposal. **Late bids will not be accepted.**

Each Bid must be accompanied by certified check, cashier’s check, or bid bond acceptable to the owner in the amount equal to five percent (5%) of the total amount bid, and payable without condition to the owner as a guarantee that the bidder, if awarded the contract, will promptly execute a contract in accordance with his proposal and all terms and conditions of the contract documents.

The drawings and specifications are on file and open for inspection in the Jefferson Parish Human Services Authority Facilities Maintenance Office, 3616 South I-10 Service Road West, Suite 200, Metairie, LA 70001 (Phone 504-578-1560). Licensed General Contractors may secure a complete set of Contract Documents by contacting Annie P. Labruzzo, Architect LLC (Phone 985-517-6392) and by paying a deposit of **$150.00** per set to the Architect. Deposit on the first set of documents furnished to bona fide prime bidders will be fully refunded upon return of documents to Annie P. Labruzzo, Architect LLC in good condition no later than ten (10) days after JPHSA’s receipt of bids.

The successful bidder will be required to furnish a performance bond guaranteeing faithful performance of the contract. Companies providing the bonds shall comply with the requirements of LRS-R.S. 38:2218 and R.S. 38:2219 as applicable.

JPHSA reserves the right to accept or reject any or all proposals, in whole or in part, and waive informalities, pursuant to the law. This is an all or none bid.

A **Mandatory** Pre-Bid Conference will be held at **10:00 A.M. CST on Wednesday, July 19, 2023**, at Jefferson Parish Human Services Authority, located at 1500 River Oaks Road W, Jefferson, LA 70123. All interested parties are invited to attend.

Contractors arriving after **10:00 A.M. CST on Wednesday, July 19, 2023** will not be admitted into the **Mandatory** Pre-Bid Conference. Contractors who do not attend the **Mandatory** Pre-Bid Conference are not eligible to submit proposals.

**ADV: New Orleans Advocate:** June 29, July 6, July 13, 2023
**ADV: Baton Rouge Advocate:** June 29, July 6, July 13, 2023

**Official Bid Documents are available at Central Bidding. Electronic Bids are accepted at Central Bidding. Central Bidding can be accessed at [www.centralbidding.com](http://www.centralbidding.com). For questions related to the electronic bidding process, please call Central Bidding at 225-810-4814. Bid documents can also be located on the JPHSA website at [https://www.jphsa.org/rfp](https://www.jphsa.org/rfp).**
BID BOND
FOR
Jefferson Parish Human Services Authority Hurricane Repairs & Renovation Project
1500 River Oaks Road West, Elmwood, LA 70123

Date: ____________________

KNOW ALL MEN BY THESE PRESENTS:

That ______________________________________, as Principal, and ______________________________________, as Surety, are held and firmly bound unto the ______________________________________ (Obligee), in the full and just sum of five (5%) percent of the total amount of this bid, including all alternates, lawful money of the United States, for payment of which sum, well and truly be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally firmly by these presents.

Surety represents that it is listed on the current U. S. Department of the Treasury Financial Management Service list of approved bonding companies as approved for an amount equal to or greater that the amount for which it obligates itself in this instrument or that it is a Louisiana domiciled insurance company with at least an A - rating in the latest printing of the A. M. Best's Key Rating Guide. If surety qualifies by virtue of its Best's listing, the Bond amount may not exceed ten percent of policyholders' surplus as shown in the latest A. M. Best's Key Rating Guide.

Surety further represents that it is licensed to do business in the State of Louisiana and that this Bond is signed by surety's agent or attorney-in-fact. This Bid Bond is accompanied by appropriate power of attorney.

THE CONDITION OF THIS OBLIGATION IS SUCH that, whereas said Principal is herewith submitting its proposal to the Obligee on a Contract for:

NOW, THEREFORE, if the said Contract be awarded to the Principal and the Principal shall, within such time as may be specified, enter into the Contract in writing and give a good and sufficient bond to secure the performance of the terms and conditions of the Contract with surety acceptable to the Obligee, then this obligation shall be void; otherwise this obligation shall become due and payable.

PRINCIPAL (BIDDER) ____________________

SURETY ____________________

BY: ______________________________________
AUTHORIZED OFFICER-OWNER-PARTNER

BY: ______________________________________
AGENT OR ATTORNEY-IN-FACT(SEAL)
TO: Jefferson Parish Human Services Authority  
3616 S. I-10 Service Rd.  
Metairie, LA 70001  

BID FOR: Jefferson Parish Human Services Authority  
Hurricane Repairs and Renovation Project  
1500 River Oaks Road West  
Elmwood, LA 70123  

The undersigned bidder hereby declares and represents that she/he: a) has carefully examined and understands the Bidding Documents, b) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services for the construction and completion of the referenced project, all in strict accordance with the Bidding Documents prepared by: Annie P. Labrizzo, Architect LLC  
and dated: May 31, 2023  

Bidders must acknowledge all addenda. The Bidder acknowledges receipt of the following ADDENDA: (Enter the number the Designer has assigned to each of the addenda that the Bidder is acknowledging)  

TOTAL BASE BID: For all work required by the Bidding Documents (including any and all unit prices designated “Base Bid” * but not alternates) the sum of:  

Dollars ($ )  

ALTERNATES: For any and all work required by the Bidding Documents for Alternates including any and all unit prices designated as alternates in the unit price description.  

Alternate No. 1 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:  

Dollars ($ )  

Alternate No. 2 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:  

Dollars ($ )  

Alternate No. 3 (Owner to provide description of alternate and state whether add or deduct) for the lump sum of:  

Dollars ($ )  

NAME OF BIDDER:  

ADDRESS OF BIDDER:  

LOUISIANA CONTRACTOR’S LICENSE NUMBER:  

NAME OF AUTHORIZED SIGNATORY OF BIDDER:  

TITLE OF AUTHORIZED SIGNATORY OF BIDDER:  

SIGNATURE OF AUTHORIZED SIGNATORY OF BIDDER **:  

DATE:  

THE FOLLOWING ITEMS ARE TO BE INCLUDED WITH THE SUBMISSION OF THIS LOUISIANA UNIFORM PUBLIC WORK BID FORM:  

* The Unit Price Form shall be used if the contract includes unit prices. Otherwise it is not required and need not be included with the form. The number of unit prices that may be included is not limited and additional sheets may be included if needed.  

** A CORPORATE RESOLUTION OR WRITTEN EVIDENCE of the authority of the person signing the bid for the public work as prescribed by LA R.S. 38:2212(B)(5).  

BID SECURITY in the form of a bid bond, certified check or cashier’s check as prescribed by LA R.S. 38:2218(A) attached to and made a part of this bid.
UNIT PRICES: This form shall be used for any and all work required by the Bidding Documents and described as unit prices. Amounts shall be stated in figures and only in figures.

<table>
<thead>
<tr>
<th>DESCRIPTION:</th>
<th>Base Bid or Alt.# ___</th>
<th>REF. NO.</th>
<th>QUANTITY:</th>
<th>UNIT OF MEASURE:</th>
<th>UNIT PRICE</th>
<th>UNIT PRICE EXTENSION</th>
<th>(Quantity times Unit Price)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DESCRIPTION:</td>
<td>Base Bid or Alt.# ___</td>
<td>REF. NO.</td>
<td>QUANTITY:</td>
<td>UNIT OF MEASURE:</td>
<td>UNIT PRICE</td>
<td>UNIT PRICE EXTENSION</td>
<td>(Quantity times Unit Price)</td>
</tr>
<tr>
<td>DESCRIPTION:</td>
<td>Base Bid or Alt.# ___</td>
<td>REF. NO.</td>
<td>QUANTITY:</td>
<td>UNIT OF MEASURE:</td>
<td>UNIT PRICE</td>
<td>UNIT PRICE EXTENSION</td>
<td>(Quantity times Unit Price)</td>
</tr>
<tr>
<td>DESCRIPTION:</td>
<td>Base Bid or Alt.# ___</td>
<td>REF. NO.</td>
<td>QUANTITY:</td>
<td>UNIT OF MEASURE:</td>
<td>UNIT PRICE</td>
<td>UNIT PRICE EXTENSION</td>
<td>(Quantity times Unit Price)</td>
</tr>
<tr>
<td>DESCRIPTION:</td>
<td>Base Bid or Alt.# ___</td>
<td>REF. NO.</td>
<td>QUANTITY:</td>
<td>UNIT OF MEASURE:</td>
<td>UNIT PRICE</td>
<td>UNIT PRICE EXTENSION</td>
<td>(Quantity times Unit Price)</td>
</tr>
<tr>
<td>DESCRIPTION:</td>
<td>Base Bid or Alt.# ___</td>
<td>REF. NO.</td>
<td>QUANTITY:</td>
<td>UNIT OF MEASURE:</td>
<td>UNIT PRICE</td>
<td>UNIT PRICE EXTENSION</td>
<td>(Quantity times Unit Price)</td>
</tr>
</tbody>
</table>

Wording for “DESCRIPTION” is to be provided by the Owner.
All quantities are estimated. The contractor will be paid based upon actual quantities as verified by the Owner.
Bidding Requirements

PROJECT:  Jefferson Parish Human Services Authority
Hurricane Repairs and Renovation Project
1500 River Oaks Road West
Elmwood, LA 70123

A. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with
OWNER in the form included in the Contract Documents to perform and furnish all Work as specified
or indicated in the Contract Documents for the bid Price and within the Bid Times indicated in this Bid
and in accordance with the other terms and conditions of the Contract Documents.

B. BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and
Instructions to Bidders, including without limitation those dealing with the disposition of Bidders. This
bid will remain subject to acceptance for forty-five (45) days after the day of Bid opening. BIDDER will
sign and deliver the required number of counterparts of the Agreement with the Bonds and other
documents required by the Bidding Requirements within ten (10) days after the date received from
Architect.

C. COMPLETION TIME: The undersigned Bidder hereby proposes to furnish and provide all materials,
equipment, labor and other incidental items which may be required to fully perform and complete
the work for which prices are stated in the Bid, in full conformity with said Drawings, Specifications,
and Contract Documents of which this Bid is a part, for the prices herein stated and further proposes
and agrees, if this Bid is accepted, to prosecute said work with an adequate force and ample
equipment to assure completion of the entire work within one hundred eighty (180) calendar days
and two hundred ten (210) calendar days to achieve Substantial Completion and Final Acceptance
from date of NOTICE TO PROCEED.

D. In submitting this Bid, BIDDER hereby declares and represents that she/he, a) has carefully examined
and understands the Bidding Documents, b) has not received, relied on, or based his bid on any
verbal instructions contrary to the Bidding Documents or any addenda, c) has personally inspected
and is familiar with the project site, and hereby proposes to provide all labor, materials, tools,
appliances and facilities as required to perform, in a workmanlike manner, all work and services for
the construction and completion of the referenced project, all in strict accordance with the Bidding
Documents.

E. BIDDER has become familiar with and is satisfied as to the general, local and site conditions that may
affect cost, progress, performance and furnishing of the Work.

F. BIDDER is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may
affect cost, progress, performance and furnishing of the Work.

G. BIDDER has carefully studied all reports of explorations and tests of subsurface conditions at or
contiguous to the site and all drawings of physical conditions in or relating to existing surface or
subsurface structures at or contiguous to the site (except Underground Facilities). BIDDER
acknowledges that such reports and drawings are not Contract Documents and may not be complete
for BIDDER’s purposes. BIDDER acknowledges that OWNER and Design Professional do not assume
responsibility for the accuracy or completeness of information and data shown or indicated in the
Bidding Documents with respect to Underground Facilities at or contiguous to the site. BIDDER has
obtained and carefully studied (or assumes responsibility for having done so) all such additional or

Bidding Requirements 00 40 00-1
supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect costs progress, performance or furnishing of the Work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by BIDDER and safety precautions and programs incident thereto. BIDDER does not consider that any additional examinations, investigations, explorations, tests, studies or data are necessary for the determination of this Bid for performance and furnishing of the Work in accordance with the times, price and other terms and conditions of the Contract Documents.

H. BIDDER is aware of the general nature of Work to be performed by OWNER and others at the site that relates to Work for which this Bid is submitted as indicated in the Contract Documents.

I. BIDDER has correlated in the information known to BIDDER, Information and observations obtained form visits to the site, reports and drawings identified in the Contract Documents and all additional examinations, investigations, explorations, tests, studies and data with the Contract Documents.

J. BIDDER has given ARCHITECT written notice of all conflicts, errors, Ambiguities or discrepancies that BIDDER has discovered in the Contract Documents and the written resolution thereof by ARCHITECT is acceptable to BIDDER, and the Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work for which this Bid is submitted.

K. This Bid is genuine and not made in the interest of or on behalf of any Undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.

L. BASIS OF AWARD: The basis of award of the Contract will be in accordance with Louisiana Law R.S. 38:2212. The Owner, upon receipt of bids, shall act to issue a letter of award to the lowest responsible BIDDER within 45 days from the date of the bid opening or reject all bids. This deadline may be extended by one or more extensions of 30 days each up to a maximum of one hundred twenty (120) days with the mutual written consent of Owner and the low BIDDER without increase in the bid amount as per LA-RS 38:2215.

M. LIQUIDATED DAMAGES: In accordance with Resolutions 113646 and 113647, BIDDER agrees that if entire work, or any designated portion thereof as outlined in phasing plans, is not substantially completed within the Contract Time as extended by approved Change Orders, the Owner may deduct from the Contract Sum of Five hundred dollars ($500.00) per calendar day as liquidated damages until the work is completed.

In addition to, but not in lieu of the per diem liquidated damages, Owner shall also be entitled to recover from Contractor or Contractor's Surety additional liquidated damages as detailed in Resolutions 113646 and 113647. These additional liquidated damages may include, but are not limited to the following: (1) Extended architectural and/or engineering fees; (2) Extended Resident Project Representative fees; (3) Extended construction management fees; (4) Extended Owner's overhead and personnel expenses; and (5) Owner's other costs directly related to the delay in completion beyond the Contract Times.
N. If Contractor/Bidder fails to complete all punch list items within 30 days from the date that the project is certified as substantially complete, the Owner may deduct from the remaining contract balances the sum of **Five hundred dollars ($500.00) per calendar day** as liquidated damages for each calendar day thereafter until all punch list items are complete.

O. **METHODS OF BID SUBMISSION:**

1. Electronic Bids are accepted at Central Bidding. Central Bidding can be accessed at www.centralbidding.com. For questions related to the electronic bidding process, please call Central Bidding at 225-810-4814.
2. Jefferson Parish Human Services Authority, located at 366 South I-10 Service Road West, Suite 200, Metairie, LA 70001. Office Hours: Monday - Friday, 8:00 AM - 4:30 PM.

End of Document
CORPORATE RESOLUTION

EXEMPLARY FROM MINUTES OF MEETING OF THE BOARD OF DIRECTORS OF
INCORPORATED.

AT THE MEETING OF DIRECTORS OF _________________________________________
INCORPORATED, DULY NOTICED AND HELD ON ________________________, A QUORUM
BEING THERE PRESENT, ON MOTION DULY MADE AND SECONDED. IT WAS:

RESOLVED THAT _________________________________________, BE AND IS HEREBY
APPOINTED, CONSTITUTED AND DESIGNATED AS AGENT AND ATTORNEY-IN-
FACT OF THE CORPORATION WITH FULL POWER AND AUTHORITY TO ACT ON
BEHALF OF THIS CORPORATION IN ALL NEGOTIATIONS, BIDDING, CONCERNS
AND TRANSACTIONS WITH THE PARISH OF JEFFERSON OR ANY OF ITS AGENCIES,
DEPARTMENTS, EMPLOYEES OR AGENTS, INCLUDING BUT NOT LIMITED TO, THE
EXECUTION OF ALL BIDS, PAPERS, DOCUMENTS, AFFIDAVITS, BONDS, SURETIES,
CONTRACTS AND ACTS AND TO RECEIVE ALL PURCHASE ORDERS AND NOTICES
ISSUED PURSUANT TO THE PROVISIONS OF ANY SUCH BID OR CONTRACT, THIS
CORPORATION HEREBY RATIFYING, APPROVING, CONFIRMING, AND ACCEPTING
EACH AND EVERY SUCH ACT PERFORMED BY SAID AGENT AND ATTORNEY-IN-
FACT.

I HEREBY CERTIFY THE FOREGOING TO BE A TRUE AND CORRECT COPY OF AN
EXEMPLARY OF THE MINUTES OF THE ABOVE DATED MEETING OF THE BOARD OF
DIRECTORS OF SAID CORPORATION, AND THE SAME HAS NOT BEEN REVOKED OR
RESCINDED.

SECRETARY-TREASURER

DATE

Revised 7/14/2014
Affidavit Instructions

• Affidavit is supplied as a courtesy to Affiants, but it is the responsibility of the affiant to insure the affidavit they submit to Jefferson Parish complies, in both form and content, with federal, state and parish laws.

• Affidavit must be signed by an authorized representative of the entity or the affidavit will not be accepted.

• Affidavit must be notarized or the affidavit will not be accepted.

• Notary must sign name, print name, and include bar/notary number, or the affidavit will not be accepted.

• Affiant MUST select either A or B when required or the affidavit will not be accepted.

• Affiants who select choice A must include an attachment or the affidavit will not be accepted.

• If both choice A and B are selected, the affidavit will not be accepted.

• Affidavit marked N/A will not be accepted.

• It is the responsibility of the Affiant to submit a new affidavit if any additional campaign contributions are made after the affidavit is executed but prior to the time the council acts on the matter.

Instruction sheet may be omitted when submitting the affidavit
Public Works Bid

AFFIDAVIT

STATE OF _________________

PARISH/COUNTY OF _________________

BEFORE ME, the undersigned authority, personally came and appeared: ______________
___________________________, (Affiant) who after being by me duly sworn, deposed and said that
he/she is the fully authorized _________________________ of ___________________ (Entity),
the party who submitted a bid in response to Bid Number ____________, to the Parish of
Jefferson.

Affiant further said:

Campaign Contribution Disclosures

(Choose A or B, if option A is indicated please include the required attachment):

Choice A ______ Attached hereto is a list of all campaign contributions, including
the date and amount of each contribution, made to current or
former elected officials of the Parish of Jefferson by Entity,
Affiant, and/or officers, directors and owners, including
employees, owning 25% or more of the Entity during the two-year
period immediately preceding the date of this affidavit or the
current term of the elected official, whichever is greater. Further,
Entity, Affiant, and/or Entity Owners have not made any
contributions to or in support of current or former members of the
Jefferson Parish Council or the Jefferson Parish President through
or in the name of another person or legal entity, either directly or
indirectly.

Choice B ______ there are NO campaign contributions made which would require
disclosure under Choice A of this section.
Affiant further said:

Debt Disclosures
(Choose A or B, if option A is indicated please include the required attachment):

**Choice A**

Attached hereto is a list of all debts owed by the affiant to any elected or appointed official of the Parish of Jefferson, and any and all debts owed by any elected or appointed official of the parish to the Affiant.

**Choice B**

There are **NO** debts which would require disclosure under Choice A of this section.

Affiant further said:

That Affiant has employed no person, corporation, firm, association, or other organization, either directly or indirectly, to secure the public contract under which he received payment, other than persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project or in securing the public contract were in the regular course of their duties for Affiant; and

That no part of the contract price received by Affiant was paid or will be paid to any person, corporation, firm, association, or other organization for soliciting the contract, other than the payment of their normal compensation to persons regularly employed by the Affiant whose services in connection with the construction, alteration or demolition of the public building or project were in the regular course of their duties for Affiant.

Affiant further said:

Affiant personally has not been convicted of, nor has he/she entered into a plea of guilty or nolo contendere to any of the crimes or equivalent federal crimes listed below. No individual partner, incorporator, director, manager, officer, organizer, or member, who has a minimum of a ten percent ownership in the Bidding Entity, has been convicted of, or has entered a plea of guilty or nolo contendere to any of the crimes or equivalent federal crimes listed below. A conviction of or plea of guilty or nolo contendere to the following state crimes or equivalent federal crimes shall permanently bar any person or the bidding entity from bidding on public projects:

(a) Public bribery (R.S. 14:118)
(b) Corrupt influencing (R.S. 14:120)
(c) Extortion (R.S. 14:66)
(d) Money laundering (R.S. 14:230)
A conviction of or plea of guilty or nolo contendere to the following state crimes or equivalent federal crimes shall bar any person or the bidding entity from bidding on public projects for a period of five years from the date of conviction or from the date of the entrance of the plea of guilty or nolo contendere:

(a) Theft (R.S. 14:67)
(b) Identity Theft (R.S. 14:67, 16)
(c) Theft of a business record (R.S. 14:67.20)
(d) False accounting (R.S. 14:70)
(e) Issuing worthless checks (R.S. 14:71)
(f) Bank fraud (R.S. 14:71.1)
(g) Forgery (R.S. 14:72)
(h) Contractors; misapplication of payments (R.S. 14:202)
(i) Malfeasance in office (R.S. 14:134)

The five-year prohibition provided for in this section shall apply only if the crime was committed during the solicitation or execution of a contract or bid awarded pursuant to these provisions. If evidence is submitted substantiating that a false attestation has been made and the project must be readvertised or the contract cancelled, the awarded entity making the false attestation shall be responsible to the public entity for the costs of rebidding, additional costs due to increased costs of bids and any and all delay costs due to the rebid or cancellation of this project.

[The remainder of this page is intentionally left blank.]
Affiant further said:

(1) Entity is registered and participates in a status verification system to verify that all employees in the State of Louisiana are legal citizens of the United States or are legal aliens.

(2) Entity shall continue, during the term of the contract, to utilize a status verification system to verify the legal status of all new employees in the State of Louisiana.

(3) Entity shall require all subcontractors to submit to the Entity a sworn affidavit verifying compliance with statements (1) and (2).

____________________________________
Signature of Affiant

____________________________________
Printed Name of Affiant

SWORN AND SUBSCRIBED TO BEFORE ME
ON THE _______ DAY OF ___________, 20___.

____________________________________
Notary Public

____________________________________
Printed Name of Notary

____________________________________
Notary/Bar Roll Number

My commission expires ________________.
KNOW ALL MEN BY THESE PRESENTS:

That we, ____________________________________, a _____________________________,
(Name of Contractor)
hereinafter called “Principal”, and ____________________________________________, State
(Surety)
of ________________________, hereinafter called the “Surety”, are held and firmly bound unto
______________________________________, of ___________________________________,
(Owner)       (City and State)

hereinafter called “Owner”, in the penal sum of ____________________________________
Dollars ($                             ) in lawful money of the United States, for the payment of which sum
well and truly to be made, we bind ourselves, our heirs, executors, administrators, and
successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered
into a certain contract with the Owner, dated the ________________ day of _______________,
20__, a copy of which is hereto attached and made a part hereof for the construction of:

JEFFERSON PARISH HUMAN SERVICES AUTHORITY
ELMWOOD BUILDING RENOVATIONS
1500 RIVER OAKS ROAD WEST
ELMWOOD, LA 70123

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all
the undertakings, covenants, terms, conditions, and agreements of said contract during the
original term thereof, and any extensions thereof which may be granted by the Owner, with or
without notice to the Surety, and if he shall satisfy all claims and demands incurred under such
contract, and shall fully indemnify and save harmless the Owner from all costs and damages
which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all
FORM OF PERFORMANCE BOND (continued)

outlay and expense which the Owner may incur in making good any default in connection with the construction of such work, and all insurance premiums on said work, whether by sub-contractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

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

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

IN WITNESS WHEREOF, this instrument is executed in __________counterparts, each one of which shall be deemed an original, this the ________day of _______________, 20___.

WITNESSES:

________________________________
(Principal)

________________________________

________________________________
Title:________________________________

________________________________
(Surety)

________________________________
By:________________________________
(Attorney-in-fact)

________________________________
(Address)

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is Partnership, all partners should execute bond.
FORM OF LABOR AND MATERIALS PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT:

that

______________________________________________________________

(Name of Contractor)

______________________________________________________________

(Address of Contractor)

a _hereinafter called Principal,

and __________________________________________________________

(Name of Surety)

______________________________________________________________

(Address of Surety)

hereinafter called Surety, all held and firmly bound unto the Parish of Jefferson hereinafter called Owner, in the penal sum of __________________________________________________________ Dollar ($ __________________ ) in lawful money of the United States, for the payment of which sum well and truly be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the _____day of ______________, 20__, a copy of which is hereto attached and made a part hereof for the construction of:

   JOSEPH S. YENNI BUILDING
   NEW FLAGPOLES
   1221 ELMWOOD PARK BLVD.,
   JEFFERSON, LA 70123

   JEFFERSON PARISH HUMAN SERVICES AUTHORITY
   WESTBANK RENOVATIONS
   5001 WESTBANK EXPRESSWAY, STE. 200
   MARRERO, LA 70772

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.
FORM OF LABOR AND MATERIALS PAYMENT BOND (Continued)

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

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

IN WITNESS WHEREOF, this instrument is executed in _____counterparts, each of which shall be deemed an original, this ____day of ________________, 20__. 

ATTEST:

______________________________
Principal

BY:_____________________________

ADDRESS:______________________
(SEAL)

______________________________
Witness as to Principal

______________________________
Address

ATTEST:

______________________________
Surety

BY:_____________________________

ADDRESS:______________________
(SEAL)

______________________________
Address

NOTE: DATE OF BOND must not be prior to date of Contract:
1. Correct Name of Contractor
2. A Corporation, A Partnership, or an Individual
3. Correct Name of Surety

LM-2
## CONTRACT BETWEEN
JEFFERSON PARISH HUMAN SERVICES AUTHORITY

AND

FOR
Professional Services

1) Contractor (Legal Name if Corporation)  
2) Street Address  
3) Telephone Number  
4) Mailing Address (if different)  
5) Federal Employer Tax ID# or Social Security #  
6) Parish(es) Served  
7) License or Certification #  
8) Contractor Status
   Subrecipient: [ ] Yes [ ] No  
   Non-profit/Govt: [ ] Yes [ ] No  
   For Profit: [ ] Yes [ ] No  
8a) CFDA#  

9) Brief Description Of Services To Be Provided:  
   Include description of work to be performed and objectives to be met; description of reports or other deliverables and dates to be received (when applicable).

10) Effective Date  
11) Termination Date  

12) Maximum Contract Amount $  

13) Terms of Payment  
   If Contractor’s progress toward and/or completion of service delivery is to the satisfaction of JPHSA, JPHSA will make payments as follows: (stipulate rate or standard of payment, billing intervals, i.e. monthly/bi-monthly, invoicing provisions, etc.).

14) Special or Additional Provisions which are incorporated herein, if any (IF NECESSARY, ATTACH SEPARATE SHEET AND REFERENCE):  
   JPHSA/JeffCare Terms and Conditions for Providers of Professional Services  
   ATTACHMENT A – Monitoring Plan (If Applicable)  
   ATTACHMENT B – W-9 Form (If Applicable)  
   ATTACHMENT C – Statement of Work (If Applicable)  
   ATTACHMENT D – License and/or Resume (If Applicable)  
   ATTACHMENT E – Board Resolution (If Applicable)  
   ATTACHMENT F – Standard Provisions for Construction Contracts  
   ATTACHMENT G – Conflict of Interest Disclosure Form

---

PAYMENT WILL BE MADE ONLY UPON APPROVAL OF:  
Name: Christy Dempster  
Title: Chief Financial Officer  
Phone Number: 504-838-5427
Jefferson Parish Human Services Authority
Terms and Conditions for Providers of Professional Services

This document establishes the general terms and conditions for Jefferson Parish Human Services Authority and its programs, including JeffCare (hereinafter “JPHSA”). Contractor hereby agrees to the following:

1. Contractor hereby agrees to adhere as applicable to the mandates dictated by Titles VI and VII of the Civil Rights Act of 1964, as amended; the Vietnam Era Veterans’ Readjustment Assistance Act of 1974; Americans with Disabilities Act of 1990 as amended; Sec. 503 of the Rehabilitation Act of 1973; Sec. 202 of Executive Order 11246 as amended, and all applicable requirements imposed by or pursuant to the regulations of the U. S. Department of Health and Human Services. Contractor agrees not to discriminate in the rendering of services to and/or employment of individuals because of race, color, religion, sex, age, national origin, handicap, political beliefs, disability, veteran status, sexual orientation, gender identity, or any other non-merit factor.

2. Contractor shall abide by all applicable laws and regulations concerning confidentiality which safeguard private and/or protected information and the confidentiality of individuals served, including but not limited to the Health Insurance Portability and Accountability Act (HIPAA) and 42 CFR Part 2 (“the Privacy Rule”). Contractor shall not use or disclose any confidential or private/protected information pertaining to JPHSA, its staff members, affiliates, or the individuals it serves in any manner except as necessary for the proper fulfillment of Contractor’s obligations under this contract.


4. Contractor shall not engage in activities that are fraudulent, wasteful, and/or abusive with regard to JPHSA or healthcare resources. Contractor agrees to immediately report suspected healthcare fraud, waste, and/or abuse to the JPHSA Compliance Officer in accordance with JPHSA policy and the JPHSA Compliance Program.

5. The Federal Government, State Legislative Auditor, Louisiana Department of Health, and/or other entities entitled by law or contract, or designated by JPHSA, shall have the option of auditing all records pertaining to this contract during its term and for a six (6) year period following final payment. Contractor grants to JPHSA and/or other such designated body the right to inspect and review all of Contractor’s books and records pertaining to services rendered under this contract, and further agrees to guidelines for fiscal administration as may be promulgated by JPHSA. Contractor shall make records available during normal working hours.

6. Contractor shall comply with Federal and State laws and/or JPHSA policy requiring audits of Contractor’s operation as a whole or of specific program activities. When Contractor’s operations, accounts, or programs funded or described by this contract are the subject of an audit, Contractor shall send audit reports to JPHSA within thirty (30) days after the completion of the audit, but no later than six (6) months after the end of the audit period.

7. Contractor agrees to retain all books, records and other documents relevant to the contract and funds expended thereunder for at least six (6) years after final payment or as prescribed in 45 CFR 75:361; for whichever period is longer. Contractor shall make available to JPHSA such records within thirty (30) days of JPHSA’s written request and shall deliver such records to JPHSA’s office, without expense to JPHSA. The Contractor shall allow JPHSA to inspect, audit or copy records, without expense to JPHSA.

8. Contractor shall not assign any interest in this contract, nor transfer any interest in the same (whether by assignment or novation), without the express prior written consent of JPHSA, provided, however, that claims for money due or to become due to Contractor from JPHSA under this contract may be assigned to a bank, trust company or other financial institution without advanced approval. Contractor agrees to promptly furnish notice of any such assignment or transfer to JPHSA.

9. Contractor agrees that the responsibility for payment of taxes from the funds received under this contract shall be Contractor’s. Contractor assumes responsibility for providing services hereunder and shall make all deductions for social security and withholding taxes, as well as contributions for unemployment compensation funds.
10. Contractor shall obtain and maintain during the contract term all necessary insurance including automobile insurance, workers’ compensation insurance, and general liability insurance in amounts sufficient to protect Contractor and JPHSA from all claims related to Contractor’s performance under this contract. Said policies shall not be canceled, changed, or permitted to expire without thirty (30) days’ advanced written notice to JPHSA. Commercial General Liability Insurance shall provide protection during the performance of work under the contract from claims or damages for personal injury, including accidental death, as well as claims for property damages, with combined single limits prescribed by JPHSA. JPHSA, its JeffCare program, and/or Jefferson Parish shall be added as additional insureds on Contractor’s insurance certificate(s) upon request by JPHSA.

11. Contractor agrees that all costs incurred for travel and related expenses in connection with this contract must be pre-approved in writing by JPHSA, and must comply with JPHSA’s Travel policy. The contract contains a maximum contract amount, as specified on the first page of this contract, which is inclusive of all JPHSA obligations in connection which this contract, including fees and travel expenses.

12. Contractor agrees to comply with all JPHSA policies and procedures regarding prohibitions on expenditure of grant funds. Prohibitions under this provision include, but are not limited to, the prohibitions contained within the Consolidated Appropriations Act, 2021, and Title X of the Public Health Service Act, 42 U.S.C., 300, et seq.

13. Contractor agrees to comply with all other JPHSA policies and procedures, including JPHSA’s Compliance Program, as applicable to the scope of services provided by Contractor.

14. If Contractor is an individual providing direct medical or clinical services to JPHSA service recipients under this contract or otherwise working on-site at a JPHSA facility, Contractor agrees to personally submit to a criminal background check upon execution of the contract and to release the results to JPHSA.

15. If Contractor is an entity who employs or subcontracts with individuals to provide direct medical or clinical services to JPHSA service recipients under this contract or to otherwise work on-site at a JPHSA facility, Contractor shall supply JPHSA with criminal background check results for all such individuals at the time of contract execution.

16. Contractor warrants and asserts that it has no personal or professional relationships which may, resulting from the execution of this contract, give rise to an actual or apparent conflict of interest as that term is defined in Louisiana law. Contractor must make a written disclosure of any potential conflicts of interest by completing a Conflict of Interest Declaration form, attached to and made part of this contract. In the event a suspected conflict of interest is discovered or disclosed after the execution of the contract, JPHSA may terminate the contract immediately upon written notice to Contractor for cause.

17. As provided in LA R.S. 43:31(D), no funds provided herein shall be used to urge any elector to vote for or against any candidate or proposition on an election ballot, nor shall such funds be used to lobby for or against any proposition or matter having the effect of law being considered by any legislative body or any local governing authority. This provision shall not prevent the normal dissemination of factual information relative to a proposition or matter having the effect of law being considered by a legislative body or local governing authority. Contracts with individuals shall be exempt from this provision.

18. Should Contractor become employed within the classified or unclassified service of the State of Louisiana, and/or of JPHSA, during the effective period of the contract, Contractor must notify the Appointing Authority of any existing contract with JPHSA and notify JPHSA of the employment.

19. All non-third party software and source code, records, documents and other material delivered or transmitted to Contractor by JPHSA shall remain the property of JPHSA, and shall be returned by Contractor to JPHSA, at Contractor’s expense, at termination or expiration of this contract. All non-third party software and source code, records, reports, documents, or other material related to this contract and/or obtained or prepared by Contractor in connection with this contract shall become the property of JPHSA, and shall be returned by Contractor to JPHSA, at Contractors expense, at termination or expiration of this contract.

20. Contractor shall not enter into any subcontract for work or services contemplated under this contract without obtaining express prior written approval of JPHSA (which approval shall be attached to the original contract). Any subcontracts approved by JPHSA shall be subject to conditions and provisions as JPHSA may deem necessary; provided, however, that notwithstanding the foregoing, unless otherwise provided in this contract, such prior written approval shall not be required for the purchase by the contractor of supplies and services which are incidental but necessary for the performance of the work required under this contract. No subcontract shall relieve the Contractor of the responsibility for the
performance of the contractual obligations described herein.

21. Contractor acknowledges that the Louisiana Code of Governmental Ethics (R.S. 42:1101 et. seq) applies to the parties included herein. Contractor agrees to notify JPHSA immediately if potential violations of the Code of Governmental Ethics arise at any time during the term of this contract.

22. JPHSA shall not pay or reimburse Contractor for services furnished or costs incurred, which are not expressly provided for in this contract. In the event JPHSA determines a payment or reimbursement was made in error, JPHSA shall have the right to offset and withhold the amount of the overpayment from any amounts then due to Contractor under this contract, or to receive reimbursement from Contractor.

23. Contractor is obligated to invoice JPHSA by the tenth (10th) day of each month for services performed during the previous month. Contractor invoices JPHSA no more than once every 30 days unless otherwise agreed upon in writing. Contractor shall receive payment from JPHSA within 30 days of receipt of a proper invoice by Finance Operations. Contractor shall be responsible for the correct and timely submission of invoices.

24. Contractor understands that JPHSA and its programs operate on a fiscal year and that the fiscal year ends on the thirtieth (30th) day of June each year. In light of this, Contractor agrees to provide JPHSA with all outstanding invoices by the tenth (10th) day of July each year, regardless of whether the invoices would otherwise then be due. Contractor further agrees that any invoices not provided to JPHSA by the tenth (10th) day of July shall be deemed null and that JPHSA shall not be obligated to provide any payment for any invoice received after that date.

25. The term of this contract is stated on the first page. This contract may be terminated by either party for convenience upon thirty (30) days’ advance written notice to the other party, but in no case shall continue beyond the specified termination date. This contract may additionally be terminated by JPHSA immediately upon written notice to contractor for cause.

26. This contract is subject to and conditioned upon the availability of funding, and no liability or obligation for payment will develop between the parties until the contract has been executed by JPHSA. JPHSA may terminate the contract, or reduce the maximum contact amount, immediately upon written notice to Provider/Contractor when funding becomes unavailable, as determined by JPHSA. Such a termination or reduction in contract amount is considered “for cause.”

27. Any alteration, variation, modification, or waiver of provisions of this contract shall be valid only when reduced to writing, as an amendment duly signed, and approved by both parties. It is the responsibility of Contractor to advise JPHSA in advance if contract funds or contract terms may be insufficient to complete contract objectives. Budget revisions in cost reimbursement contracts do not require an amendment if the revision only involves the realignment of monies between originally approved cost categories.

28. Any contract disputes will be interpreted under applicable Louisiana laws without reference to its choice of law principles. Before any party to this contract may bring suit in any court concerning any issue relating to this contract, such party must first seek in good faith to resolve the issue through negotiation or other forms of non-binding alternative dispute resolution mutually acceptable to the parties. The parties irrevocably consent to the exclusive jurisdiction of the Louisiana 24th Judicial District Court or United States District Court for the Eastern District of Louisiana for any disputes related to this contract and hereby waive any objections based on inconvenient forum or improper venue.

29. Contractor warrants all materials, products, and/or services provided hereunder will not infringe upon or violate any patent, copyright, trade secret, or other proprietary right of any third party. In the event of any claim by any third party against JPHSA, JPHSA shall promptly notify Contractor in writing and the Contractor shall defend such claim in JPHSA’s name, at Contractor’s expense, and shall indemnify and hold harmless JPHSA against any loss, expense or liability arising out of such claim, whether or not such claim is successful. This provision is not applicable to contracts with physicians, psychiatrists, psychologists or other allied health providers solely for medical services.

30. Any equipment purchased under this contract is considered the property of JPHSA. For the purpose of this contract, equipment and/or property is defined as a tangible, durable property having a useful life of at least one (1) year and an acquisition cost of $1,000.00 or more. Contractor shall submit to JPHSA an inventory list of equipment when acquired under the contract, and any additions to the list as more equipment is acquired. Contractor agrees that upon termination of the contract, Contractor will provide a final list of all acquired equipment and provide it to JPHSA within thirty (30) days of the termination date. Contractor agrees to deliver any such equipment to JPHSA within forty-five (45) days of the termination date at Contractor’s expense. Contractor agrees not to dispose of any such equipment at any point during or after the term of the contract without the express written approval of JPHSA.
31. If Contractor is an individual provider of clinical services, Contractor shall be responsible for ensuring JPHSA is able to bill for all services provided. Contractor shall provide all relevant information necessary for JPHSA to conduct internal credentialing and privileging activities, as well as credentialing with third-party payors including, but not limited to, Medicaid, Medicare and private insurance companies. Contractor shall notify JPHSA prior to the effective date of this contract if he/she is unable to meet this obligation. Contractor shall also notify JPHSA within two (2) business days if he/she is no longer eligible to bill any third-party payor for any reason.

32. In the event Contractor misrepresents him/herself as possessing qualifications necessary for internal credentialing and privileging and/or credentialing with third party payors, or fails to provide complete information that results in Contractor’s inability to bill for services, JPHSA may terminate this contract immediately upon written notice to Contractor. Contractor shall be liable to JPHSA for any amounts JPHSA incurs due to Contractor’s inability to bill for services actually provided, and JPHSA reserves the right to withhold future invoices of Contractor to recoup such amounts.

33. Contractor agrees to protect, indemnify and hold harmless JPHSA and Jefferson Parish, from all claims for damages, costs, expenses and/or attorney fees arising in contract or tort from this contract or from any acts or omissions of Contractor’s agents, employees, officers or clients, including premises liability and including any claim based on any theory of strict liability. This provision does not apply to actions or omissions for which LA R.S. 40:1233.1 provides malpractice coverage to Contractor, nor claims related to treatment and performance of evaluations of persons when such persons cause harm to third parties (R.S. 13:5108.1(E)). Further, it does not apply to premises liability when services are performed on premises that are not owned and/or operated by JPHSA and Jefferson Parish.

34. During the Term of this contract, and for a two (2) year period immediately following the expiration or earlier termination of the term of this contract, Contractor shall not directly or indirectly solicit any individual(s) who received services from any employee or independent contractor of JPHSA at any time during the term of Contractor’s engagement with JPHSA, to become a patient or service recipient of Contractor’s medical and/or social services practice or the medical and/or social services practice of any person with whom or entity with which Contractor or any of Contractor’s immediate family members, as that term is defined in LA R.S. 42:1119, is an owner, officer, director, shareholder, partner, employee, health care consultant, or medical director.

35. During the term of this contract and for a two (2) year period immediately following the expiration or earlier termination of the term of this contract, Contractor shall not directly or indirectly solicit any employees or contractors of JPHSA to become employees or contractors of Contractor’s organization or any organizations of which Contractor or any of Contractor’s immediate family members, as that term is defined in LA R.S. 42:1119, is an owner, officer, director, shareholder, partner, fiduciary, or employee.

36. All invoices submitted to JPHSA for payment may contain a Vendor’s Statement attesting to the accuracy and completeness of the invoice. Contractor shall only bill for services/hours worked in fulfillment of this contract, and shall not duplicate any other services/hours billed to JPHSA. Contractor agrees that JPHSA is entitled to and will pursue recoupment in the event of an overpayment resulting from an error in billing.

37. For all contracts paid on an hourly basis, hours billed shall not include travel time, or time at conventions/training/seminars, unless otherwise specified in the terms of the contract. Hours billed shall be kept on a time log kept onsite at a JPHSA facility.

38. During the term of this contract, JPHSA may request from Contractor specific data in an electronic format regarding individuals served. In such cases, JPHSA will either provide to Contractor a methodology for entering the data into a JPHSA-maintained system, or will work with Contractor to develop a data-transfer methodology from Contractor’s database. In all cases of electronic data transfer, access, utilization, etc., Contractor shall be responsible for ensuring compliance with all applicable Federal and State laws, as well as JPHSA Policy, related to confidentiality of individuals served.

39. The parties agree that the legal relationship between JPHSA and Contractor is strictly an independent contractor relationship. Nothing in this contract and addendum shall be deemed to create a joint venture, agency, partnership, or employer-employee relationship between JPHSA and Contractor.

40. If any provision of this contract is held invalid, illegal, or unenforceable, the validity, legality, or enforcement of the remaining provisions will not in any way be affected or impacted. This contract will not be presumptively construed for or against either party. In the event any statements contained in the attachments to this contract conflict with language in this contract, the language contained in this contract shall prevail.
41. Unless otherwise stated, the term “days” means calendar days, and the term “including” means “including without limitation.”

42. Contractor agrees that the current contract supersedes all previous contracts, agreements, negotiations, and all other communications between the parties with respect to the subject matter of the current contract.

If Contractor is a provider of Professional Psychological Services, during the performance of this contract, Contractor hereby agrees to the following additional general terms and conditions:

1. Failure of Contractor to perform services specifically required by this contract will constitute cause for JPHSA to terminate the contract. Contractor may appeal termination of the contract for this reason in accordance with the provisions of LA R.S. 46:107.

2. Contractor shall abide by all applicable federal and state laws pertaining to individuals with Developmental Disabilities; including but not limited to Act 378 of the 1989 Louisiana Legislative Session; state Developmental Disabilities law; the Developmental Disabilities Assistance and Bill of Rights Act of 2000; as well as all requirements of the U.S. Department of Health and Human Services, all applicable licensure and regulatory requirements and standards, and all applicable requirements of Title XIX of the Social Security Act.

3. Contractor agrees to establish and abide by JPHSA policies and procedures that adhere to federal and state statutory requirements and to applicable regulatory and licensure standards for reporting and investigating allegations of abuse, neglect and exploitation, and where applicable, taking appropriate preventative corrective action.

If Contractor is an individual performing Professional or Social Services On-Site at a JPHSA facility, during the performance of this contract, Contractor hereby agrees to the following additional general terms and conditions:

1. Contractor agrees that during the term of this contract, he/she will function as a JPHSA contract staff member, as defined by JPHSA policies and procedures. However, the parties agree that the legal relationship between JPHSA and Contractor is strictly an independent contractor relationship. Nothing in this contract or any attachments hereto shall be construed to create a joint venture, agency, partnership, or employer-employee relationship between JPHSA and Contractor.

2. Contractor agrees to adhere to all JPHSA policies and procedures as applicable, including submitting to a drug screening as required per the Drug-Free Workplace policy. JPHSA reserves the right to terminate the agreement with Contractor for failure to adhere to JPHSA policies and procedures.

3. If Contractor is an individual physician, advanced practice registered nurse/nurse practitioner, registered nurse, social worker, professional counselor, psychologist, dentist, or any other medical or social service provider performing work on-site at JPHSA facilities on behalf of JPHSA or its programs, JPHSA agrees to provide medical malpractice and/or general liability coverage as applicable.

If Contractor is a “subrecipient” of federal funds under this contract, as defined in 2 CFR Part 200 and 45 CFR Part 75 (Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards/HHS Awards), Contractor hereby agrees to the following additional general terms and conditions:

1. Contractor shall comply with all applicable requirements of 2 CFR Part 200, including but not limited to the following:
   a. Contractor must disclose any potential conflict of interest to JPHSA as required by 2 CFR §200.112/45 CFR §75.112.
   b. Contractor must disclose to JPHSA, timely and in writing, all violations of federal criminal laws that may affect the federal award, as required by 2 CFR §200.113/45 CFR §75.113.
   c. Contractor must safeguard protected personally identifiable information and other sensitive information, as required by 2 CFR §200.303/45 CFR §75.303.
   d. Contractor must have and follow written procurement standards and procedures in compliance with federally approved methods of procurement, as required by 2 CFR §§200.317 - 200.326/45 CFR §§75.326 – 75.335.
   e. If Contractor is a non-profit or governmental entity who expects to expend more than $750,000 in federal grant funding during the Fiscal Year, Contractor must comply with the audit requirements set forth in 2 CFR §§200.501 - 200.521/45 CFR §§75.501 – 75.521, as applicable.
   f. If Contractor is a for-profit entity, Contractor must comply with audit and reporting requirements established by JPHSA, as required by 2 CFR §200.501(h)/45 CFR §75.501(h).
THIS CONTRACT CONTAINS OR HAS ATTACHED HERETO ALL THE TERMS AND CONDITIONS AGREED UPON BY THE CONTRACTING PARTIES. IN WITNESS THEREOF, THIS CONTRACT IS SIGNED AND ENTERED INTO ON THE DATE INDICATED BELOW.

<table>
<thead>
<tr>
<th>CONTRACTOR</th>
<th>JEFFERSON PARISH HUMAN SERVICES AUTHORITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNATURE:</td>
<td>SIGNATURE:</td>
</tr>
<tr>
<td>DATE</td>
<td>DATE</td>
</tr>
<tr>
<td>NAME:</td>
<td>NAME: Rosanna DiChiro Derbes, Psy.D.</td>
</tr>
<tr>
<td>TITLE:</td>
<td>TITLE: Executive Director</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>JPHSA DIVISION DIRECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGNATURE:</td>
</tr>
<tr>
<td>DATE</td>
</tr>
<tr>
<td>NAME:</td>
</tr>
<tr>
<td>TITLE:</td>
</tr>
</tbody>
</table>
MONITORING PLAN

For

Jefferson Parish Human Services Authority
Hurricane Repairs & Renovation Project
JPHSA Proposal No. 23-002

Personnel assigned to monitoring are identified as follows:

Design Professional
Annie P. Labruzzo, Architect LLC

1. The contractor shall submit pay applications to the Design Professional, as per Section 01 2900 of the Project Manual titled Payment Procedures.

Majied Harris
Contract Monitor

1. The Design Professional shall report completed tasks along with certified pay applications to the Facility Asset & Risk Management (FARM) Director.

Jonnie Benedict
Fiscal Monitor

1. The Fiscal Monitor shall review and approve all invoices before payment of the invoice.
2. The Fiscal Monitor shall review all documentation pertaining to deliverables, including:
   a) Pay applications
   b) Contract documents

Schedule upon Authorization To Proceed:

a) The contractor is responsible for and must provide any/all necessary licenses and permits before the commencement of any/all work.
b) The contractor must field verify existing conditions within 14 days after the Authorization To Proceed has been issued.
c) The contractor shall commence work within 30 days after the Authorization To Proceed has been issued.
d) Substantial completion within 180 days after the Authorization To Proceed has been issued.
e) Punch list completion within 210 days after the Authorization To Proceed has been issued.

1. The Design Professional, FARM Director, and Fiscal Monitor must confirm compliance and completion of all duties and assigned tasks as outlined in the Project Manual.

Krystal Miller
06/21/2023
**W-9**

**Request for Taxpayer Identification Number and Certification**

Go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9) for instructions and the latest information.

**Part I  Taxpayer Identification Number (TIN)**

Enter your TIN in the appropriate box. The TIN provided must match the name given on line 1 to avoid backup withholding. For individuals, this is generally your social security number (SSN). However, for a resident alien, sole proprietor, or disregarded entity, see the instructions for Part I, later. For other entities, it is your employer identification number (EIN). If you do not have a number, see How to get a TIN, later.

**Note:** If the account is in more than one name, see the instructions for line 1. Also see What Name and Number To Give the Requester for guidelines on whose number to enter.

**Part II  Certification**

Under penalties of perjury, I certify that:

1. The number shown on this form is my correct taxpayer identification number (or I am waiting for a number to be issued to me); and
2. I am not subject to backup withholding because: (a) I am exempt from backup withholding, or (b) I have not been notified by the Internal Revenue Service (IRS) that I am subject to backup withholding as a result of a failure to report all interest or dividends, or (c) the IRS has notified me that I am no longer subject to backup withholding; and
3. I am a U.S. citizen or other U.S. person (defined below); and
4. The FATCA code(s) entered on this form (if any) indicating that I am exempt from FATCA reporting is correct.

**Certification instructions.** You must cross out item 2 above if you have been notified by the IRS that you are currently subject to backup withholding because you have failed to report all interest and dividends on your tax return. For real estate transactions, item 2 does not apply. For mortgage interest paid, acquisition or abandonment of secured property, cancellation of debt, contributions to an individual retirement arrangement (IRA), and generally, payments other than interest and dividends, you are not required to sign the certification, but you must provide your correct TIN. See the instructions for Part II, later.

**General Instructions**

Section references are to the Internal Revenue Code unless otherwise noted.

**Future developments.** For the latest information about developments related to Form W-9 and its instructions, such as legislation enacted after they were published, go to [www.irs.gov/FormW9](http://www.irs.gov/FormW9).

**Purpose of Form**

An individual or entity (Form W-9 requester) who is required to file an information return with the IRS must obtain your correct taxpayer identification number (TIN) which may be your social security number (SSN), individual taxpayer identification number (ITIN), adoption taxpayer identification number (ATIN), or employer identification number (EIN), to report on an information return the amount paid to you, or other amount reportable on an information return. Examples of information returns include, but are not limited to, the following:

- Form 1099-INT (interest earned or paid)
- Form 1099-DIV (dividends, including those from stocks or mutual funds)
- Form 1099-MISC (various types of income, prizes, awards, or gross proceeds)
- Form 1099-B (stock or mutual fund sales and certain other transactions by brokers)
- Form 1099-S (proceeds from real estate transactions)
- Form 1099-K (merchant card and third party network transactions)
- Form 1098 (home mortgage interest), 1098-E (student loan interest), 1098-T (tuition)
- Form 1099-C (canceled debt)
- Form 1099-A (acquisition or abandonment of secured property)

Use Form W-9 only if you are a U.S. person (including a resident alien), to provide your correct TIN.

**If you do not return Form W-9 to the requester with a TIN, you might be subject to backup withholding. See What is backup withholding, later.**

Cat. No. 10231X  
Form W-9 (Rev. 10-2018)
BOARD RESOLUTION

On the _________________________ day of__________________________, 20____________,
at a meeting of the Board of Directors of____________________________________________,
held in the City of______________________________________________________________,
a quorum of the Directors present, the following business was conducted:

It was duly moved and seconded that the following resolution be adopted:

BE IT RESOLVED that the Board of Directors of the above corporation do hereby authorize
_______________________________________________________________ (Name and Title)
and his/her successors in office to negotiate, on terms and conditions that he/she may deem
advisable, a contract or contracts with Jefferson Parish Human Services Authority, and to
execute said documents on behalf of _________________________________, and further, do
hereby grant him/her the power and authority to do all things necessary to implement, maintain,
amend, or renew said contract or contracts.

The above resolution was passed by a majority of those present and voting in accordance with
the bylaws and Articles of Incorporation.

I certify that the above and foregoing constitutes a true and correct copy of a part of the minutes
of a meeting of the Board of Directors of _________________________________, held on
the _________________________ day of __________________________, 20__________.

________________________________________________________
Authorized Board Representative

Print Name:
Title:

Subscribed and sworn before me, __________________________________________________,
a Notary Public for the Parish/County of ________________________________________,
on the _________________________ day of __________________________, 20__________.

________________________________________________________
Notary Public, State of:
Parish/County of:
Notary Public ID No.: 
Corporate Disclosures

List of Corporate Officers as appearing on the Corporation’s Registration with the __________________ Secretary of State’s Office.

________________________________________  _______________________________________

________________________________________  _______________________________________

________________________________________  _______________________________________

________________________________________  _______________________________________

________________________________________  _______________________________________

________________________________________  _______________________________________
STANDARD PROVISIONS FOR CONSTRUCTION CONTRACTS

1. The Contract Term shall commence on the effective date as set forth in the Contract; or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed.

2. Contractor agrees that the work will be substantially completed within one hundred and eighty (180) days of effective date, and completed and ready for final acceptance in accordance with the General Conditions contained in the Statement of Work by the contract termination date. Contractor acknowledges that these deadlines account for lost production time due to inclement weather.

3. Contractor agrees that in the event of a delay on the part of Contractor causing production to go beyond the contract termination date, Contractor shall pay JPHSA five hundred dollars ($500) per day as stipulated (liquidated) damages, until the work is ready for final acceptance in accordance with the General Conditions contained in the Statement of Work.

4. Contractor further agrees that in addition to and not in lieu of the foregoing liquidated damages, JPHSA shall be entitled to recover from Contractor or Contractor's surety additional liquidated damages as applicable per the General Conditions contained in the Statement of Work.

As a condition of entering into this Contract, Contractor makes the following representations:

1. Contractor has visited the site where work is to be performed ("the site"), and has carefully examined and is satisfied as to the nature and extent of the Contract documents (i.e. the Contract and all attachments, Statements of Work, building specifications, bidding documents, addenda, and change orders; as well as all applicable laws, regulations, policies, and/or procedures, and any other documents pertaining to the Contract and/or work of which Contractor has been made aware).

2. Contractor has familiarized him/herself with and is satisfied as to the work and locality, as well as all general, local, and site conditions and federal, state, and local laws and regulations, which may affect cost, progress, performance or furnishing of the work.

3. Contractor agrees to adhere to all applicable federal, state, and local laws and regulations, as well as JPHSA policy, in completing the work as specified by the Contract documents.

4. Contractor has carefully studied all reports of explorations and tests of subsurface conditions at or contiguous to the site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except underground facilities) as identified in the Contract documents or any change orders or addenda thereto, as well as the reports and drawings of a Hazardous Environmental Condition, if any, at the site identified in the Bidding Documents or in any addenda thereto. Contractor is entitled to rely on all such reports and drawings, however Contractor acknowledges that JPHSA and Design Professional do not assume responsibility for the accuracy or completeness of information and data shown or indicated in the Contract documents with respect to Underground Facilities at or contiguous to the site.

5. Contractor has obtained and carefully studied all additional supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the site or otherwise which may affect cost, progress, performance or furnishing of the work or which relate to any aspect of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and
programs incident thereto. Contractor does not consider that any additional
examinations, investigations, explorations, tests, studies or data are necessary for the
performance and furnishing of the work as specified in the Contract documents.

6. Contractor is aware of the general nature of work to be performed by JPHSA and
others at the site that relates to the work, as indicated in the Contract documents.

7. Contractor has correlated the information known to Contractor, information and
observations obtained from visits to the site, reports and drawings identified in the
Contract documents, and all additional examinations, investigations, explorations,
tests, studies, and/or data pertinent to the work to be performed.

8. Contractor has given Design Professional written notice of all conflicts, errors,
ambiguities or discrepancies that Contractor has discovered in the Contract
Documents, and agrees that the written resolution thereof by Design Professional is
acceptable, and the Contract Documents are generally sufficient to indicate and
convey an understanding of all terms and conditions for performance and furnishing
of the work.
Jefferson Parish Human Services Authority
Conflict of Interest Disclosure Form

Contractor Name: __________________________________________

Please provide responses to the following questions and identify all current involvements which might produce a conflict of interest in conjunction with your contract with Jefferson Parish Human Services Authority / JeffCare. All questions apply to Contractor, its owners, employees, officers, trustees, or other individuals with a substantial economic interest in Contractor’s organization, their immediate family members*, and any other entity in which Contractor or its employees have a substantial economic interest.

1. Please list all current involvement or interest in any contract or business matter with JPHSA/JeffCare or any of its staff members.

________________________________________________________________________

________________________________________________________________________

2. Please list all pending contracts or bids with JPHSA/JeffCare or any of its staff members.

________________________________________________________________________

________________________________________________________________________

3. Please list all current owners, employees, officers, trustees, or other individuals with a substantial economic interest in your organization who are currently employed or have been employed within the last two (2) years by JPHSA/JeffCare.

________________________________________________________________________

________________________________________________________________________

4. Please list any and all current owners, employees, officers, trustees, or other individuals with a substantial economic interest in your organization who have a substantial economic interest in JPHSA/JeffCare.

________________________________________________________________________

________________________________________________________________________

5. Please list and describe the nature of any other affiliation or involvement which may cause a conflict with the contract with JPHSA/JeffCare.

________________________________________________________________________

________________________________________________________________________

I hereby certify that the information set forth above is true and complete to the best of my knowledge.

Contractor Signature: ___________________________ Date: __________

Signed By: ___________________________ Title: ___________________________

JPHSA Compliance Officer Determination:

☐ No potential conflict of interest.  ☐ Potential conflict of interest.

Compliance Officer: ___________________________ Date: ___________________________

*Immediate family members include: your children; the spouses of your children; your brothers and sisters; the spouses of your brothers and sisters; your parents; your spouse; and the parents of your spouse.
Part 1 – General

1.1 Summary

A. Project identification:
   Jefferson Parish Human Services Authority
   Elmwood Renovations
   1500 River Oaks Road West
   Elmwood, LA 70123

B. Project Summary: The time allocated for the project is 180 (one hundred eighty) calendar days to achieve substantial completion. Liquidated damages will be assessed by JPHSA at five hundred ($500) per day as stipulated (liquidated) damages until the work is ready for final acceptance in accordance with the General Conditions contained in the Statement of Work.

   The project includes work associated with hurricane damage repairs and interior renovations to an existing office building into newly organized office spaces for the Jefferson Parish Human Services Authority’s Elmwood Location as described in the Construction Documents.

C. Additional Time Due to Weather: If adverse weather conditions are the basis for a claim for additional time, the Contractor shall document that weather conditions had an adverse effect on the scheduled construction. An increase in the contract time due to weather shall not be cause for an increase in the contract sum.

   The following are considered reasonably anticipated days of adverse weather on a monthly basis:

   | January: 11 days | May: 5 days | September: 4 days |
   | February: 10 days | June: 6 days | October: 3 days |
   | March: 8 days | July: 6 days | November: 5 days |
   | April: 7 days | August: 5 days | December: 8 days |

   If the Contractor shall ask for total adverse weather days, the Contractor’s request shall be considered only for days over the allowable number of days stated above.

   Note: Contract is on a calendar day basis.

D. Particular Project Requirements:

   1. Existing site conditions and restrictions: The building will have specific elements to remain untouched by this project. The Contractor will protect these elements and not disturb these elements.

   E. Permits: Jefferson Parish Purchasing Department has requirements to obtain a building permit for the project by the general Contractor per general conditions of the contract.
F. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect and Owner.

G. Dimensions: Verify dimensions indicated on drawings with field dimensions before preparation of shop drawings, fabrication or ordering of materials. Do not scale contract documents.

H. Existing Conditions: Notify Architect and Owner of existing conditions differing from those indicated in the Contract Documents. Do not remove or alter structural components without prior written approval.

I. Definition for terms used in the Specifications:

1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
2. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements. Refer to limitations of “Approved” in General and Supplementary Conditions.
3. Match Existing: Match existing as acceptable to the Architect and Owner.
4. Intent: Drawings and Specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonable implied or necessary for proper performance of the project shall be included.
5. Writing Style: Specifications are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, “Provide tile” means Contractor shall provide and install tile.

**Part 2 – Products** - Not applicable to this Section.

**Part 3 – Execution** - Not applicable to this Section.

End of Section
01 26 00 Contract Modification Procedures

Part 1 – General

1.1 Summary

A. Section Includes: Administrative and procedural requirements for handling and processing contract modifications as follows:
   1. Minor Changes in the Work
   2. Change Order Proposal requests.
   3. Construction Change Directives.

B. Related Sections:
   1. Document – 00 72 00 General Conditions of the Project.
   2. Section 01 29 00 - Payment Procedures: Administrative procedures governing applications for payment.
   3. Section 01 32 00 - Construction Progress Documentation: Contractor's construction schedule.
   4. Section 01 63 00 - Product Substitution Procedures: Administrative procedures for handling requests for product substitutions after award of the Contract.

1.2 Minor Changes in the Work

A. Supplemental instructions: In accordance with General Conditions – Paragraph 7.4, the Architect will issue supplemental instructions, in writing, authorizing minor changes in the Work, not involving an adjustment to the Contract Sum or Contract Time.

1.3 Change Order Proposal Requests

A. General: Provisions for Change Orders are specified in General Conditions - Paragraph 7.2.

B. Work Change Proposal Requests: Proposed changes in the Work that will require adjustment to the Contract Sum or Contract Time will be issued by the Architect, with a detailed description of the proposed change and supplemental or revised Drawings and Specifications, if necessary.
   1. Proposal requests issued by the Architect are for information only. Do not consider them an instruction either to stop work in progress, or to execute the proposed change.
   2. Unless otherwise indicated in the proposal request, within seven (7) calendar days of receipt of the proposal request, submit to the Architect for the Owner's review an estimate of cost to execute the proposed change. Include an itemized list of work to be added or deleted with labor and material unit costs including subcontracts. If requested, substantiate costs and quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
   3. State the effect the proposed change in the Work will have on the Contract Time.

C. Contractor Initiated Proposal Requests: When latent or other unforeseen conditions require modifications to the Contract, or when the Contractor considers a change may benefit the Owner by expediting construction, the Contractor may propose changes by submitting a request for a change to the Architect.
1. Include a statement outlining the 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 Contract Time.

2. Include an itemized list of work to be added or deleted with labor and material unit costs. When requested, substantiate costs and quantities. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.

3. Comply with requirements of “Section 01 6300 - Product Substitution Procedures” if the proposed change in the Work involves the substitution of one product or system for a product or system specified.

D. Authorization to Proceed with Change: When the Contractor and the Architect are in agreement regarding adjustment to the Contract Sum or Contract Time resulting from a proposed change in the Work, the Architect will prepare a formal Change Order fully describing the change and specifying any adjustment to the Contract Sum or Contract Time. This Change Order shall be signed by the Architect, the Owner, and the Contractor and shall become part of the Contract Documents when signed by all three.

1.4 Construction Change Directives

A. Construction Change Directives: When the Owner determines it is in the best interest of progress of the work, or when the Owner and Contractor are not in total agreement on the terms of a Change Order Proposal, the Owner may request the Architect to issue a Change Directive instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The Construction Change Directive will contain a complete description of the change in the Work and designate the method to be followed to determine change in the Contract Sum or Contract Time.

B. Documentation: If the Construction Change Directive so orders, the Contractor shall maintain detailed records of workers’ time and material used in performing the work required by the Construction Change Directive.

1. After completion of the change, the Contractor shall submit an itemized account and supporting data, including subcontract breakdowns, necessary to substantiate cost and time adjustments to the Contract and permit preparation of a Change Order.

1.5 Change Order Procedures

A. Change Order Form: Upon the Owner's approval of a Work Change Proposal Request, Contractor Initiated Proposal Request, Construction Change Directive, the Architect will issue a Change Order for signatures by the Owner and Contractor on AIA Form G 701, as provided in the General Conditions of the Contract.

B. Time Extensions: Extension of Contract Time, whether or not related to a change in Contract Sum, will be authorized By Change Order.

Part 2 – Products (Not Used)

Part 3 – Execution (Not Used)

End of Section
01 29 00 Payment Procedures

Part 1 – General

1.1 Summary
   A. Section Includes: Administrative and procedural requirements governing the Contractor’s Applications for Payment.
   B. Related Sections:
      1. Section 01 3100 - Project Management and Coordination.
      2. Section 01 3140 - Project Meetings.
      3. Section 01 3200 - Construction Progress Documentation: Contractor’s construction schedule.
      4. Section 01 7700 - Closeout Procedures.

1.2 Schedule of Values
   A. General: Submit a Schedule of Values as required by General and Supplementary Conditions. Coordinate preparation of the Schedule of Values with other administrative schedules and forms, including:
      1. Contractor’s construction schedule (Section 01 32 00).
      2. List of subcontractors and major suppliers (General Conditions).
      3. Products list (Section 01 33 00).
      4. Schedule of submittals (Section 01 33 00).
   B. Submittal Date: Submit the Schedule of Values to the Architect at the Pre-Construction Conference specified in Section 01 3140.
   C. Format and Content: Prepare the Schedule of Values on AIA Document G703, using columns A, B, and C. Use the Project Manual Table of Contents as a guide to establish the format for the Schedule of Values.
      1. Content: Indicate the following for each item listed:
         a. Related Specification Section number and name.
         b. Quantity of work (number of units, sq. ft., etc.).
         c. Dollar value to nearest whole dollar, adjusted to equal total Contract Amount.
      2. Job Overhead Costs: The Contractor’s, administrative costs, superintendence, temporary facilities and other major cost items that are not directly related to cost of actual work in place are to be shown as separate line items in the Schedule of Values or distributed as general overhead expense.

1.3 Applications for Payment
   A. Payment Application Requirements: In accordance with General and Supplementary Conditions, submit monthly Application for Payment with required supporting data.
      1. General: Each Application for Payment shall be consistent with the Schedule of Values and with previous applications and payments as certified by the Architect and paid by the Owner.
2. Notarization: Each Application for Payment shall be notarized.
3. The Contractor shall submit an update of the project schedule with each application for payment. Owner’s obligation to make payment is contingent upon Contractor’s compliance with this requirement.
4. Special Requirements: The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

B. Payment Times: Progress payments shall be submitted to the Architect no later than the 26th day of the month. The period covered by each Application for Payment is one month ending on the 25th day of the month.

C. Payment Application Forms: Use AIA Document G 702 and Continuation Sheets G 703 as the form for Application for Payment.

D. Application Preparation: Complete every entry on the form, including notarization and execution by person authorized to sign legal documents on behalf of the Contractor. Incomplete applications will be returned without action.
   1. Entries shall match data on the Schedule of Values and current Contractor's Construction Schedule.
   2. Include as additional line items amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

E. Transmittal: Submit original and 3 executed copies of each Application for Payment to the Architect by means ensuring receipt within 24 hours.
   1. Architect will transmit original certification to the Owner, one copy with certification to Contractor. Architect will retain one copy for records. Resident Project Representative will retain one copy.

F. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of the first Application for Payment include the following:
   1. List of subcontractors and major suppliers (General Conditions).
   2. Schedule of Values (Section 01 29 00).
   3. Contractor's Construction Schedule (Section 01 32 00).
   4. Submittal Schedule (Section 01 33 00).
   5. List of Contractor's staff assignments (Section 01 31 20).
   6. Copies of building permits (General Conditions).
   7. Copies of authorizations and licenses from governing authorities for performance of the Work (General Conditions).
   8. Certificates of insurance and insurance policies (General Conditions).

G. Application for Payment at Substantial Completion: Following issuance of the AIA Documents G704-2000 Certificate of Substantial Completion, submit an Application for Payment; this application shall reflect any Beneficial Occupancy Forms issued previously for Owner partial occupancy of designated portions of the Work.
   1. Administrative actions and submittals that shall proceed or coincide with this application are specified in Section 01 77 00.
2. In the Application for Payment that first follows the date of Substantial Completion, show 100 percent completion for the portion of the Work claimed as substantially complete.
   a. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

H. Final Payment Application: Administrative actions and submittals which must precede or coincide with the final Application for Payment are specified in “Section 01 77 00 - Closeout Procedures”.

Part 2 – Products (Not Used)

Part 3 – Execution (Not Used)

End of Section
01 31 00 Project Management Coordination

Part 1 – General

1.1 Summary

A. This Section includes: Requirements for project coordination include, but not necessarily limited to:
   1. Construction activities.
   2. Submittals.
   3. Requests for Information (RFIs).
   5. Cleaning and protection.

B. Related Sections include:
   1. Document 00 72 00 - General Conditions.
   2. Section 01 11 00 – Summary of the work.
   4. Section 01 32 00 - Construction Progress Documentation: Contractor’s Construction Schedule.
   5. Section 01 60 00 - Product Requirements: Coordinating general installation.
   6. Section 01 77 00 - Closeout Procedures: Coordinating Contract closeout.

1.2 Construction Activities

A. Coordination: Coordinate and schedule activities (including submittals, testing, and preparations) to assure efficient and orderly installation of each part of the Work. See additional requirements in “Section 01 32 00 – Construction Progress Documentation.”

   1. Sequence activities to obtain the best installation and in-place performance.
   2. Coordinate installation of components to assure adequate accessibility for installation, maintenance, service and repair.
   3. Make necessary provisions for items scheduled for later installation under the Contract and by separate contractors.
   4. Schedule product deliveries to assure continuity and proper sequence of operations, without delay and interruptions.
   5. Verify that equipment items are suitable for available mechanical and electrical systems.

B. Communications: Where necessary, distribute instructions for coordination.

   1. Prepare and issue memoranda for the Owner and separate contractors where coordination of their work is required.

C. Administrative Procedures: Coordinate administrative activities with construction to avoid delays and assure orderly progress of the Work. Such activities include, but are not limited to, the following:

   1. Preparation of schedules.
   2. Installation and removal of temporary facilities.
   3. Delivery and processing of submittals.
   4. Project closeout activities.
1.3 Submittals

A. Staff Names: Within 5 days after Notice to Proceed, submit a list of Project staff assignments, with individual names, their assignments, telephone numbers and mailing addresses, to the Owner and Architect.

B. Coordination Drawings: Prepare and submit Coordination Drawings for installation of products and materials.

   1. Show the relationship of components shown on separate Shop Drawings.
   2. Indicate required installation sequences.
   3. Comply with requirements contained in “Section 01 3200 – Construction Project Documentation”.

1.4 Requests for Information (RFI) Document 01 31 30

A. Coordination: All requests for information generated by subcontractors, vendors, etc. shall be submitted to Contractor for investigation and response.

   1. If, in the opinion of the Contractor, the requested information requires an interpretation or decision by the Architect, the Contractor shall submit a request for information (RFI) to the Architect.

B. RFI Form: All requests for information shall be submitted to the Architect on the form included at the end of this Section. No other forms will be accepted.

   1. All applicable spaces on the RFI form shall be filled-out.

C. Response: Architect will render a response within 10 working days of receipt of the completed RFI form.

   1. Incomplete RFIs will be returned “without action” for resubmittal.
   2. RFIs that do not require an interpretation of the Contract Documents for the execution of the Work will be returned “Not Applicable.”
   3. Commencement of the Work in accordance with the Architect’s RFI response shall indicate Contractor’s acknowledgment that there will be no change in the Contract Sum or Contract Time.

D. RFI Logs: Contractor shall prepare and maintain a log of RFIs containing the following:

   1. Project name and number.
   2. Contractor name, address, telephone and fax number.
   3. Spread sheet type categories for RFI number, company/contractor initiating RFI, date issued, date response requested, date response received.

Part 2 – Products (Not Used)

Part 3 – Execution

3.1 General Installation Provisions
A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.


3.2 Cleaning and Protection

A. During Handling and Installation: Clean and protect construction in progress and adjoining materials in place.
   1. Apply protective covering where necessary to ensure protection from damage or deterioration at Substantial Completion.
   2. Clean and maintain completed construction through the remainder of the construction period.

B. Limiting Exposures: Supervise construction activities to ensure that no part of the construction, completed or in progress, is subject to excessive loading, damaging temperature and humidity extremes, staining, contact between incompatible materials, and similar harmful and deteriorating exposure during the construction period.

C. Repair and Replacement: If any parts of the construction are deteriorated, become damaged, develop defects, or are otherwise not in compliance with requirements of the Contract, they shall be cleaned, restored to proper condition, repaired acceptably, or replaced with new products prior to requesting Architect’s inspection for Substantial Completion or Final Completion.

End of Section
01 31 19_Project Meetings

Part 1 – General

1.0 Related Documents

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

1.1 Summary

A. This Section includes: Administrative and procedural requirements for project meetings, including, but not limited to:

   1. Procedures.
   2. Pre-construction conference.
   3. Pre-installation conferences.
   4. Progress meetings or Owner - Architect - Contractor (OAC) meetings.
   5. Called meetings.

B. Related Sections include:

   1. Section 01 31 00 - Project Management and Coordination: Coordinating Project meetings with other construction activities.
   2. Section 01 32 00 - Construction Progress Documentation: Contractor's Construction Schedule.

1.2 Procedures

A. General: Requirements of this Section amplify and do not modify provisions of the General and Supplementary Conditions. This Section specifies administrative and procedural requirements for Project meetings.

B. Contractor's Responsibility: Project meetings are administrative activities to facilitate the Contractor's direction of the Work. As such, it is the responsibility of the Contractor to implement understandings reached during meetings, unless otherwise stated.

C. Location: Unless otherwise agreed in advance, hold meetings at the Project site.

D. Pre-Construction Conference: The Architect will keep minutes of meeting and promptly distribute copies to the Owner, and the Contractor. The Contractor shall distribute minutes to Subcontractors, other attendees and interested parties.

E. All Other Project/Construction Meetings: The Contractor will keep minutes of meetings and promptly distribute copies to the Owner, the Architect and other attendees and interested parties.

F. Attendance: Contractor shall require attendance at meetings of Owner, General Contractor and Architect. The Architect will attend in the capacity of the Owner's representative and interpreter of Contract requirements.
G. Additional Meetings: The Contractor shall arrange for meetings, in addition to those specified in this Section, as necessary for the performance of the Work according to the Contractor's schedule, or as instructed by the Architect at the request of the Owner.

1.3 Pre-Construction Conference

A. General: After notification that the Contract has been executed, the Architect shall arrange with the Owner, and Contractor, and conduct a Pre-Construction Conference to be held at the Project site. The Contractor shall be responsible to see that his principal subcontractors are in attendance and shall furnish to the Architect, Owner, and the following:

1. Schedule of Values.
2. List of subcontractors and material suppliers.
3. Contractor's Construction Schedule.
4. Documentation, qualification data and certificates as required by Owner and/or Architect.

B. Attendees: The Owner, Architect and Architect's consultants, the General Contractor and its superintendent, and other concerned parties shall each be represented at the conference by persons familiar with and authorized to conclude matters relating to the Work.

C. Minimum Agenda: Distribute data on, and discuss:

1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, material suppliers, and Architect.
2. Channels and procedures for communications.
3. Construction schedule, including sequence of critical Work.
4. Contract Documents, including distribution of required copies of original Documents and Revisions; Owner's acceptance/rejection of Alternates.
5. Processing of Shop Drawings and other data submitted to Architect for review.
6. Processing for field decisions and Change Orders.
9. Quality control.
11. Equipment deliveries and priorities.
13. Office, work, and storage areas.
14. Use of premises.
15. Preparation of Record Documents.
16. Working hours.
17. Policy for Owner initiated delay days.

1.4 Pre-Installation Conferences

A. Requirements: The Contractor shall arrange and conduct a pre-installation conference at the site. The 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 the Owner and Architect of scheduled meeting dates.

B. Purpose: Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
2. Options.
3. Related Change Orders.
4. Purchases.
5. Deliveries.
6. Shop Drawings, Product Data and quality control samples.
7. Possible conflicts.
9. Time schedules.
10. Weather limitations.
11. Manufacturer’s recommendations.
14. Temporary facilities.
15. Space and access limitations.
17. Safety.
18. Inspection and testing requirements.
20. Recording requirements.

C. Reporting: Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Distribute the record of the meeting to everyone concerned, promptly, including the Owner and Architect.

D. Problems: Do not proceed with affected work if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

1.5 Progress Meetings (OAC)

A. Requirements: The Contractor shall schedule and the Architect will conduct progress meetings (OAC) at regular bi-weekly intervals, unless otherwise scheduled during construction.

B. Attendees: The Architect, Owner and Contractor shall meet and review the current status and future expected progress of the project.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine status of each activity in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how work behind schedule will be expedited; secure commitments from parties involved to do so. Discuss need for schedule revisions to ensure that current and subsequent activities will be completed within the Contract Time.

2. Review the present and future needs of the Contractor, including such items as:
   a. Coordination requirements
   b. Submittals.
   c. Open RFI.
   d. Time.
   e. Sequences.
f. Deliveries.
g. Off-site fabrication problems.
h. Access.
i. Site utilization.
j. Temporary facilities and services.
k. Hours of Work.
l. Safety.
m. Housekeeping.
n. Quality and Work standards.
o. Change Orders.
p. Documentation of information for payment requests.

D. Reporting: After each progress meeting date, the Contractor shall send copies of meeting minutes to the Owner, the Architect and to other parties present and to other parties who should have been present.

   1. Action: Responsibility for action and date for completing action shall be indicated for each item requiring resolution.

E. Schedule Updating: The Contractor shall revise the construction schedule prior to each progress meeting where revisions to the Schedule have been made or recognized. The Contractor shall issue the revised Schedule as specified in Section 01 32 00.

1.6 Called Meetings

   A. Called meetings may be scheduled in addition to regularly scheduled Progress Meetings. All applicable personnel will be required to attend.

Part 2 – Products (Not Used)

Part 3 – Execution (Not Used)

End of Section
01 31 30 Request for Information (RFI)

<table>
<thead>
<tr>
<th>From:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact Name</td>
<td>RFI No:</td>
</tr>
<tr>
<td>Title</td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td></td>
</tr>
<tr>
<td>Email</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jefferson Parish Human Services Authority Hurricane Repairs and Renovation Project</td>
<td>Spec No.</td>
</tr>
<tr>
<td>1500 River Oaks Road West, Elmwood, LA 70123</td>
<td></td>
</tr>
<tr>
<td>JPHSA Proposal No. 23-002</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annie P. Labruzzo, Architect LLC</td>
<td>Spec No.</td>
</tr>
<tr>
<td>P.O. Box 791301</td>
<td></td>
</tr>
<tr>
<td>New Orleans, LA 70179</td>
<td></td>
</tr>
<tr>
<td>(985) 517-6392</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Attn:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annie P. Labruzzo</td>
<td>Spec No.</td>
</tr>
<tr>
<td>Email <a href="mailto:annie@aplarch.com">annie@aplarch.com</a></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subject:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposed Solution:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signed:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>P.O.R. Response:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Signed:</th>
<th>Reference:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: This reply is not an authorization to proceed with work involving additional cost, time or both. If any reply requires a change to the Contract Documents, a Change Order, Construction Change Directive or a Minor Change in the work must be executed in accordance with the Contract Documents.
01 32 00 Construction Progress Documentation

Part 1 – General

1.1 Summary

A. This 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. Submittals Schedule.
   3. Daily field construction reports to include weather and site conditions.

B. See Division 01 Section "Payment Procedures" for submitting the Schedule of Values.

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 activities are activities on the critical path. They 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. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Events: The starting or ending point of an activity.

1.3 Submittals

A. Submittals Schedule: Submit two (2) copies of schedule. Arrange the following information in a bar chart format:

   1. Scheduled date for first submittal.
   2. Specification Section number and title.
   3. Submittal category (action or informational).
   4. Name of subcontractor.
   5. Description of the Work covered.
   6. Scheduled date for Architect's final release or approval.

B. Preliminary Network Diagram: Submit two (2) opaque copies, large enough to show entire network for entire construction period. Indicate logic ties for activities.

C. Daily field reports submitted electronically Bi-Weekly (every other week) to Architect and Owner.
1.4 Submission and Review

A. Preliminary Meeting: Participate in preliminary meeting to discuss proposed schedule, requirements of this Section prior to submission of network.

B. Proposed Plan: Submit a schedule for the 90 days of the work within 7 days of Contract Award.

1.5 Coordination

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittals Schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from parties involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

Part 2 – Products

2.1 Submittals Schedule

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

2.2 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. Milestones: Milestones are a key or critical point in time for reference or measurement. The following MANDATORY milestone topics should be included in your critical path project schedule as a condition of acceptance of the project schedule. Include milestones indicated below but not limited to the following:

1. Notice to Proceed
2. Temporary utilities
3. Material Receipt (piling, concrete pours, pre-engineered building, building panels, generator, and overhead crane.)
4. Punch List
5. Substantial Completion
6. Final Completion

C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using fragnets to demonstrate the effect of the proposed change on the overall project schedule.
2.3 Reports

A. Construction Reports: Prepare a weekly construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Equipment at Project site.
3. Material deliveries.
4. High and low temperatures and general weather conditions.
5. Accidents.
6. Meetings and significant decisions.
7. Stoppages, delays, shortages, and losses.
8. Emergency procedures.
9. Orders and requests of authorities having jurisdiction.

B. Field Condition Reports: Immediately on discovery of a difference between field conditions and the Contract Documents, prepare and submit a detailed report. Submit with a request for interpretation. 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 bi-weekly intervals, update schedule to reflect actual construction progress and activities. Issue schedule at each regularly scheduled (OAC) 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. As the Work progresses, indicate Actual Completion percentage for each activity.

B. Distribution: Distribute copies of approved schedule to Architect and Owner, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

End of Section
01 33 00 Submittal Procedures

Part 1 – General

1.1 Summary
A. Section Includes:
   1. Subcontractors/materials list.
   2. Submittal schedule.
   3. Shop Drawings, Product Data, and Samples.

B. Related Sections:
   1. Section 01 29 00 - Payment Procedures: Applications for Payment and Schedule of Values.
   2. Section 01 31 20 – Project Management and Coordination: Coordination Drawings.
   3. Section 01 31 19 - Project Meetings.
   4. Section 01 32 00 - Construction Progress Documentation: Contractor’s Construction Schedule.
   5. Section 01 33 10 - Request for Electronic Data.
   6. Section 01 42 00- References: Permits.
   7. Section 01 77 00 - Closeout Procedures: Warranty and manufacturer's submittals and closeout submittals.

1.2 Subcontractors/Materials List
A. General: Promptly after Contract award, but not later than the Pre-Construction Conference specified in “Section 01 31 19 - Project Meetings,” submit a list of proposed subcontractors and materials.
   1. Provide the names and addresses of all subcontractors and special fabricators. Indicate the portions of work to be performed by each, and a preliminary value of the work of each.
   2. Subcontractors and suppliers named in the subcontractors/materials list will be approved or disapproved in accordance with the conditions of the Contract.

1.3 Submittal Schedule
A. Requirements: After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals in accordance with General Conditions. Submit the schedule within 10 days of the date required for establishment of the Contractor’s construction schedule.
   1. Schedule shall be an integral component of the Project Management Software described in “Section 01 32 00 - Construction Progress Documentation”.

B. Preparation: Prepare the schedule in chronological order. Provide the following information:
   1. Description of work and Section number.
   2. Scheduled date for the first submittal of each item.
   3. Submittal category (Shop Drawing, Product Data or Sample).
   4. Scheduled date for Architect’s final release or approval.
C. Distribution: Following response to initial submittal, print and distribute copies to the Architect, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Revise and reissue the schedule after each meeting or activity, where revisions have been recognized or made.

1.4 Shop Drawings, Product Data and Samples

A. General: Prior to submission to Architect, all Shop Drawings, brochures, Samples and other submissions shall be approved by the Contractor for compliance with the Contract Documents and shall be checked for quantity, size and dimensions by Contractor's personnel. Architect will answer questions raised by the Contractor or subcontractors and will make all determinations regarding quality of materials and equipment, arrangement, and color selections but will not be responsible for quantity, size or dimensional errors. In cases of omissions and obvious error, and in cases of conflict either between details on Contract drawings, or Specifications such questions shall be called to Architect's attention, and the Architect shall give prompt answers to such questions.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

C. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.

1. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
2. Allow not less than 7 working days for initial review. Allow additional time if submittal is voluminous or if processing must be delayed to permit coordination with subsequent submittals. The Architect will advise the Contractor when a submittal being processed must be delayed for coordination or because of volume of material to be reviewed.
3. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
4. If resubmittal is necessary, process the same as the initial submittal. Identify in writing any changes, which have been made other than those directed by markings by the Contractor, Architect, or Architect's consultant on the prior submittal.
5. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow 7 working days for initial review of each submittal.
6. Allow not less than 7 working days for processing each resubmittal.
7. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
8. Perform work for which Architect's approval of Shop Drawings, Product Data and Samples is required only with the use of such items, which have been approved.

D. Submittal Preparation: Identify each submittal with a permanent label, title block, or contractor's stamp. Include the following information:
1. Project name.
2. Date.
3. Name of Architect, Contractor and subcontractor.
4. Name of supplier and manufacturer, as applicable.
5. Number and title of appropriate Specification Section.
6. Drawing number and detail references, as appropriate.

E. Contractor's Review: The Contractor shall approve submittals as required by General Conditions prior to submission to the Architect, and shall stamp and initial each submittal as evidence of Contractor's review and approval. Submittals received without the Contractor's executed approval stamp will be returned by the Architect without action.

F. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a cover letter or transmittal form. Submittals received from sources other than the Contractor will be returned without action. All submittals shall be submitted electronically via email except for material required to be reviewed by the State Fire Marshal or submittals with large format sheets, i.e. structural shop drawings.

1. On the letter or transmittal record relevant information, requests for data, and deviations from Contract Document requirements, including minor variations and limitations.
2. Include Contractor's certification that information complies with Contract Document requirements.

G. Submittals for Architect's Information: Where Specifications require submittals “for record purposes”, “for information only”, or similar wording, submit two copies of required items. Such submittals will not be stamped or returned by the Architect.

H. Architect's Action: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked to indicate the action taken.

1. Allow 4-inch by 6-inch space to accommodate stamp.
2. Except for submittals for record, information or similar purposes, the Architect will review each submittal, mark to indicate action taken, and return promptly.
3. Architect's review and action on any submittal does not relieve Contractor from responsibility for compliance with Contract Documents requirements, unless deviation is approved in writing.

1.5 Shop Drawings

A. Format: Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Use of Architect's drawings or computer-generated information as Shop Drawings is expressly prohibited. Standard information prepared without specific reference to the Project is not considered Shop Drawings. Include the following information:

1. Dimensions.
2. Identification of products and materials included.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.
B. Submittal Copies: ELECTRONIC SUBMITTALS. Submit a PDF copy plus additional information necessary for Contractor’s distribution electronically (e-mail and/or disk). The Contractor shall also provide to the Architect a minimum of 3 hard copies of the submittal for all submittals that have a single sheet that is larger than 11” by 17”. The Architect will return all submittals electronically with electronically edited marked PDF with action taken and corrections or modifications required.

C. Distribution: Contractor shall make necessary distribution of each electronically reviewed submittal or printed copies from the returned electronic submittal. Distribute approved Shop Drawing documents as follows:
   1. Contractor’s file.
   2. Job site file.
   4. Subcontractors, suppliers, fabricators and installers, as needed.

D. Coordination Drawings: Special Shop Drawings to show the relationship of construction elements that require coordination during fabrication and installation to fit in the space available and to function as intended.
   1. Preparation of coordination drawings is specified in “Section 01 31 00 – Project Management and Coordination” and may include components previously shown in detail on Shop Drawings or Product Data.
   2. Coordination drawings may be prepared by the Contractor, or by an entity responsible for one of the elements involved, or by an entity engaged by the Contractor for the purpose.

1.6 Product Data

A. Format: Collect Product Data into a single submittal for each system and element of construction. Product Data includes printed information such as manufacturer’s product descriptions and installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves.
   1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information.
   2. Do not submit Product Data until compliance with the Contract Documents has been verified.

B. Submittal Copies: Submit one electronic copy plus additional copies necessary for Contractor’s distribution. The Architect will return the PDF electronically edited submittal marked with action taken and corrections or modifications required.

C. Distribution: Distribute copies of final Product Data same as specified for Shop Drawings.

1.7 Samples

A. Format: Submit physical Samples which are identical to the material or product proposed, for visual review of kind, color, pattern, and texture, and for evaluation of the actual component as delivered and installed.
   1. Architect will not review Samples for requirements such as composition, strength, material class or grade, and similar qualities not apparent upon visual examination.
2. Submit multiple units (not less than 3), to show approximate limits of expected variations in color, pattern, texture or other characteristics.

3. Refer to other Specification Sections for Samples that illustrate workmanship, fabrication techniques, and details of assembly, connections, operation and similar construction characteristics.

B. Preliminary Samples: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

   1. Remove or clearly identify choices, which are "extra cost" selections with respect to the Contract requirements.
   2. Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

C. Submittal Copies: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit three (3) sets; one will be returned marked with the action taken. Maintain approved Samples at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.

E. Field Samples: Field Samples (mock-ups) are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

   1. Where required, Field Samples are specified in individual specification Sections.
   2. Use confirming letters or transmittal forms to provide a record of activity.

F. Permanent Work: Items incorporated in the Work shall match approved Samples.

Part 2 - Products (Not Used)

Part 3 - Execution (Not Used)

End of Section
The above data sheets have been requested by the General Contractor in electronic format for its convenience and use in the preparation of shop drawings related to the subject project. The General Contractor agrees to pay the Architect a “service fee” charge of $100.00 per drawing and the use of these electronic files are subject to the following terms and conditions:

1. Annie P. Labruzzo Architect LLC files are compatible with select versions of Revit or AutoCAD. Annie P. Labruzzo Architect LLC does not make any representation that these files are compatible with the Contractor’s hardware or software beyond the specified release of the referenced software.

2. Data contained on these electronic files are considered a part of Annie P. Labruzzo Architect LLC’s Instruments of Service and shall not be used by the Contractor, or anyone else receiving this data through or from the Contractor, for any purpose other than as a convenience in the preparation of shop drawings for the referenced project. Any other use or reuse by the Contractor or by others will be at the Contractor’s sole risk and without liability or legal exposure to Annie P. Labruzzo Architect LLC, its officers, directors, employees, agents or subconsultants. To the fullest extent permitted by law, the Contractor agrees not to assert any claim and hereby waives any claim or cause of action of any kind or nature against Annie P. Labruzzo Architect LLC, its officers, directors, employees, agents or subconsultants which may arise out of or in conjunction with the Contractor’s use of these electronic files.

3. To the fullest extent permitted by law, the Contractor shall defend, indemnify and hold harmless Annie P. Labruzzo Architect LLC from all claims, damages, losses and expenses, including attorney’s fees, arising out of or resulting from Contractor’s use or reuse of these electronic files.
4. These electronic files are not construction contract documents. Significant differences may exist between these electronic files and corresponding hard copy construction contract documents due to addenda, change orders or other revisions. Annie P. Labruzzo Architect LLC makes no representation regarding the accuracy or completeness of the electronic files received. In the event that a conflict arises between the hard copy construction contract documents prepared by and signed and sealed by Annie P. Labruzzo Architect LLC and the electronic files, the signed and sealed hard copy construction contract documents shall govern. The Contractor is responsible for determining if any conflicts exist. By use of these electronic files, the Contractor is not relieved of their duty to fully comply with the contract documents, including without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions, and coordinate work with that of other contractors for the project.

5. Because of the potential that the information presented on the electronic files can be modified, unintentionally or otherwise, Annie P. Labruzzo Architect LLC reserves the right to remove all indicia of its authorship, firm identification and/or architectural seal for each electronic display.

6. Under no circumstances shall delivery of the electronic files for use by the Contractor be deemed a sale by Annie P. Labruzzo Architect LLC, and Annie P. Labruzzo Architect LLC makes no warranties, either expressed or implied, of merchantability and fitness for any particular purpose. In no event shall Annie P. Labruzzo Architect LLC be liable for any loss of profit or any consequential damages from the use or reuse of these electronic files.

The above represents the agreement between the Contractor and Annie P. Labruzzo Architect LLC with respect to the use of the subject electronic files.

The General Contractor acknowledges their agreement with the above by signing on the acceptance line below and returning this form, with payment of the service fee charge to the office of Annie P. Labruzzo Architect LLC.

Enclosed service payment: $_______00 associated with _____ Data Sheets @ $100.00 per sheet

ACCEPTED THIS _________ DAY OF ______________________, 20______.

________________________________________ ______________________________________
Signature       Title
Part 1 – General

1.1 Summary

A. Section Includes:

1. General definitions for Specifications and other Contract Documents including the Drawings.
2. Specification format and content explanation.
3. Explanation of Industry Standards.

1.2 Definitions

A. General: Basic Contract definitions are included in the General and Supplementary Conditions.

B. “Indicated”: Shown, noted, inferred, scheduled and specified on the Drawings and/or in Specifications.

C. “Regulations”: Laws, statutes, ordinances and lawful orders issued by authorities having jurisdiction.

D. “Furnish”: Supply and deliver to the project site.

E. “Install”: Unload, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean and perform similar operations at the project site.

F. “Provide”: Furnish and install, complete and ready for the intended use.

G. “Installer”: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

   1. The term experienced, when used with the term Installer, means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

   2. Trades: Using terms such as carpentry does not imply certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

   3. Assigning Specialists: Certain Sections of the Specifications require specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

      a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade union jurisdictional settlements and similar conventions.
H. “Project Site”: The space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.

I. “Testing Agencies”: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 Specification Format and Content Explanation

A. Specification Format: These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 48 Division format and the MASTERFORMAT numbering system.

B. Specification Content: This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are explained as follows:

1. Abbreviated Language: Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
   a. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

1.4 Industry Standards

A. Applicability of Standards: Except where Contract Documents include more stringent or specific requirements, industry standards, which are referenced in the Specifications are made a part of the Contract Documents and have the same force and effect as if bound or copied directly into Contract Documents.

1. Where requirements are expressed in SI (metric) units, it is understood that corresponding metric versions of industry standards, if available (such as ASTM A 36M for steel members or ANSI B18.22M for steel washers) will be the applicable standards.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. In complying with these requirements, indicated numeric values are minimum or maximum, as appropriate for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

C. Publication Dates: Where a date of issue or edition is not specified, comply with standard in effect on the date of Contract Documents.
D. Conflicting Requirements: Where compliance with 2 or more standards are specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and uncertainties to the Architect for a decision before proceeding.

1. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Architect for a decision before proceeding.

E. Copies of Standards: Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.

F. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Generally recognized acronyms or abbreviations are used in the Contract Documents.

**Part 2 – Products (Not Used)**

**Part 3 – Execution (Not Used)**

End of Section
01 45 00 Testing Laboratory Services

Part 1 – General

1.1 Related Documents
A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications Sections, apply to this Section.

1.2 Summary
A. Section Includes:
   1. Selection and payment.
   2. Contractor responsibility.
   3. Contractor cooperation.
   4. Additional tests.
   5. Rejection of materials.
   6. Test procedures.

B. Related Sections:
   1. Document - General Conditions: 13.03 Test and Inspections.
   2. Section 01 7780 - Closeout Procedures: Project record documents.
   3. Individual Specification Sections: Inspections and tests required, and standards for testing.

1.3 Selection and Payment
A. Selection and Payment: Architect shall recommend and the Owner shall select and pay for an independent Testing Laboratory of recognized standing for all testing hereinafter specified and/or required in the Contract Documents.

1.4 Contractor Responsibility
A. Contractor Responsibility: Employment of the Laboratory does not relieve the Contractor of responsibility to furnish materials and construction in conformance with the Contract Documents. Processing or use of specified materials shall constitute full acceptance and approval by the Contractor of materials as suitable for the intended purpose, unless the Contractor takes exception by writing to the Architect.

1.5 Contractor's Cooperation
A. Contractor's Cooperation: The Contractor shall cooperate with the Laboratory as follows:
   1. Make available, without cost, samples of all materials to be tested.
   2. Furnish nominal labor and sheltered working space as is necessary to obtain samples at the project.
   3. Advise the Laboratory of the identity of material sources and instruct the suppliers to allow tests or inspections by the Laboratory.
   4. Notify the Laboratory sufficiently in advance of operations to allow for completion of initial tests and assignment of inspection personnel.
5. Notify the Laboratory of cancellation of scheduled tests and inspections. The Contractor shall be responsible for paying Laboratory charges for canceled operations if timely notice was not given.

1.6 Additional Tests

A. Additional Tests: The Architect and Owner reserve the right to require additional tests to those specified or upon materials not already specified for testing. If such tests disclose noncompliance with the Contract requirements, the Architect and Owner reserve the right to require additional tests at the expense of the Contractor.

1.7 Rejection of Materials

A. Notification: The Laboratory shall notify the Contractor, or his authorized representative, of any materials or work which are not in full conformance with the Contract Documents and the Architect shall be informed of such notification. Such nonconforming items shall not be incorporated in the finished work unless changed or corrected.

Part 2 – Products (Not Used)

Part 3 – Execution

3.1 Test Procedures

A. Methods: Tests and inspections shall be conducted in accordance with the requirements of the Contract Documents or, if not specified therein, in accordance with the latest standards of ASTM, ACI, or other recognized authorities.

B. Reports: The Laboratory shall promptly submit written reports of each test and inspection to the Architect, Engineer, Owner, Contractor, suppliers of tested products, and to such other parties the Architect may specify.

End of Section
01 50 00 Temporary Facilities and Controls

Part 1 – General

1.1 Summary
   A. This Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
   B. Unless indicated to be optional, temporary services and facilities are Contract requirements.
   C. Relocate and rearrange temporary services and facilities as necessary for efficient, orderly progress of the work and to accomplish the required construction in stages as specified and indicated on the Drawings.

1.2 Definitions
   A. Permanent Enclosure: As determined by Architect, insulated, and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.3 Use Charges
   A. General: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner’s construction forces, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.
   B. Water Service: Water from Owner’s existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.
   C. Electric Power Service: Electric power from Owner’s existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 Submittals
   A. Implementation and Termination Schedule: Within 15 days of date established for submittal of Contractor’s construction schedule, submit a schedule indicating implementation and termination of each temporary utility.
   B. Site Utilization Plan: Submit a site utilization plan indicating locations of construction fencing, lay-down areas, vehicle circulation, and construction site entrances. Show temporary utility lines and connections.

1.5 Quality Assurance
   A. Regulations: Comply with industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:
      1. Authority having jurisdiction in the project location Parish/County, regulations and requirements.
      2. Building code requirements.
      3. Health and Safety regulations.
      4. Utility company regulations.
5. Police, fire department and rescue squad rules.

B. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 Project Conditions

A. Temporary Use of Permanent Facilities: The contractor shall assume responsibility for operation, maintenance, and protection of each permanent service during its use at the facility before Owner’s acceptance, regardless of previously assigned responsibilities.

B. Staging Areas: The Contractor and subcontractors shall locate offices, parking, materials storage, equipment storage and maintenance areas and similar major facilities in permitted areas directed by the Owner.

Part 2 – Products

2.1 Materials

A. First Aid Supplies: Comply with governing regulations.

B. Chain-Link Fencing: Minimum 6 feet (1.8 m) high.

2.2 Equipment

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

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 by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. 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: Install temporary service or connect to existing service.

   1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
   2. Contractor is responsible for providing any necessary temporary heating, cooling or ventilation necessary for construction operations.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

   1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
C. Water Service: Use of Owner’s existing water service facilities will be permitted, as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

1. Contractor shall provide piping, hoses, backflow preventers, valves and other items necessary to conduct water from connection point to the construction location.
2. Contractor shall supervise use of water to prevent waste and prevent damage to the building due to leaking and uncontrolled discharge.
3. Sterilize temporary water piping prior to use.
4. 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 for use of construction personnel. Comply with authorities having jurisdiction and health codes for type, number, location, operation, and maintenance of fixtures and facilities. Install where facilities will best serve the Project’s needs.

1. Comply with regulations and health codes for the operation and maintenance of fixtures and facilities.
2. Provide toilet tissue, paper towels and similar disposable materials for each facility within construction areas. Provide covered waste containers for used material.

E. Electric Power Service: Use of Owner’s existing electric power service will be permitted, as long as equipment is maintained in a condition acceptable to Owner.

1. Contractor shall provide extension cords, wiring, switches, disconnects, fuses, lamps and receptacles, and other items necessary to conduct electricity from connection point to the construction location.
2. Contractor shall supervise use of electricity to prevent waste and to prevent injury and damage to the building due to improper and unsafe use including but not limited to overloading and absence of grounding.

F. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

3.3 Support Facilities Installation

A. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

B. Parking: Use designated areas of Owner’s existing parking areas for construction personnel.

C. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

D. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. 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.

B. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

C. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Prohibit smoking in construction areas.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -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.

C. 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 property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

End of Section
01 60 00 Product Requirements

Part 1 – General

1.1 Summary

A. This Section includes:

1. Definitions.
2. Quality assurance.
3. Product delivery, storage, and handling.
4. Product selection procedures.
5. Hazardous materials.
6. Installation of products.

B. Related Sections include:

1. Section 01 4200 - References: Applicability of industry standards to products specified.
2. Section 01 6300 - Product Substitution Procedures: Requirements for substitution requests made after award of the Contract.

1.2 Definitions

A. Definitions: Terms used in the Drawings and Specifications such as “specialties”, “systems”, “structure”, “finishes”, and “accessories”, which are self-explanatory and have well recognized meanings in the construction industry are not changed by this Section.

1. Products: Items purchased for incorporation in the work, whether produced for the Project or taken from previously produced stock, including “materials”, “equipment”, “systems”, and similar terms.
2. Named Products: Items identified by manufacturer’s product name, make or model designation.
3. Materials: Products that are shaped, cut, worked, mixed, finished, fabricated, processed, or assembled to form a part of the work.
4. Equipment: Products with operational parts, whether motorized or manually operated, that usually, but not necessarily, requires service connections such as wiring or piping.

1.3 Quality Assurance

A. Source Limitations: To the fullest extent possible, provide all products of the same kind from a single source.

B. Compatibility of Options: When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with other products.

C. Labels and Nameplates: Unless required for evidence of compliance and to display essential operating data, labels and nameplates shall be concealed in the completed construction.

1. Labels: Where required for observation after installation, locate product labels on an accessible surface that is not conspicuous.
2. Equipment Nameplates: Provide a permanent nameplate on service connected or power-operated equipment. Locate on an easily accessible surface which is inconspicuous in occupied spaces. The nameplate shall contain essential operating data such as:

   a. Name of product and manufacturer.
   b. Model and serial number.
   c. Capacity.
   d. Speed.
   e. Ratings.

1.4 Product Delivery, Storage, and Handling

   A. General: Deliver, store and handle products in accordance with the manufacturer's recommendations. Prevent damage, deterioration, and loss, including theft.

   B. Delivery: Schedule delivery to avoid long-term storage at the site and to prevent overcrowding of construction and storage spaces.

      1. Deliver products to the site in the manufacturer's original packaging with labels and instructions for handling, storing, unpacking, protecting, and installing.

   C. Inspection: Inspect products upon delivery to ensure that they comply with requirements and are undamaged and properly protected.

   D. Storage: Store products at the site to facilitate inspection and measurement of quantity or counting of units.

      1. Store heavy products in a manner that will not endanger the supporting construction.
      2. Store products subject to damage by the elements above ground, under cover in a weathertight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

Part 2 – Products

2.1 General Product Requirements

   A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and (unless otherwise specified or permitted) previously unused.

      1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details for complete installation and for the intended purpose.
      2. Where available, provide standard product types that have been used successfully in similar situations.
      3. As specified in “Section 01 42 00 - References”, quantity or quality levels shown and specified represent minimum acceptable levels.

2.2 Product Selection Procedures

   A. Proprietary Specification Requirements: Where two or more products or manufacturers are named, provide one of the products indicated or an Architect-approved equal by Addendum prior to receipt of Bids in accordance with the Instructions to Bidders. No substitutions will be permitted after award of the Contract except as provided in “Section 01 63 00 - Product Substitution Procedures.”
1. Quality Standards: Proprietary specifications are used only to denote the quality standard of the products desired, and do not restrict Bidders to the specific brand, make, manufacturer or specification named. Proprietary specifications are used only to set forth and convey to prospective Bidders the general style, type, character, and quality of the products desired. Equivalent products will be acceptable, but only with written prior approval as described in the Instructions to Bidders.

B. Reference Standards Specification Requirements: Where products are specified in accordance with an established standard. Select any product that meets or exceed those standards.

C. Descriptive Specification Requirements: Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a manufacturer's name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

D. Performance Specification Requirements: Where Specifications require compliance with performance requirements, with or without use of a manufacturer's name, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. Appropriate overall performance of a product is implied where the product is specified for a specific application.

E. Compliance with Standards, Codes and Regulations: Where the Specifications require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified. Refer to “Section 01 42 00 - References” for additional provisions.

F. Visual Matching: Where Specifications require matching an established Sample, the Architect's decision will be final on whether a proposed product matches satisfactorily.

G. Visual Selection: Where specified product requirements include the phrase “...as selected from manufacturer's standard colors, patterns, textures...” or a similar phrase, the Architect will select the color, pattern, and texture.

2.3 Hazardous Materials

A. Hazardous Materials: No products containing asbestos shall be used in the construction.

Part 3 – Execution

3.1 Installation of Products

A. General: Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

1. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected.

B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, which do not conflict with requirements contained in Contract Documents. Obtain Architect's determination in case of apparent conflicts.

C. Preliminary Procedures: Inspect products immediately upon delivery and again prior to installation. Remove damaged and defective items from the Project.
   1. Verify measurements and dimensions, before starting each installation.

D. Protection: Install each component during weather conditions and Project status that will ensure against damage and deterioration.
   1. Protect products and adjacent construction during and after installation, until acceptance, to prevent damage, soiling and deterioration from subsequent operations, harmful exposure, and incompatible materials.
   2. Coordinate the erection of temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for those purposes.

E. Attachment: Where mounting heights are not indicated, install components at standard mounting heights recognized within the industry for the application indicated. Refer uncertain mounting height determinations to the Architect for decision.
   1. Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for thermal and building movement.

F. Replacement and Repair: Promptly remove damaged, defective, and nonconforming products and acceptably replace with new, conforming products.
   1. Subject to Architect's approval, damaged and defective products may be repaired to a condition equivalent to acceptable new condition. Products that cannot be satisfactorily repaired shall be removed and replaced without additional cost to the Owner.
   2. Replacement and repairs shall be performed by the party responsible for the original installation.

End of Section
01 63 00 Product Substitution Procedures

Part 1 – General

1.1 Summary
A. Section Includes: Administrative and procedural requirements for handling product substitutions during bidding and after award of the Contract.

B. Related Sections:
   1. Section 01 33 00 - Submittal Procedures: Requirements for submitting Submittal Schedule.
   2. Section 01 60 00 - Product Requirements: Requirements for product selection procedures.
   3. Section 01 63 10 - Substitution Request Form: Form to be used by Bidder/Contractor for submission of product substitutions before and after award of the Contract.

1.2 Limitations on Substitutions
A. Substitutions: Product substitutions will NOT be considered during the bidding period for this Contract unless the “Substitution Request Form” is submitted to the Professional of Record (POR) for review as included in this Project Manual as “Section 01 63 10”.

   1. Substitutions will be acceptable only if the proposed substitute meets all specified requirements, including the manufacturer’s specifications for the originally specified product, which were current on the date of the Contract Documents.
   2. Proposed substitutions must be approved by both the Architect and the Owner.
   3. Requests for substitutions may be considered or rejected at the discretion of the Owner or the Architect.
   4. By requesting a substitution, the Contractor warrants the following to the Owner and Architect:
      a. The proposed substitute is equal or superior in all respects, including warranties and guarantees, to the specified product or method.
      b. No additional costs to the Owner or change in time will be involved unless stated in the request.
      c. Necessary coordination with other work will be provided by the Contractor.

B. Exceptions: The following are not considered substitutions and are not subject to requirements specified in this section for substitutions:

   1. Revisions to Contract Documents requested by the Owner or Architect.
   2. Specified options on products and construction methods included in Contract Documents.

1.3 Submittals
A. Substitution Request Submittal: Requests for substitution will be considered only after compliance with the following:

   1. Submit 1 electronic (PDF) copy or 3 hard copies of each substitution request form (form shall be completed and signed).
   2. Identify the product, or the fabrication or installation method to be replaced, with references to Specification Section and Drawing numbers. Provide complete
documentation for the proposed substitution including the following information, as appropriate:
   a. Product Data, including manufacturer's printed recommendations for fabrication and installation.
   b. Samples, where applicable or requested.
   c. Comparison of the proposed substitution with significant qualities of the product originally specified. Significant qualities may include size, weight, durability, performance, and visual effect.
   d. Changes or modifications to other parts of the Work necessary to accommodate the proposed substitution.
   e. Effect on the Contractor's Construction Schedule and Contract Time.
   f. Cost information in accordance with procedures for Change Order proposals if change in the Contract Sum is involved.

1.4 Substitutions Requested During Bidding

A. No substitution will be considered prior to receipt of bids unless written request for approval has been received by the Architect at least 7 WORKING DAYS prior to the date for receipt of Bids. Such requests shall be submitted on the proper “Substitution Request Form” at the end of this Section and described in as much detail as is reasonable for review of request. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect’s decision of approval or disapproval of a proposed substitution shall be final.

   1. The request will be automatically rejected unless the following conditions are met:
      a. The request is submitted on the required “Substitution Request Form” included in these Specifications.
      b. Extensive revisions to Contract Documents are not required.
      c. Proposed changes are in keeping with the general intent of Contract Documents.
      d. The request is timely, fully documented, and properly submitted.

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

1.5 Substitutions Requested After Contract Award

A. Conditions: The Architect's and Owner's evaluation of substitution requests made after Contract is awarded may include the following considerations:

   1. The request is directly related to an “or equal” clause or similar language in the Contract Documents.
   2. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation, or other considerations of merit, offsetting additional responsibilities to the Owner, which may include additional compensation to the Architect for redesign and evaluation services, increased cost of other construction by the Owner or separate contractors, increased operating and maintenance costs, or similar considerations.
   3. The specified product or method of construction is not approved by a governing authority.
   4. The specified product or method of construction is not compatible with other materials.
   5. The specified product or method of construction cannot be coordinated with other materials.
   6. The specified product or method of construction cannot provide a warranty required by the Contract Documents.
7. The specified product or method of construction cannot be provided within the Contract Time. The request may not be considered if delay from use of the specified product or method results from failure to pursue the Work promptly or coordinate activities properly.

1.6 Response

A. Architect’s Action: Within one (1) week of receipt of the request for substitution, the Architect will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on a proposed substitution is not made within the allotted time, use the product or method specified. Acceptance during Construction Phase will be by Change Order if change in Contract Time or Contract Sum is involved. The request will be rejected unless the following conditions are met:

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of Contract Documents.
3. The request is timely, fully documented and properly submitted.

1.7 Submittals Required by the Contract Documents

A. Non-Complying Submittals: Requests for substitution must be in accordance with Paragraph 1.3 of this Section. The routine submittal of Shop Drawings, Product Data and Samples that represent construction not complying with the Contract Documents does not constitute a request for substitution.

B. Required Submittals: Submittals specified in this Section do not take the place of submittals required in the specification Section under which the substitution is proposed, unless exemption from further submittals is stated in the approval.

Part 2 – Products (Not Used)

Part 3 – Execution (Not Used)

End of Section – Form Follows
We believe that the following product is equal or superior to the specified product in appearance, durability, performance, and in every other respect, and we hereby submit it for your consideration as a substitute for the specified item for the above-mentioned project:

A. Proposed Substitution: ________________________________________________________________
   __________________________________________________________________________________

B. Reason for Substitution: ______________________________________________________________
   __________________________________________________________________________________

C. COSTS (Construction Phase Only - Provide complete breakdown of costs including the cost amount to be DEDUCTED from the Contract Sum if the proposal substitution is accepted. Include documentation for both materials and labor): _________________________________________________________
   __________________________________________________________________________________

D. SCHEDULE (Construction Phase Only - Describe substitution’s effect on construction schedule):
   __________________________________________________________________________________
   __________________________________________________________________________________

E. Supporting Data:
   1. Product Data: Attach complete technical data, including laboratory tests, if applicable.
   2. Installation: Include complete information on changes to Drawings and/or Specifications describing the steps that the proposed substitution will require for its proper installation.
   3. Samples: Submit with request all necessary samples and substantiating data clearly marked to prove equal quality and performance to that which is specified.
F. List ways in which the proposed substitution affects dimensions shown on Drawings:

__________________________________________________________________________________

__________________________________________________________________________________

G. List effects of proposed substitution on other trades:

__________________________________________________________________________________

__________________________________________________________________________________

H. List ways in which proposed substitution would be affected by applicable code requirements and agency approval:

__________________________________________________________________________________

__________________________________________________________________________________

I. List differences between proposed substitution and specified item:

__________________________________________________________________________________

__________________________________________________________________________________

J. Manufacturer’s warranties of the proposed and specified items are: Same ______ Different_______
   Explain: _________________________________________________________________________

K. List information on availability of maintenance service and source of replacement materials:

__________________________________________________________________________________

__________________________________________________________________________________

L. Certification of, and Assumption of Liability for, Equivalent Performance: The undersigned states that the function, appearance and quality of the proposed substitution is equivalent or superior to the specified item and is in full compliance with the Contract Documents and applicable regulatory requirements. NOTARIZATION IS REQUIRED FOR SUPPLIER DURING BIDDING PHASE. NOTARIZATION IS REQUIRED FOR BOTH SUPPLIER AND CONTRACTOR DURING CONSTRUCTION PHASE. FAILURE TO PROVIDE SIGNED AND NOTARIZED SUBSTITUTION REQUEST WILL RESULT IN AUTOMATIC REJECTION OF PROPOSED SUBSTITUTION.

___________________________________   _________________________________
Supplier      Signature

___________________________________   _________________________________
Telephone       Date

Signature must be by the person authorized to legally bind their firm to the above terms. Failure to provide a legally binding signature will result in rejection.

NOTARY: ___________________________

___________________________________   _________________________________
General Contractor      Signature

___________________________________   _________________________________
Telephone       Date

NOTARY: ___________________________
A/E’s REVIEW AND ACTION (to be filled-in by Architect/Engineer)

☐ Substitution Proposal Rejected because Not Complete
☐ Substitution Accepted
    By: _____________________________
☐ Substitution Accepted as Noted
    Date: _____________________________
☐ Substitution Rejected
    Remarks: _____________________________

_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

☐ Substitution Rejected Because Request Received Too Late

End of Document
Part 1 – General

1.1 Related Documents

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

1.1 Summary

A. Section Includes: Requirements for cutting and patching necessary to:

1. Make connecting portions of Work fit properly;
2. Prepare in-place construction to receive new Work;
3. Restore damaged and defective in-place construction.

B. Related Sections:

1. Section 01 32 00 – Construction Progress Documentation: Contractor's Construction Schedule.
2. Section 02 41 00 - Demolition: Demolition of selected portions of the existing buildings for alterations.
3. Divisions 2 through 48: Specific requirements and limitations applicable to cutting and patching various kinds of Work are included in the respective Sections.
4. Divisions 23 and 26 Sections: Requirements and limitations applicable to cutting and patching mechanical and electrical installations.

C. Related Requirements: Specific requirements and limitations applicable to cutting and patching various kinds of Work are included in the respective technical Sections.

1.2 Architect's Approval

A. Architect's Approval: Architect's approval is required prior to cutting and patching which (1) affects structural elements, (2) arises due to previously unknown conditions, and (3) affects visual effect and performance qualities of the completed construction.

1.3 Submittals

A. Cutting and Patching Proposal: Where approval for cutting and patching is required, request and obtain written approval before proceeding. Describe conditions making cutting and patching necessary and outline intended procedures.

1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building’s appearance and other significant visual elements.
3. Products: List products to be used and firms or entities that will perform the Work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect’s Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

B. Compliance: Approval by the Architect to proceed with cutting and patching does not waive the Architect’s right to later require complete removal and replacement of Work, which is not in compliance with Contract requirements.

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.

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.

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 Coordination

A. Coordinate all cutting and patching of the existing building and/or immediately adjacent to occupied areas of the existing building with the Owner.

B. Schedule this work with the Owner in advance to avoid disruption of occupancy.

1. Provide dust control temporary barriers and noise control as required by Owner or other Sections of the Work.

1.6 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: Match adjacent components. If identical materials are not available, use materials that match to the fullest extent possible and whose installed performance will equal or exceed that of original 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: Design and provide temporary support of work to be cut and adjacent components to remain.

B. Protection: Protect in-place construction during cutting and patching to prevent damage from operations or from weather exposure. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Coordination: Avoid interference with adjoining areas and 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 workmen to perform cutting and patching. Perform 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. Inspection: Before cutting, examine condition of adjacent surfaces and the work area. Take corrective action before proceeding if necessary to safely perform the work and prevent damage or dislocation of construction to remain.

C. 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: Cut using a cutting machine, such as an abrasive saw or a diamond core drill.
   4. 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.
5. Proceed with patching after construction operations requiring cutting are complete.

D. 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.
3. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

E. Fire Resistive Construction: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements of local building code, to resist passage of smoke and other gases, and to maintain original fire-resistance rating of construction penetrated.

F. Cleaning: Clean areas and spaces where cutting and patching are performed or used as access. Clean piping, conduit, and similar features before they are enclosed or concealed.

End of Section
01 74 23 Final Cleaning

Part 1 – General

1.1 Description of the Work

A. Work Included in This Section:

1. The Section specifies administrative and procedural requirements for final cleaning at Substantial Completion.
2. Special cleaning requirements for specific elements of the Work are included in appropriate Sections of Divisions 2 through 48.

B. Single Prime Contract:

1. The Contractor for General Construction is responsible for coordination of final cleaning.

C. Environmental Requirements:

1. Conduct cleaning and waste disposal operations in compliance with all laws and ordinances. Comply fully with federal and local environmental and anti-pollution regulations.
2. Burning or burying of debris, rubbish or other waste material on the premises shall not be permitted.

Part 2 – Products

2.1 Materials:

A. Cleaning Agents:

1. Use cleaning materials and agents recommended by the 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.

Part 3 – Execution

3.1 Final Cleaning:

A. General:

1. Employ experienced workers or cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a professional building cleaning and maintenance program. Comply with manufacturer’s instructions.
2. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion for the entire Project or a portion of the Project:
   a. Clean the Project site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste materials, litter and foreign substances. Sweep paved areas broom clean. Remove petrochemical spills, stains and other foreign deposits. Rake grounds that are neither planted nor paved, to a smooth even-textured surface.
3. Remove tools, construction equipment, machinery, and surplus material from the site.
4. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition.
5. Remove labels that are not permanent labels.
6. 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 show evidence of repair or restoration.
7. Carefully, remove all paint over “UL” and similar labels, including mechanical and electrical nameplates. All labels shall be like-new and readable.
8. Wipe surfaces of mechanical and electrical equipment, elevator equipment and similar equipment. Remove excess lubrication, paint and mortar droppings and other foreign substances.
9. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned out bulbs, and defective and noisy starters in fluorescent and mercury vapor fixtures.
10. Leave the Project clean and ready for occupancy.

End of Section
01 77 80 Project Closeout and Closeout Submittals

**Part 1 – General**

**1.1 Description of Work**

A. Work Included in This Section:

1. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
   a. Inspection procedures
   b. Project record document submittal
   c. Operating and maintenance manual submittal
   d. Submittal of warranties

2. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 48.

**1.2 Related Work:**

A. Section 01 33 00 – Submittal Procedures

B. Section 01 42 00 – References

C. Divisions 2 through 48

D. Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

**1.3 Substantial Completion:**

A. General:

1. The Work or designated portion thereof will not be considered suitable for Substantial Completion until all systems are operational as designed; all designated or required governmental inspections or certifications have been made and posted, designated instruction of Owner’s personnel in the operation of systems has been completed, and all final finishes are in place. The project shall be complete for the intended use. All final “As-Built” Surveys shall be completed by the surveyor as specified in Divisions 0 and 1.

2. As a further condition of Substantial Completion, the General Contractor shall certify that all remaining work will be completed within 30 consecutive calendar days following the Date of Substantial Completion, and the failure to do so shall automatically reinstate the provisions for liquidated damages due the Owner as contained elsewhere in the Agreement or as provided by law for such period of time as may be required by the General Contractor to fully complete the work whether the Owner has occupied the work or not.

3. Upon Substantial Completion of the Work or designated portion thereof and upon application by the General Contractor and recommendation by the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof as provided in the Contract Documents.
B. Forms:
   1. All forms to be used shall be American Institute of Architect (AIA) forms, unless noted otherwise.

C. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.
   1. The General Contractor considers the Work, or a portion thereof which the Owner agrees to with no separation, is substantially complete, the General Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the General Contractor to complete all Work in accordance with the Bidding and Contract Documents.
   2. Advise Owner of pending insurance change-over requirements
   3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
   4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates, and similar releases.
   5. Deliver tools, spare parts, extra stock, and similar items.
   6. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner’s personnel of change-over in security provisions.
   7. Complete start-up testing of systems, and instruction of the Owner’s operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
   8. Remove temporary facilities, construction equipment and temporary services. Restore disturbed items to original condition or better.
   9. Complete final cleanup requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.
   10. Submit an acceptable copy of the HVAC Test and Balance Reports.
   11. Submit all Final Inspections Certificates along with a Use and Occupancy Certificate.

D. Inspection Procedures:
   1. On receipt of a request for inspection for Substantial Completion, the Architect will either proceed with inspection or advise the General Contractor of unfilled requirements. The Architect will prepare the Certificate of Substantial Completion documentation following inspection or advise the General Contractor of construction that must be completed or corrected before the certificate will be issued.
   2. The Architect will repeat inspection when requested in writing by the General Contractor and assured that the Work has been substantially completed and all items that were incomplete have been corrected.
   3. Results of the completed inspection will form the basis of requirements for final acceptance.

E. Re-inspection Procedure:
   1. In the event that more than the two inspections by the Architect described above are made necessary by the failure of the General Contractor to complete the work, or to complete or correct items identified on the list of such items, the General Contractor shall reimburse the Owner for all costs incurred including the cost of the Architect’s services made necessary thereby.
2. Upon completion of re-inspection, the Architect will prepare Certificate of Substantial Completion documentation or advise the General Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for Substantial Completion.

3. If necessary, a CPR will be established for re-inspection and will be issued at the General Contractor’s expense with the amount deducted from his Application for Payment.

1.4 Final Acceptance:

A. At the completion of the Project prior to receiving final payment, the Contractor shall furnish the Owner, through the Architect, properly executed Clear Lien and Privilege Certificate for the Project. Also at the completion of the contract, the Contractor shall provide documentation for the signature of the Owner and Contractor signifying the completion of the contractual obligation and the cancellation of the contract. This documentation shall be filed by the Contractor with the Recorder of Mortgages and proof of contract cancellation provided to the Owner. Upon completion of these items, final payment shall be due to the Contractor.

B. Preliminary Procedures:

1. Before requesting final inspection for final payment, complete the following (list exceptions in the request):
   a. Submit a copy of the Architect’s final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Architect.
   b. Submit record drawings, maintenance manuals, final project photographs (if any), and similar final record information.
   c. Guarantees, Warranties and Bonds.
   d. Keys and Keying Schedule.
   e. Spare parts and Maintenance Materials.
   f. Certificate of Occupancy, if required.
   g. All remnants required by the Contract Documents.
   h. Any other items as required by the Architect and/or Owner.

1.5 Record Document Submittals:

A. General:

1. The Contractor shall record on the Record Drawings maintained at the site all changes and selections made during construction and shall locate by dimensions showing actual field measurements of all major items which will be concealed in the completed work. These items shall include underground site utilities such as pipe, conduit, storm drainage, sewer, gas, water, medical gases, oil, and telephone, etc. and items above hard ceilings such as pipe, etc. Elevations are to be established at fifty-foot intervals and that all changes in direction using benchmarks or finish floor elevations.

2. Dimensions are to be taken from the face of building lines to centerline of piping or conduit.

3. Where new lines cross existing installed lines, the location, size, and type of line crossed shall be accurately recorded.

4. Where tie-ins to existing floor lines are indicated the elevation of the tie-in point and dimensioned location shall be recorded.

5. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistant location; provide access to record documents for the Architect’s reference during normal working hours.
B. Record Drawings:

1. Record drawings shall be provided in the form of reproducible drawing sheets (reproducible bond) and reflect changes in the work and locations of concealed items for all trades including plumbing, mechanical, electrical, and general construction. Bond prints of the original contract documents may be purchased from the Architect at the Architect’s standard printing rate.

2. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown.

3. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

4. Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.

5. Note related Change Order numbers where applicable.

C. Record Specifications:

1. Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show variations in actual Work performed in comparison with the text of the Specifications and modifications.

2. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.

3. Upon completion of the Work, submit record Specifications to the Architect for the Owner’s records.

D. Shop Drawings:

1. Deliver General Contractor’s approved copy of all shop drawings submitted during the course of the project.

E. Miscellaneous Record Submittals:

1. Refer to other Specification Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Architect for the Owner’s records.

1.6 Maintenance Manual and Instructions:

A. General Contractor shall, prior to completion of Contract, deliver to the Architect three (3) hard copies of a manual and/or digital copy on thumb drive (format preference to be verified with Owner), assembled, indexed, and bound; presenting for the Owner’s guidance, full details for care and maintenance of mechanical, electrical, and other equipment included in Contract. Manuals shall include parts lists for each item of equipment furnished under the Contract.
B. General Contractor shall, for this manual, obtain from Subcontractors, literature of manufacturers relating to equipment, including motors; also furnish cuts, wiring diagrams, instruction sheets, and other information pertaining to same that will be useful to Owner in overall operation and maintenance. Include also, the name, address, and phone number of the nearest sales and service organization for each item.

C. General:

1. Organize each manual into separate Sections for each piece of related equipment.
2. Index all data as per the Table of Contents.
3. As a minimum each manual shall contain a title page, a table of contents, copies of Product Data, supplemented by drawings and written text, and copies of each warranty, bond and service Contract issued.

D. Binders:

1. Identify each binder on the front and spine, with the typed or printed title “OPERATION AND MAINTENANCE MANUAL”, Project title or name, and subject matter covered. Indicate the volume number for multiple volume sets of manuals.
2. The binders shall be hard-cover, three-ring notebook, 2" capacity, 11" x 8-1/2" with heavy duty rings. Provide the number of binders required to properly contain all information required.

E. Drawings:

1. Where drawings or diagrams are required as part of the manual, provide reinforced punched binder tabs on the drawings and bind in with the text.
2. Where oversize drawings are necessary, fold the drawings to the same size as the text pages and use as a fold-out.
3. If drawings are too large to be used practically as a fold-out, place the drawing, neatly folded, in the front or rear pocket of the binder. Insert a typewritten page indicating the drawing title, description of contents and drawing location at the appropriate location in the manual.

F. Protective Plastic Jackets:

1. Provide protective transparent plastic jackets designed to enclose diagnostic software for computerized electronic equipment if required.

G. Text Material:

1. Where written material is required as part of the manual use the manufacturer’s standard printed material, or if it is not available, specially prepared data, neatly typewritten, on 8-1/2" by 11", 20-pound white bond paper.
2. Such data called for under separate Sections of the Specifications, shall be included in the manual described in this Section.

H. Title Page:

1. Provide a title page in a transparent plastic protective jacket as the first sheet of each manual. Provide the following information:
   a. Subject matter covered by the manual.
   b. Name and address of the Project.
c. Date of submittal.
d. Name, address, and telephone number of the General Contractor.
e. Name and address of the Architect.
f. Cross reference to related systems in other operating and maintenance manuals.

I. Table of Contents:

1. After the Title Page, include a typewritten table of contents for each volume, arranged systematically according to the Project Manual format. Include a list of each product included, identified by product name or other appropriate identifying symbol and indexed to the content of the volume.
2. Where more than one volume is required to accommodate data for a particular system, provide a comprehensive table of contents for all volumes in each volume of the set.

J. General Information:

1. Provide a general information Section immediately following the Table of Contents, listing each product included in the manual, identified by product name. Under each product, list the name, address, and telephone number of the Subcontractor or installer, and the maintenance contractor. Clearly delineate the extent of responsibility of each of these entities. In addition, list a local source for replacement parts and equipment.

K. Product Data:

1. Where manufacturer’s standard printed data is included in the manuals, include only sheets that are pertinent to the part or product installed. Mark each sheet to identify each part or product included in the installation. Where more than one item in a tabular format is included, identify each item, using appropriate references from the Contract Documents. Identify data that is applicable to the installation and delete references to information that is not applicable.

L. Written Text:

1. Where manufacturer’s standard printed data is not available, and information is necessary for proper operation and maintenance of equipment or systems, or it is necessary to provide additional information to supplement data included in the manual, prepare written text to provide necessary information. Organize the text in a consistent format under separate headings for different procedures. Where necessary, provide a logical sequence of instruction for each operating or maintenance procedure.

M. Warranties, Bonds and Service Contracts:

1. Provide a copy of each warranty, bond or service contract in the appropriate manual for the information of the Owner’s operating personnel. Provide written data outlining procedures to be followed in the event of product failure. List circumstances and conditions that would affect validity of the warranty or bond.

1.7 Instructions:

A. The Owner’s delegated representative shall be given personal instructions by trained personnel, in the care, use, maintenance, and operation procedures for each item. This shall be done in accordance with, and in addition to, the above required manual.
B. Operating and Maintenance Instructions:

1. Arrange for each installer of equipment that requires regular maintenance to meet with the Owner’s personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer’s representatives. Include a detailed review of the following items:
   a. Maintenance manuals
   b. Record documents
   c. Spare parts and materials
   d. Tools
   e. Identification systems
   f. Control sequences

2. As part of instruction for operating equipment, demonstrate the following procedures:
   a. Start-up
   b. Shutdown
   c. Emergency operations
   d. Noise and vibration adjustments
   e. Safety procedures
   f. Economy and efficiency adjustments
   g. Effective energy utilization

C. Maintenance Procedures:

1. Provide information detailing essential maintenance procedures, including the following:
   a. Routine operations
   b. Trouble-shooting guide
   c. Disassembly, repair, and reassembly
   d. Alignment, adjusting, and checking

D. Operating Procedures:

1. Provide information on equipment and system operating procedures, including the following:
   a. Start-up procedures
   b. Equipment or system break-in
   c. Routine and normal operating instructions
   d. Regulation and control procedures
   e. Instructions on stopping
   f. Shut-down and emergency instructions
   g. Summer and winter operating instructions
   h. Required sequences for electric or electronic systems
   i. Special operating instructions

E. Servicing Schedule:

1. Provide a schedule of routine servicing and lubrication requirements, including a list of repaired lubricants for equipment with moving parts.

F. Controls:

1. Provide a description of the sequence of operation and as-installed control diagrams by the control manufacturer for systems requiring controls.
G. Coordination Drawings:
   1. Provide each General Contractor’s Coordination Drawings.
   2. Provide as-installed color-coded piping diagrams, where required for identification.

H. Valve Tags:
   1. Provide charts of valve tag numbers, with the location and function of each valve.

Part 2 – Products (Not Applicable)

Part 3 – Execution (Not Applicable)

End of Section
01 83 00 Construction Procedures

Part 1 – General

1.1 Contractor’s Conformance to the Rules
   A. The General Contractor shall monitor and enforce these rules on each subcontractor in his employ.
      1. The General Contractor shall provide a copy of these policies and procedures to each employee and subcontractor and shall conduct training sessions for every individual under his control who enters the job site unescorted.

1.2 Facility Operations and Procedures
   A. Contractor shall maintain an access route through the site for the Owners use at all times.
   B. The Contractor shall maintain an acceptable functional environment at all times throughout the entire facility.
   C. Do not block any required fire access to other facilities on site and building exits.
   D. Coordinate Progress Schedule with the Owner.

1.3 Protections
   A. The Contractor shall assume responsibility for the protection of all areas of work and shall provide and maintain all protections required. Contractor shall protect existing surfaces of the building and equipment, both interior and exterior, as required during the construction period. Provide necessary dust screens, drop cloths, and temporary walls and/or coverings as may be required for protection. Existing surfaces that are damaged due to construction shall be patched or replaced to original condition.

1.4 Parking
   A. The Contractor, his employees, subcontractors and suppliers shall park in designated areas only.
   B. The General Contractor shall respond within 18 hours of the time a complaint is registered against a vehicle to the office of the designated representative of the Owner.

1.5 Loading Zones
   A. The Contractor shall load and unload materials at a location determined in the construction documents. All packages shall be clearly labeled to avoid confusion with Owner’s deliveries.
   B. No unattended vehicles shall be left in a loading zone.
   C. No vehicle shall be parked in a loading zone.

1.6 Fire Lanes, No Parking Zones and Emergency Drives
   A. No parking or standing shall be allowed in Fire lanes, NO PARKING zones and emergency drives.

1.7 Use of Owner’s Toilet Facilities
   A. The Contractor and his forces shall not use the toilet facilities in the building.
B. The Contractor shall provide adequate temporary toilet facilities for all the work force throughout construction.

1.8 Soil, Dust and Cleaning

A. The Contractor shall keep a clean work area.

B. The Contractor shall continuously clean the areas outside the construction area.

C. The Contractor shall provide walk-off pads at each entrance/exit to any Construction Operation area, which potentially spreads dirt and dust into the facility.

Part 2 – Products (not used)

Part 3 – Execution (not used)

End of Section
01 92 00 Warranties and Bonds

Part 1 – General

1.1 Description of Work

A. Work Included in This Section:

1. This Section specifies general administrative and procedural requirements for warranties and bonds required by the Contract Documents, including manufacturer’s standard warranties on products and special warranties.
2. Specific requirements for warranties for the Work and products and installations that are specified to be warranted are included in the individual Sections of Divisions 2 through 48.
3. Certifications and other commitments and agreements for continuing services to Owner are specified in the Contract Documents.

B. Disclaimers and Limitations:

1. Manufacturer’s disclaimers and limitations on product warranties do not relieve the General Contractor of the warranty on the Work that incorporates the products, nor does it relieve suppliers, manufacturers, and subcontractors required to countersign warranties with the General Contractor.
2. At no time shall any warranties/guarantees be submitted to the Owner for this project which supersedes or voids any of the Owner’s rights as established by the State’s General Statutes for which the project is located.
3. Failure of the General Contractor and/or its suppliers, manufacturers, and its subcontractors to enter into such warranties as required by the Contract Documents shall be considered a breach of contract.

1.2 Warranty Requirements:

A. Related Damages and Losses:

1. When correcting warranted Work that has failed, remove, and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work. Do not reuse damaged materials.

B. Assignment:

1. All warranties/guarantees of any systems and products shall be assigned to the Owner.

1.3 Submittals:

A. Written Warranties:

1. The Architect’s Certificate of Substantial Completion designates a commencement date for warranties.
2. Prepare a written document utilizing the appropriate form, ready for execution by the General Contractor, or the General Contractor and subcontractor, supplier, or manufacturer.
3. Refer to individual Section of Division 2 through 16 for specific content requirements, and particular requirements for submittal of special warranties.
B. Form of Submittal:

1. At Final Completion compile three (3) copies of each required warranty and bond properly executed by the Contractor, or by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the Table of Contents of the Project Manual. Deliver all warranties to the Architect.

C. Reinstatement of Warranty:

1. When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement.
2. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

D. Replacement Cost:

1. Upon determination that work covered by a warranty has failed, replace, or rebuild the work to an acceptable condition complying with requirements of Contract Documents.
2. The General Contractor is responsible for the cost of replacing or rebuilding defective work regardless of whether the Owner has benefitted from use of Work through a portion of its anticipated useful service life.

E. Owner’s Recourse:

1. Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Owner can enforce such other duties, obligations, rights, or remedies.

F. Rejection of Warranties:

1. The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with the requirements of the Contract Documents.

Part 2 – Products (Not Used)

Part 3 – Execution

3.1 Forms for Warranties:

A. General Contractor and Manufacturer shall fill out forms attached to end of this document. Do not use forms included herein, however photocopies may be made.

End of Section – Forms Follow
General Building Guarantee

Date: ______________________________  
(Date of Substantial Completion)

State of: ______________________________

Parish of: ______________________________

The ________________________________ (Name of Contractor) hereby guarantees all products and workmanship incorporated in the ________________________________ (Name of Project) ______________________ (Location), against defect for a period of 12 months for the General Guarantee as set forth in the General Conditions. This guarantee is binding where defects occur due to normal usage conditions and does not cover willful or malicious damage, damage caused by acts of Nature, or other casualty.

Respectfully submitted this ________________ day of ____________________, 20__________

By: ____________________________________________  
(Name of Firm or Corporation making bid)

By: ____________________________________________  

Title: Owner, Partner, or Corp. President or Vice President

WITNESS:

_________________________________________________________________________  
(Proprietorship or Partnership)

ATTEST:

By: ____________________________________________  
(Surety Company)

Title: ____________________________________________

By: ____________________________________________  

Title: ____________________________________________

(Corp. Sec., or Assist. Sec.)

Title: ____________________________________________

By: ____________________________________________  

Title: ____________________________________________

(Attorney in Fact)

Name and Address of Surety Agency
**Watertightness Guarantee**

Date: ______________________________
(Date Project accepted by the Owner)

State of: ______________________________

Parish of: ______________________________

The __________________________________________ (Name of Contractor) for __________________ 
______________________________________ (Name of Project) ______________________ (Location) 
shall guarantee for a period of 24 months that the work of their Contract shall be **watertight and leak-proof** at every area, except where leaks can be attributed to damage to the Work by external forces beyond their control. They shall, immediately upon notification by the Owner of water penetration, determine the source of water penetration and, at their own expense, do any work necessary to make the Work of his Contract watertight and leak-proof. They shall also, at their own expense, repair or replace any other damaged material, finishes, and furnishings, damaged as a result of this water penetration.

Respectfully submitted this ________________ day of ____________________, 20__________

By: ____________________________________________
(Name of Firm or Corporation making bid)

By: ____________________________________________

Title: Owner, Partner, or Corp. President or Vice President

WITNESS:

_______________________________________________
(Proprietorship or Partnership)

ATTEST:       _______________________________________
By: ______________________________________ (Surety Company)

Title: ____________________________________ By: ____________________________________
(Corp. Sec., or Assist. Sec.)

Title: ____________________________________

(Attorney in Fact)

Name and Address of Surety Agency
02 41 19 Selective Demolition

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. Demolition and removal of selected portions of building or structure.
   2. Demolition and removal of selected site elements.
   3. Salvage of existing items to be reused or recycled.

B. Related Requirements:

   1. Section 01 11 00 "Summary of the Work" for restrictions on use of the premises, Owner occupancy requirements, and phasing requirements.
   2. Section 01 73 29 "Cutting and Patching" for cutting and patching procedures.

1.3 Definitions

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.4 Materials Ownership

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

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

   1. Carefully salvage in a manner to prevent damage and promptly return to Owner.
1.5 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.

1.6 Informational Submittals

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

B. Schedule of Selective Demolition Activities: Indicate the following:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's and other tenants' on-site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Coordination of Owner's continuing occupancy of portions of existing building.

C. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with Section 01 32 00 "Construction Progress Documentation." Submit before Work begins.

1.7 Closeout Submittals

A. Inventory: Submit a list of items that have been removed and salvaged.

1.8 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: It is not expected that hazardous materials will be encountered in the Work.
   1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.
E. Hazardous Materials: 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.

   1. Hazardous material remediation is specified elsewhere in the Contract Documents.
   2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
   3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

F. Storage or sale of removed items or materials on-site is not permitted.

G. 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.

1.9 Coordination

   A. Arrange selective demolition schedule so as not to interfere with Owner’s 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 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. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

   C. Steel Tendons: Locate tensioned steel tendons and include recommendations for detensioning.

   D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

   E. Survey of Existing Conditions: Record existing conditions by use of measured drawings, preconstruction photographs or video.

      1. Comply with requirements specified in Section 01 32 00 "Construction Progress Documentation."
2. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
3. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 Preparation

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 Utility Services and Mechanical/Electrical Systems

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. 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.
4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings 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. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
   c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
   d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
   e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
   f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
   g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.4 Protection

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
4. Cover and protect furniture, furnishings, and equipment that have not been removed.
5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 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. 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. Maintain fire watch during and for at least 1.5 hours after flame-cutting operations.
5. Maintain adequate ventilation when using cutting torches.
6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
9. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 23 "Final Cleaning."

B. Site Access and Temporary Controls: Conduct selective demolition and debris removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area on-site for the Owner.
4. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

E. 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.

3.6 Selective Demolition Procedures for Specific Materials
A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.7 Disposal of Demolished Materials
A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
   4. Comply with requirements specified in Section 01 74 23 "Final Cleaning."
B. Burning: Do not burn demolished materials.

3.8 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.

3.9 Selective Demolition Schedule
A. Remove: Refer to drawings for scope of work.
B. Remove and Reinstall: Existing doors located in demolished walls per documents.
C. Existing to Remain: Refer to drawings for scope of work.

End of Section
SECTION 033000 – CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Scope: The work included in this section of the specifications includes all labor, materials, equipment and services necessary for cast-in-place concrete including formwork, reinforcing, mix design, placement and finishes as indicated on the drawings and herein specified.

1.2 CAST-IN-PLACE CONCRETE includes:

A. Foundations.
B. Slabs on grade.
C. Under slab vapor barrier
D. Equipment pads and bases.

1. Include all concrete pads and supports for mechanical and electrical equipment where indicated. Unless otherwise indicated, provide 500 lbs. of reinforcing per cubic yard of concrete placed to the size required to support the equipment purchased.

1.3 RELATED SECTIONS include the following:

A. Division 2 Section "Cement Concrete Pavement" for concrete pavement and walks.

1.4 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

C. Laboratory Test Reports: From a qualified testing agency for concrete materials and mix design

D. Material Certificates: Signed by manufacturers and contractor certifying that each material item complies with or exceeds specified requirements. Provide certification from admixture manufacturer that chloride content complies with specifications.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed concrete Work 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.
B. Codes and Standards: Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.

1. American Concrete Institute (ACI) 301, “Specifications for Structural Concrete for Buildings”.
2. ACI 318-95, “Building Code Requirements for Reinforced Concrete”.

C. Concrete Testing Service: Employ an independent testing agency to perform material evaluation tests and to review and approve mix designs.

D. Materials and installed work may require testing and re-testing at any time during the progress of work. Re-testing and replacement of rejected materials shall be performed at the contractor’s expense.

E. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

B. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

C. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no metal closer than 1.5 inches (25 mm) to the plane of the exposed concrete surface.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.


C. Deformed-Steel Wire: ASTM A 496.

2.3 REINFORCEMENT ACCESSORIES
A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. For slabs on grade, use precast concrete blocks with the same compressive strength as specified for cast-in-place concrete.

B. Underslab Vapor Barrier: 15 mil Stego Wrap, or approved; maximum 0.012 perms; multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E 1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.

2.4 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I.

1. Use one brand of cement throughout project unless otherwise acceptable to architect/engineer.

B. Fly Ash: ASTM C 618, Class F.

C. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:

1. Class: Moderate weathering region, but not less than 5M.


E. Water: Potable and complying with ASTM C 94.

F. Admixtures: General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions.

G. Air-Entraining Admixture: ASTM C 260, Certified by manufacturer to be compatible with other admixtures.

H. Water-Reducing Admixture: ASTM C 494, Type A.

I. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

J. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

K. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.5 FIBER REINFORCEMENT

A. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

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

   a. Fibrillated Fibers:
      1) Fibermesh; Fibermesh, Div. of Synthetic Industries.
b. Monofilament Fibers:
   1) Fiberstrand 100; Euclid Chemical Co.
   2) Fibermix Stealth; Fibermesh, Div. of Synthetic Industries.

2.6 VAPOR RETARDERS

A. Vapor Retarder: 15 mil Stego Wrap, or approved; maximum 0.012 perms; multi-layer, fabric-, cord-, grid-, or aluminum-reinforced polyethylene or equivalent, complying with ASTM E 1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single ply polyethylene is prohibited.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

F. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.8 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.

B. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.

C. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
   1. Type: Class II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
   2. Type: Class I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
   3. Type: Class IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.9 CONCRETE MIXES

A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial batch or field experience methods as specified in ACI 301. For trial batch method, use an
independent testing agency acceptable to the Architect for preparing and reporting proposed mix designs.

B. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of Work. Do not begin concrete production until proposed mix designs have been reviewed by Architect.

C. Design mixes to provide normal weight concrete with the 28-day compressive strength as indicated on drawings.

D. Slump Limits: Proportion and design mixes to result in concrete slump at point of placement as follows.

1. Not more than 4 inches.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant, as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in Work.

2.10 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with requirements of ASTM C 94, and as specified.

B. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes, and when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes. Ice may be added to concrete so that delivery time can remain at 1-1/2 hours.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117. Provide concrete with surface irregularities, complying with the following ACI 34

1. Provide Class A, tolerances for concrete exposed to view.
2. Provide Class C, tolerances for other concrete surfaces.

B. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.

C. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

D. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
E. Chamfer exterior corners and edges as indicated using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

F. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

G. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor bolts, accurately located, to elevations required.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.

B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:

1. At least 70 percent of 28-day design compressive strength.

C. Comply with ACI 301-89 for shoring requirements.

3.4 VAPOR RETARDERS

A. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions. Lap joints at minimum of 6 inches and seal watertight by taping edges and ends.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder where occurs. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials that reduce or destroy bond with concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.

C. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.

D. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

E. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Comply with the provisions of ACI 304, “Guide for Measuring, Mixing, Transporting and Placing Concrete”, and as specified.

1. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

C. Deposit concrete in forms in horizontal layers no deeper than 24 inches (600 mm) and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.

1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete complying with ACI 309R.

2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Slope surfaces uniformly to drains where required.
4. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

F. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Use approved water reducing retarding admixture when required by high temperatures or other adverse paving conditions.

3.8 FINISHING FORMED SURFACES

A. Rough-Formed Finished: Provide a rough-formed finish on formed concrete surfaces not exposed to view in the finished Work or concealed by other construction. This is the concrete surface having texture imparted by form-facing material used, with tie holes and defective areas repaired and patched, and fins and other projections exceeding ¼ inch in height rubbed down or chipped off.

B. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar uniformed surfaces adjacent to formed surfaces, strike-off smoother and finish with a texture matching adjacent formed surfaces.

3.9 FINISHING FLOORS AND SLABS

A. General: Comply with ADA for acceptable finish tolerances and with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, and other bonded cementitious floor finishes.

C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing.

D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thick-set or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.10 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

3.11 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
   a. Water.
   b. Continuous water-fog spray.
   c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.
d. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer’s written instructions. Reccoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
e. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer’s written instructions. Reccoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect. Remove and replace concrete that cannot be repaired and patched to Engineer’s approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.2-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete but not less than 1 inch (25 mm) in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete’s durability and structural performance as determined by Architect.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to
blend into adjacent concrete. Proprietary underlayment compounds may be used when acceptable to Architect/Engineer.

4. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

3.13 QUALITY CONTROL TESTING DURING CONSTRUCTION

A. General: Employ a testing agency to perform tests and to submit test reports.

B. Sampling and testing for quality control during concrete placement shall include the following, as directed by Architect.

1. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.
2. Slump: ASTM C 143; one test at point of discharge for each day’s pour of each type of concrete, additional tests when concrete consistency seems to have changed.
3. Air Content: ASTM C 173, volumetric method for lightweight or normal weight concrete; ASTM C 231, pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete.
4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F (4 deg C) and below, when 80 deg F (27 deg C) and above, and one test for each set of compressive-strength specimens.
5. Compression Test Specimen: ASTM C 31, one set of four standard cylinders for each compressive-strength test, unless otherwise directed. Mold and store cylinders for laboratory-cured test specimens except when field-cured test specimens are required.
6. Compressive-Strength Tests: ASTM C 39; one set for each day’s pour exceeding 5 cu. yd. Plus additional sets for each 50 cu. yd more than the first 25 cu. yd of each concrete class placed in any one day; one specimen tested 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.

C. When frequency of testing will provide fewer than five strength tests for a given class of concrete, conduct testing from at least five randomly selected batches or from each batch if fewer than five are used.

D. Test results will be reported in writing to Architect, Structural Engineer, ready-mix producer, and Contractor within 24 hours after tests. Reports of compressive strength tests shall contain the Project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-day tests and 28-day test.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by shall not be used as the sole basis for acceptance or rejection.

F. Additional Test: The testing agency will make additional tests of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
END OF SECTION 033000
SECTION 051200 – STRUCTURAL STEEL

PART 1 - GENERAL

1.1 SUMMARY

A. Scope: The work included in this section of the specifications includes all labor, materials, equipment, and services necessary for furnishing and installing structural and miscellaneous steel as indicated on the drawings and as herein specified.

B. This Section includes structural steel and architecturally exposed structural steel.

1.2 PERFORMANCE REQUIREMENTS

A. Structural performance: Engineer structural steel connections required by the Contract Documents to be selected or completed by the fabricator to withstand design loadings indicated.

B. Engineering Responsibility: Engage a fabricator who utilizes a qualified professional engineer to prepare calculations, Shop Drawings, and other structural data for structural steel connections.

1.3 SUBMITTALS

A. Product Data for each type of product specified.

B. Shop Drawings detailing fabrication of structural steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.

2. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.

3. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tension, or tensioned shear/bearing connections.

4. Include Shop Drawings signed and sealed by a qualified professional engineer responsible for their preparation.

5. Structural steel, including chemical and physical properties.

6. Bolts, nuts, and washers, including mechanical properties and chemical analysis.

7. Shop primers.


1.4 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed structural steel work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Fabricator Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to fabricate structural steel without delaying the Work.

D. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the State of Louisiana and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for projects with structural steel framing that are similar to that indicated for this Project in material, design, and extent.

E. Welding Standards: Comply with applicable provisions of AWS D1.1 “Structural Welding Code - Steel.”

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver structural steel to Project site in such quantities and at such times to ensure continuity of installation.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.
   1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
   2. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.6 SEQUENCING

A. Supply anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, templates, instructions, and directions as required, for installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel Angles, Plates, and Bars: Carbon Steel - ASTM A36.
B. Steel channels, S, M and HP shapes: ASTM A572, Grade 50.
C. Steel W shapes: ASTM A572 or ASTM A992, Grade 50.
D. Cold-Formed Structural Steel Tubing: ASTM A500, Grade B.
E. Steel Pipe: ASTM A53, Type E or S, Grade B.
   1. Weight Class: Standard
F. Anchor Rods, Bolts, Nuts, and Washers:
   1. Anchor Bolts: ASTM A307
   2. Headed Bolts: ASTM A325, Type 1, heavy hex steel structural bolts and heavy hex carbon-steel nuts.
A. Interior unexposed structural steel that is not to receive sprayed-on fireproofing shall receive one shop coat of paint in accordance with Steel Structures Painting Council’s Painting System Guide No. 7.00 utilizing SSPC Paint 13 or Paint 15, Type I.

B. All exposed or visible structural steel not designated to be galvanized shall receive one or more coats of paint after fabrication in accordance with all requirements of the Steel Structures Painting Council’s requirements for Zone 1A for interior steel or Zone 1B for exterior steel. All such paints shall be compatible with the finish coat as specified in Division 9.

C. No paint shall be placed within two (2) inches of any steel surface that is to be field welded (except for joist seats and beam flanges where joist seats are to be welded) nor on the top flange of any beams that receive shear studs.

D. Members shown on the drawings to be galvanized and any other exterior lintels or members not designated to be painted that are exposed or in contact with exterior masonry shall be galvanized after fabrication in accordance with ASTM A123 "Standard Specification for Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled Steel Shapes, Plates, Bars, and Strip", latest edition.

E. Any steel that is to receive sprayed-on fireproofing shall be uncoated.

F. Any surface coating that is damaged shall be touched up to provide full coverage and protection.

2.3 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: Premixed, nonmetallic, non-corrosive, non-staining grout containing selected silica sands, Portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and a 30-minute working time.

2.4 FABRICATION

A. Fabricate and assemble structural steel in shop to greatest extent possible. Fabricate structural steel according to AISC specifications referenced in this Section and in Shop Drawings.

1. Mark and match-mark materials for field assembly.
2. Fabricate for delivery a sequence that will expedite erection and minimize field handling of structural steel.
3. Complete structural steel assemblies, including welding of units, before starting shop-priming operations.

B. Fabricate architecturally exposed structural steel with exposed surfaces smooth, square, and free of surface blemishes, including pitting, rust and scale seam marks, roller marks, rolled trade names, and roughness.

1. Remove blemishes by filling, grinding, or by welding and grinding, prior to cleaning, treating, and shop priming.
2. Comply with fabrication requirements, including tolerance limits, of AISC’s “Code of Standard Practice for Steel Buildings and Bridges” for architecturally exposed structural steel.

C. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded.

D. Finishing: Accurately mill ends of columns and other members transmitting loads in bearing.

2.5 SHOP CONNECTIONS

A. Shop install and tighten high-strength bolts according to RCSC’s “Specification for Structural Joints Using ASTM A325 or A490 Bolts.”

1. Bolts: ASTM A325 high-strength bolts, unless otherwise indicated.
2. Connection Type: Snug tightened, unless indicated as slip-critical, direct-tension, or tensioned shear/bearing connections.

B. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.

1. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of back-side welding on exposed steel surfaces. Grind smooth exposed fillet welds 1/2 inch (13 mm) and larger. Grind flush butt welds. Dress exposed welds.

2.6 SHOP PRIMING

A. Surface Preparation: Clean surfaces to be painted. Remove loose rust, loose mill scale, spatter, slag or flux deposits. Prepare surfaces according to SSPC Specifications as follows:

1. SSPC-SP3 “Power Tool Cleaning”.

2.7 GALVANIZING

A. Items shown on the plans to be galvanized and bolts for same shall be hot-dipped zinc coated after fabrications. Galvanizing shall be done in accordance with ASTM Serial Designation A123. Any zinc coating that is damaged shall be touched up with Galvacon as manufactured by Southern Coatings in accordance with the manufacturer’s recommendations.

2.8 SOURCE QUALITY CONTROL

A. Engage an independent testing and inspecting agency to perform shop inspections and tests and to prepare test reports.

1. Testing agency will conduct and interpret tests and state in each report whether test specimens comply with or deviate from requirements.

B. Correct deficiencies in or remove and replace structural steel that inspections and test reports indicate do not comply with specified requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before erection proceeds, and with the steel erector present, verify elevations of concrete and masonry bearing surfaces and locations of anchorages for compliance with requirements.

B. Do not proceed with erection until unsatisfactory conditions have been corrected.
3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place, unless otherwise indicated.

1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

B. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.

C. Splice members only where indicated.

3.4 FIELD CONNECTIONS

A. Install and tighten high-strength bolts according to RCSC’s “Specification for Structural Joints Using ASTM A325 or A490 Bolts.”

B. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.

3.5 QUALITY CONTROL

A. If applicable, the Contractor will engage an independent testing and inspection agency to inspect high-strength bolted connections and welded connections and to perform tests and prepare test reports.

1. Testing agency shall conduct and interpret tests, state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
3. Testing agency may inspect structural steel at plant before shipment.

B. Correct deficiencies in structural steel work that inspections and laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor’s ex-
pense, as necessary to reconfirm any noncompliance of original work and to show compliance of corrected work.

C. Shop-Bolted Connections: Inspect or test in accordance with AISC specifications.
   1. Verify that gaps of installed Direct Tension Indicators are less than gaps specified in ASTM F959, Table 2.

D. Shop Welding: Inspect and test during fabrication of structural steel assemblies, as follows:
   1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   2. Perform visual inspection of all welds.
   3. Perform tests of welds as follows.
      a. Ultrasonic Inspection: ASTM E164.

E. Field-Bolted Connections: Inspect in accordance with AISC specifications.

F. Field Welding: Inspect and test during erection of structural steel as follows:
   1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   2. Perform visual inspection of all welds.
   3. Perform tests of welds as follows:
      a. Ultrasonic Inspection: ASTM E164.

3.6 CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas using same material as used for shop painting.
   1. Apply by brush or spray to provide a minimum dry film thickness of 1.5 mils.

END OF SECTION 051200
05 12 13 Architecturally Exposed Structural Steel Framing

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 architecturally exposed structural steel (AESS).
   
   1. Requirements in Section 05 12 00 "Structural Steel" also apply to AESS.

B. Related Requirements:
   
   1. Section 05 12 00 "Structural Steel" for additional requirements applicable to AESS.
   2. Section 05 50 00 "Metal Fabrications" for steel lintels and shelf angles not attached to structural-steel frame not defined as structural steel.
   3. Section 09 99 00 "Painting and Coating" for surface preparation and priming requirements.

1.3 Definitions

A. AESS: Structural steel designated as "architecturally exposed structural steel" or "AESS" in the Contract Documents.

B. Category 1 AESS: AESS that is within 96 inches (2400 mm) vertically and 36 inches (900 mm) horizontally of a walking surface and that is visible to a person standing on that walking surface or is designated as "Category 1 architecturally exposed structural steel" or "AESS-1" in the Contract Documents.

1.4 Coordination

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

1.5 Action Submittals

A. Shop Drawings: Show fabrication of AESS components. Shop Drawings for structural steel may be used for AESS provided items of AESS are specifically identified and requirements below are met for AESS.
   
   1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
   2. Include embedment Drawings.
   3. Indicate welds by standard AWS symbols, distinguish between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
   4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections. Indicate orientation of bolt heads.
   5. Indicate exposed surfaces and edges and surface preparation being used.
6. Indicate special tolerances and erection requirements.

1.6 Informational Submittals
   A. Qualification Data: For Installer & fabricator.
   B. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.7 Quality Assurance
   A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD, or is accredited by the IAS Fabricator Inspection Program for Structural Steel (AC 172).
   B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.

1.8 Delivery, Storage, and Handling
   A. Use special care in handling to prevent twisting, warping, nicking, and other damage. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
      1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.9 Field Conditions
   A. Field Measurements: Where AESS is indicated to fit against other construction, verify actual dimensions by field measurements before fabrication.

Part 2 – Products

2.1 Bolts, Connectors, and Anchors
   A. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F 1852, Type 1, roundhead assemblies, consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.
      1. Finish: Mechanically deposited zinc coating.

2.2 Primer
   A. Low-Emitting Materials: Paints and coatings shall comply with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
   B. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.
   C. Etching Cleaner for Galvanized Metal: MPI#25.
2.3 Fabrication

A. Shop fabricate and assemble AESS to the maximum extent possible. Locate field joints at concealed locations if possible. Detail assemblies to minimize handling and to expedite erection.

B. In addition to special care used to handle and fabricate AESS, comply with the following:

1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, and roughness.
2. Grind sheared, punched, and flame-cut edges of Category 1 AESS to remove burrs and provide smooth surfaces and edges.
3. Fabricate Category 1 AESS with exposed surfaces free of mill marks, including rolled trade names and stamped or raised identification.
4. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.
5. Fabricate with piece marks fully hidden in the completed structure or made with media that permits full removal after erection.
6. Seal-weld open ends of hollow structural sections with 3/8-inch (9.5-mm) closure plates for Category 1 AESS.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Cleaning Corrosion-Resisting Structural Steel: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

E. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

   1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
   2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
   3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.4 Galvanizing

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.

   1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
   2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
   3. Galvanize lintels attached to structural-steel frame and located in exterior walls.

2.5 Shop Priming

A. Shop prime steel surfaces except the following:

   1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
   2. Surfaces to be field welded.
   3. Surfaces to be high-strength bolted with slip-critical connections.
   4. Surfaces to receive sprayed fire-resistive materials.
   5. Galvanized surfaces.
B. Surface Preparation for Nongalvanized Steel: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."

C. Preparing Galvanized Steel for Shop Priming: After galvanizing, thoroughly clean steel of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.

D. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

---

Part 3 – Execution

3.1 Examination

A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Examine AESS for twists, kinks, warping, gouges, and other imperfections before erecting.

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

3.2 Preparation

A. Provide temporary shores, guys, braces, and other supports during erection to keep AESS secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

1. If possible, locate welded tabs for attaching temporary bracing and safety cabling where they will be concealed from view in the completed Work.
2. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 Erection

A. Set AESS accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

1. Erect Category 1 AESS to the tolerances specified in AISC 303 for steel that is designated AESS.
B. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

3.4 Field Connections
A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
   1. Joint Type: Snug tightened
   2. Orient bolt heads in same direction for each connection and to maximum extent possible in same direction for similar connections.

3.5 Field Quality Control
A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect AESS as specified in Section 051200 "Structural Steel Framing." The testing agency is not responsible for enforcing requirements relating to aesthetic effect.
B. Architect will observe AESS in place to determine acceptability relating to aesthetic effect.

3.6 Repairs and Protection
A. Remove welded tabs that were used for attaching temporary bracing and safety cabling and that are exposed to view in the completed Work. Grind steel smooth.
B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A 780/A 780M.
C. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
   1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
D. Touchup Painting: Cleaning and touchup painting are specified in Section 09 90 00 "Painting and Coating."
E. Touchup Priming: Cleaning and touchup priming are specified in Section 09 90 00 "Painting and Coating."

End of Section
SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Framing with dimension lumber.
   2. Framing with engineered wood products.
   3. Wood blocking and nailers.
   5. Wood sleepers.
   6. Plywood backing panels.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product.
   1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
   2. Include data for fire-retardant treatment from treatment manufacturer and certification by treating plant that treated materials comply with requirements.

1.3 INFORMATIONAL SUBMITTALS

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

B. Evaluation Reports: For the following, from ICC-ES:
   1. Wood-preservative-treated wood.
   2. Engineered wood products.
   3. Shear panels.
   5. Powder-actuated fasteners.
   7. Metal framing anchors.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be properly packed and handled while in transit to the job site to prevent damage.
B. Stack lumber flat with spacing beneath and between each bundle to provide air circulation. Protect lumber 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. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, “FSC Principles and Criteria for Forest Stewardship.” for the following:

1. Dimension lumber framing.
2. Laminated-veneer lumber.
4. Rim boards.
5. Miscellaneous lumber.

B. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
3. Provide dressed lumber, S4S, unless otherwise indicated.

C. Maximum Moisture Content of Lumber: 15 percent for 2-inch nominal (38-mm actual) thickness or less, 19 percent for more than 2-inch nominal (38-mm actual) thickness unless otherwise indicated.

D. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.

1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA U1; Use Category UC2 for interior construction not in contact with the ground. Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

2. 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.

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

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

2.3 FIRE-RETARDENT-TREATED MATERIALS

A. General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction, and 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 and a smoke developed index of 450 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'-6" beyond the centerline of the burners at any time during the test.
   1. Use treatment that doesn’t promote corrosion to metal fasteners.
   2. Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D3201 at 92 percent relative humidity.

C. 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.

D. Mark fire-retardant-treated lumber with appropriate classification marking of qualified testing agency.

E. Application: Treat items indicated on Drawings, and the following:
   1. Plywood backing panels.
2.4 DIMENSION LUMBER FRAMING

A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.
   1. Application: Interior partitions not indicated as load-bearing.
   2. Species:
      a. Mixed southern pine; SPIB.
      b. Northern species; NLGA.
      c. Eastern softwoods; NeLMA.
      d. Western woods; WCLIB or WWPA.

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

C. Framing Other Than Non-Load-Bearing Interior Partitions: Any species and grade with a modulus of elasticity of at least 1,500,000 psi (10 350 MPa) and an extreme fiber stress in bending of at least 1000 psi (6.9 MPa) for 2-inch nominal (38-mm actual) thickness and 12-inch nominal (286-mm actual) width for single-member use.
   1. Application: Framing other than interior partitions not indicated as load-bearing.

2.5 ENGINEERED WOOD PRODUCTS

A. Engineered Wood Products, General: Products shall contain no urea formaldehyde.

B. Laminated-Veneer Lumber: Structural composite lumber made from wood veneers with grain primarily parallel to member lengths, evaluated and monitored according to ASTM D 5456 and manufactured with an exterior-type adhesive complying with ASTM D 2559.
   1. Extreme Fiber Stress in Bending, Edgewise: 2900 psi (20.0 MPa) for 12-inch nominal-(286-mm actual-) depth members.
   2. Modulus of Elasticity, Edgewise: 2,000,000 psi (13 700 MPa).

C. Rim Boards: Product designed to be used as a load-bearing member and to brace wood I-joists at bearing ends, complying with research/evaluation report for I-joists.
   1. Material: product made from any combination solid lumber, wood strands, and veneers.
   2. Thickness: 1-1/8 inches (28 mm).
   3. Provide performance-rated product complying with APA PRR-401, rim board plus grade, factory marked with APA trademark indicating thickness, grade, and compliance with APA standard.
2.6 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Furring.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber of any species.

C. For concealed boards, provide lumber with 15 percent maximum moisture content and the following species and grades:

1. Mixed southern pine; No. 2 grade; SPIB.

2.7 PLYWOOD BACKING PANELS

A. Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.8 FASTENERS

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

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.


C. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.

D. Screws for fastening to metal framing: Metal framing screws complying ASTM C1002, length as recommended by screw manufacturer for material being fastened.

E. Wood Screws: Wood screws complying with ANSI B18.6.1.

2.9 METAL FRAMING ANCHORS

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

B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

1. Cleveland Steel Specialty Co.
2. KC Metals Products, Inc.
3. Phoenix Metal Products, Inc.
4. Simpson Strong-Tie Co., Inc.
5. USP Structural Connectors.

C. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

   1. Use for interior locations unless otherwise indicated.

E. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
   1. Use for wood-preservative-treated lumber and where indicated.

2.10 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Glass-fiber-resilient insulation, fabricated in strip form, for use as a sill sealer; 1-inch (25-mm) nominal thickness, compressible to 1/32 inch (0.8 mm); selected from manufacturer's standard widths to suit width of sill members indicated.

B. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch (6.4 mm) thick, selected from manufacturer's standard widths to suit width of sill members indicated.

C. Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, butyl rubber compound, bonded to a high-density polyethylene film, aluminum foil, or spunbonded polyolefin to produce an overall thickness of not less than 0.025 inch (0.6 mm).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's WCD 1, “Details for Conventional Wood Frame Construction,” unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer’s written instructions. Install fasteners through each fastener hole.

E. Do not splice structural members between supports unless otherwise indicated.

F. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

G. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.

H. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
   1. NES NER-272 for power-driven fasteners.
   2. Table 2304.9.1, "Fastening Schedule," in ICC’s International Building Code.
   3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC’s International Residential Code for One- and Two-Family Dwellings.

3.2 PROTECTION

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

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 061000
Part 1 – General

1.1 Summary

A. This Section includes the following:

1. Plastic-laminate cabinets.
2. Plastic-laminate adjustable shelving.
3. Shop finishing of woodwork.
4. Quartz countertops
5. Hardware for cabinets and adjustable shelves.

B. Related Sections:

1. 06 10 00 Rough Carpentry

C. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips unless concealed within other construction before woodwork installation.

D. Hardware: Furnish all hardware for cabinets and adjustable shelves; shop-install mortise hardware. Furnish shelf brackets for field installation.

E. Verify Owner supplied equipment before final fabrication.

1.2 Submittals

A. Product Data: For quartz-surfacing material, cabinet hardware, and accessories and finishing materials and processes.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show location and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
2. Show locations and sizes of cutouts and holes for plumbing fixtures, grommets, faucets, soap dispensers, and other items installed in architectural woodwork.
3. Provide all equipment locations in coordination with casework on shop drawings.

C. Samples:

1. Plastic-laminates, for each type, color, pattern, and surface finish.
2. Exposed cabinet hardware, one unit of each type and finish.
3. Quartz-surfacing materials.

D. Provide samples of all material warranties.

E. Testing report certificates for epoxy surfaces shall meet or exceed specified requirements.

1.3 Quality Assurance

A. Installer Qualifications: Employs skilled installers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.
B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1. Company with at least one project in the past five years with value of woodwork within 20 percent of cost of woodwork for this Project.
2. Accredited participant in the specified certification program prior to the commencement of fabrication and throughout the duration of the project.

C. Quality Standard: Unless otherwise indicated, comply with AWI’s "Architectural Woodwork Quality Standards”.

D. Coordination: Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

E. Pre-installation Meeting: Convene a pre-installation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.4 Mock-Up

A. Mock-Up Stage 1: At the wood fabricator’s shop (if within a 60 mile radius of project site) or at a secure and properly conditioned location at or near the project site, provide mock-up of the following items:

1. Typical casework with laminate cabinets. Including one (1) low and one (1) upper cabinet minimum of 3 feet wide and solid surface counter. Solid surface mock-up shall include edging, integral bowls, seams, etc.
2. Approved mock-ups may become part of the completed Work if undisturbed at time of Substantial Completion.
3. Units will be examined to ascertain quality and conformity to AWI quality level standards and Specification requirements.
4. When accepted, mock-up will demonstrate minimum standard for the Work.

1.5 Project Conditions

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Field Measurements: Where woodwork is 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 woodwork by field measurements before being enclosed and indicate measurements on Shop Drawings.

Part 2 – Products

2.1 Materials

A. All Wood panel products shall be “No Added Urea Formaldehyde” (NAUF), no exceptions.

B. Wood Products:
   a. Plywood – Any softwood species complying with PS-1/ANSI A 199.1 standards;
      APA Interior Type, veneer core, B-B grade; 3/4-inch thick unless otherwise
      indicated. Provide exterior grade glue and plywood panels at all areas.

C. High-Pressure Decorative Laminate: NEMA LD 3, Grade GP-50 (min. 0.050 inch thick: for
   horizontal surfaces, and NEMA LD-3, Grade GP-28 (min. 0.028 inch thick) for vertical surfaces.

   1. Wilsonart (Basis-of-Design)
   2. Formica
   3. Prior approved equal.

D. Quartz Countertop:

   1. Unique pure natural quartz surface
   2. Manufactures: Subject to compliance with requirements, provide products by one of the
      following.
      a. Wilsonart Quartz (Basis-of-Design)
      b. Corian Quartz
      c. HanStone Quartz
      d. Approved equal.
   3. Physical Properties:
      b. Density (Hydrostatic scale) (ASTM C97) >2.1 g/cm³
      c. Tensile Strength (ASTM D638): 10,100 psi.
      d. Gloss % incident light reflected at 60deg – polished (Glossmeter) >= 47%min.
      f. Abrasion Resistance (ASTM C501) >100
      g. Surface Burning (ASTM E84): 17(Class A/1 Rating).

2.2 Cabinet Hardware and Accessories

A. General: Provide cabinet hardware and accessory materials associated with architectural
   woodwork.

B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, self-closing, heavy-duty
   170 degree opening angle.

C. Stainless Steel Pulls (Cabinets and drawers): Back mounted, Amerock Bar Pulls BP19011SS or prior
   approved equal.

D. Drawer Slides: BHMA A156.9, B05091.

   1. Blum heavy duty Tandem plus BLUMotion undermount drawer slides or equal-Side
      mounted and extending under bottom edge of drawer; full-extension type; soft closing;
      zinc-plated steel.
   2. Hanging File System: Provide Hafele Item No. 422.71.901 hanging file rail in aluminum
      with a satin silver finish. (Assure that drawer width accommodates a standard hanging
      file folder.)

E. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA
   A156.18 for BHMA finish number indicated.
1. Satin Stainless Steel: BHMA 630, unless noted otherwise.

F. For concealed hardware, provide manufacturer’s standard finish that complies with product class requirements in BHMA 156.9.

G. Provide rubber or resilient plastic disc type mutes at the corners of all cabinet doors and drawers.

2.3 Miscellaneous Materials

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, fire-retardant-treated, kiln-dried to less than 15 percent moisture content.

B. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

2.4 Fabrication

A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.

   1. Fabricate to AWI Premium quality standards.
   2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.

B. Shelving: 3/4-inch (19-mm) medium-density fiberboard shelving with plastic laminated finish with edge banding.

   1. Intermediate Support: Shelves spanning over 36-inches shall receive intermediate supports.

C. Concealed Support Brackets:

   1. Manufacturer: Rakks or prior approved equal.
   2. Product/Description:
      a. Inside Wall Flush Mount Support Bracket
      b. ADA-Compliant Vanity Support Bracket
      c. Concealed EH Countertop Support Bracket
      d. Other models as required to achieve intended design.

D. Plastic-Laminate Cabinets: Provide base and wall cabinets as indicated on the drawings. 

   **NOTE:** All cabinets at sink locations shall be constructed with plywood and plastic laminate.

   1. Quality Standard: Comply with AWI Section 400 requirements for Laminate cabinets.
   2. Grade: Premium
   3. AWI Type of Cabinet Construction: Flush overlay.
   4. Grain or Pattern Direction: Grain or Pattern Direction: vertically at all locations unless noted otherwise.
   5. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate over 3/4-inch Medium-Density Fiberboard as follows:
      a. Horizontal Surfaces Other Than Tops: Grade HGS.
      b. Post-formed Surfaces: Grade HGP.
      c. Vertical Surfaces: Grade HGS.
      d. Edges: 3mm edge banding matching laminate in color and pattern.
1) All edges must be free of delamination, bubbles, and all adhesive residues.

6. Materials for Semi-exposed Surfaces Other Than Drawer Bodies: Plastic Laminate, over 3/4-inch Medium-Density Fiberboard. To include, but not limited to the following:
   a. Interior shelving.
      1) Melamine Color: white
      1) All edge banding must be free of delamination, bubbles, and all adhesive residues.

7. Drawer Sides and Backs: High pressure decorative laminate on 7 ply veneer core substrate; all visible surfaces with drawer in normal open position, compatible with interior finish or solid hardwood lumber (minimum of 1/2-inch thick).
   a. Melamine Color: white

   a. Melamine Color: white

9. Sub-Base: To be separate and continuous (no cabinet body sides or supports to floor), water resistant (exterior grade) plywood with concealed fastening to cabinet bottom. Ladder-type construction, for front, back and intermediates, to form a secure and level platform to which cabinets attach.

10. Joinery for Case Body Members:
   a. Tops, Exposed Ends and Bottoms:
      1) Doweled, glued under pressure (approximately 4 dowels per foot of joint) to receive top and bottom. Drill holes in end panels for adjustable shelves 1-1/4-inch on center.
   b. Exposed End Corner Details and Face Frame Attachment:
      1) Non-mitered joints, i.e. 90 degree applications: butt joint glued under pressure (no visible fasteners).
   c. Cabinet Backs – Wall Hung: Wall hung cabinet backs must be relied upon to support the full weight of the cabinet and its anticipated load for hanging/mounting purposes. Hanging/mounting mechanisms should transfer load to case body members.
      1) Full overlay, plant-on backs: Minimum 3/4-inch thick exterior grade plywood attached with standard specified screws spaced minimum 3-inches on center. Edge of back should not be exposed on finished ends.
   d. Cabinet Backs – Floor Standing:
      1) Full overlay, plant-on backs: Minimum 3/4-inch thick exterior grade plywood attached with standard specified screws spaced minimum 3-inches on center. Edge of back should not be exposed on finished ends.

11. Drawer Construction Techniques and Supports:
   a. Multiple Dovetail (all corners), French Dovetail front/lock shoulder back, glued under pressure.
   b. Doweled, glued under pressure (minimum 32 mm dowel spacing to 4-inch high, 64 mm dowel spacing above 4-inches.

12. Drawer Hardware Static Load: Combination metal and roller bearing drawer slides. Provide within the premium grade requirements.

13. Adjustable Shelf Techniques and Support: Metal shelf standards (recessed flush) or multiple holes (minimum 5-mm diameter with pins).

14. Colors, Patterns, and Finishes: As indicated on the drawings.
15. Provide dust panels of 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers, unless located directly under tops.

E. Quartz Countertops: (Q-1)

1. Quartz Material Thickness: 0.7 inch (20.0 mm). Each corner of top shall not deviate more than plus or minus 1/32 inch from nominal.
2. Colors, Patterns, and Finishes:
3. Fabricate tops in one piece with shop-applied backsplashes and edges, unless otherwise indicated. Comply with quartz material manufacturer’s written recommendations for adhesives, sealers, fabrication, and finishing.
4. Polish all exposed edges and cutouts exposed in finished work.
5. Drill holes in countertops for plumbing fittings and soap dispensers in shop.
   a. Fabrication and Installation as recommended per solid-surfacing manufacturer.

2.5 Shop Finishing

A. Finish architectural woodwork at fabrication shop. Defer only final touchup, cleaning, and polishing for field work.

Part 3 – Execution

3.1 Installation

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and back-priming.

B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm). Shim as required with concealed shims.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners, and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk, and filled flush with woodwork and matching final finish if transparent finish is indicated.

F. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.
   1. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches (400 mm) o.c.

G. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Caulk space between backsplash and wall with sealant specified in Section 07 90 00 "Joint Protections (Sealants)."
H. Install each type of countertop (plastic laminated, solid-surface, quartz-surface) as recommended per manufacturers and industry standards.

3.2 Adjustment and Cleaning

A. Woodwork:

1. Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
2. Clean, lubricate, and adjust hardware.
3. Clean woodwork on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

B. Other Work: Clean surfaces soiled or marred by woodwork installation. Repair or remove and replace with new material items which are damaged or cannot be acceptably cleaned.

C. Protection: Provide temporary protection and maintain conditions that ensure that work is without damage or deterioration at time of Substantial Completion.

End of Section
06 46 00 Wood Trim

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. Exterior standing and running trim.
      2. Interior standing and running trim.
      3. Closet and utility shelving.
      4. Wood furring, blocking, shims, and hanging strips for installing woodwork items unless
         concealed within other construction before woodwork installation.
      5. Shop priming of wood trim.

   B. Related Requirements:
      1. Section 06 10 00 "Rough Carpentry" for wood furring, blocking, and shims required for
         installing wood trim and concealed within other construction before wood trim
         installation.

1.3 Action Submittals
   A. Product Data: For each type of product, finishing materials, and processes.
      1. Include data for fire-retardant treatment from chemical-treatment manufacturer and
         certification by treating plant that treated materials comply with requirements.

   B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale
      details, attachment devices, and other components.
      1. Show details full size.
      2. Show locations and sizes of furring, blocking, and hanging strips, including concealed
         blocking and reinforcement specified in other Sections.
      3. Apply WI Certified Compliance Program label to Shop Drawings.
      4. Apply AWI Quality Certification Program label to Shop Drawings.

   C. Samples for Initial Selection:
      1. Shop-applied transparent finishes.
      2. Shop-applied opaque finishes.
      3. PVC edge material.
      4. Thermoset decorative panels.

   D. Samples for Verification:
1. Lumber and panel products with shop-applied opaque finish, 5 inches (125 mm) wide by 12 inches (300 mm) long for lumber and for panels, for each finish system and color, with one-half of exposed surface finished.

1.4 Informational Submittals

A. Product Certificates: For the following:
   1. Composite wood and agrifiber products.
   2. Thermoset decorative panels.
   3. Adhesives.

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

C. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.

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. Installer Qualifications: Certified participant in AWI's Quality Certification Program.

C. 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.

1.6 Delivery, Storage, and Handling

A. Do not deliver wood trim until operations that could damage wood trim have been completed in installation areas. If wood trim must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.

1.7 Field Conditions

A. Environmental Limitations for Interior Work: Do not deliver or install interior wood trim until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.8 Coordination

A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that wood trim can be supported and installed as indicated.

Part 2 – Products

2.1 Wood Trim, General

A. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of wood trim indicated for construction, finishes, installation, and other requirements.
1. Provide labels from AWI certification program indicating that woodwork complies with requirements of grades specified.
2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with those selections and requirements in addition to the quality standard.

### 2.2 Interior Standing and Running Trim for Opaque Finish

A. Grade: Economy.

B. Regional Materials: Interior trim for opaque finish shall be manufactured within 500 miles (800 km) of Project site.

C. Certified Wood: Interior trim for opaque finish shall be certified as "FSC Pure" according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and FSC STD-40-004, "FSC Standard for Chain of Custody Certification."

D. Wood Species: Eastern white pine, sugar pine, or western white pine

### 2.3 Utility Shelving

A. Grade: Custom.

B. Shelf Material: 3/4-inch (19-mm) solid lumber panel product with solid-lumber edge.

C. Wood Species: Eastern white pine, sugar pine, or western white pine.

### 2.4 Wood Materials

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

   1. Do not use plain-sawn softwood lumber with exposed, flat surfaces more than 3 inches (75 mm) wide.
   2. Wood Moisture Content for Interior Materials: 5 to 10 percent.

### 2.5 Hardware and Accessories

A. Adjustable Shelf Standards and Supports: BHMA A156.9, B04071; with shelf rests, B04081.

B. Shelf Rests: BHMA A156.9, B04013; metal, two-pin type with shelf hold-down clip.

### 2.6 Miscellaneous Materials

A. Interior Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber kiln dried to less than 15 percent moisture content.

B. Provide self-drilling screws for metal-framing supports, as recommended by metal-framing manufacturer.

C. 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.

D. Adhesives: Do not use adhesives that contain urea formaldehyde.
E. Adhesives: Use adhesives that meet 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."

F. VOC Limits for Installation Adhesives and Sealants: Use products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
   1. Wood Glues: 30 g/L.
   2. Multipurpose Construction Adhesives: 70 g/L.
   3. Structural Wood Member Adhesive: 140 g/L.
   4. Architectural Sealants: 250 g/L.

2.7 Fabrication

A. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

B. Fabricate wood trim to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
   1. Edges of Solid-Wood (Lumber) Members: 1/16 inch (1.5 mm) unless otherwise indicated.
   2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).

C. Backout or groove backs of flat trim members and kerf backs of other wide, flat members except for members with ends exposed in finished work.

D. Assemble casings in shop except where shipping limitations require field assembly.

E. Assemble moldings in shop to maximum extent possible. Miter corners in shop and prepare for field assembly with bolted fittings designed to pull connections together.

2.8 Shop Priming

A. Interior Wood Trim for Opaque Finish: Shop prime with one coat of wood primer specified in Section 09 90 00 "Painting and Coating."

B. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim.

2.9 Shop Finishing

A. General: Finish wood trim at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

B. Finish Materials: Use finish materials that meet 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."

C. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood trim, as applicable to each unit of work.
1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood trim. Apply two coats to end-grain surfaces.

D. Opaque Finish for Interior Trim:
   1. Grade: Economy
   2. Finish: System – water-based latex paint
   3. Color: As selected by Architect from manufacturer's full range
   4. Sheen: Semigloss, 46-60 gloss units measured on 60-degree gloss meter per ASTM D 523.

Part 3 – Execution

3.1 Preparation
   A. Before installation, condition wood trim to average prevailing humidity conditions in installation areas.
   B. Before installing architectural wood trim, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 Installation
   A. Grade: Install wood trim to comply with same grade as item to be installed.
   B. Assemble wood trim and complete fabrication at Project site to the extent that it was not completed in the shop.
   C. Install wood trim level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
   D. Scribe and cut wood trim to fit adjoining work, reﬁnish cut surfaces, and repair damaged ﬁnish at cuts.
   E. Anchor wood trim to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing. Use ﬁne finishing nails or ﬁnishing screws for exposed fastening, countersunk, and ﬁlled flush with woodwork.
      1. For shop-ﬁnished items, use ﬁller matching ﬁnish of items being installed.
   F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 96 inches (2400 mm) long except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
      1. Fill gaps, if any, between top of base and wall with latex sealant, painted to match wall.
      2. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches (3 mm in 2400 mm).
   G. Touch up ﬁnishing work speciﬁed in this Section after installation of wood trim. Fill nail holes with matching ﬁller where exposed.
      1. Apply speciﬁed ﬁnish coats, including stains and paste ﬁllers if any, to exposed surfaces where only sealer/prime coats are applied in shop.
H. Refer to Section 099123 "Interior Painting" for final finishing of installed wood trim.

3.3 Adjusting and Cleaning

A. Repair damaged and defective wood trim, where possible, to eliminate functional and visual defects; where not possible to repair, replace wood trim. Adjust joinery for uniform appearance.

B. Clean wood trim on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

End of Section
07 21 00 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.

1.3 Action Submittals
A. Product Data: For each type of product.
   B. Low-emitting product certification.

1.4 Informational Submittals
A. Product Test Reports: For each product, for tests performed by a qualified testing agency.
   B. Evaluation Reports: For foam-plastic insulation, from ICC-ES.

1.5 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.

Part 2 – Products

2.1 Glass-Fiber Blanket
A. 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.
   3. Low Emitting: Complies with the testing and product requirements of the California Department of Public Health's (formerly, the California Department of Health Services') "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."

   B. Recycled Content of Insulation: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.

   C. Glass-Fiber Blanket, Unfaced 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.
1. Manufacturers
   a. CertainTeed Corporation
   b. Johns Manville
   c. Knauf Insulation
   d. Owens Corning

2.2 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 84.

Part 3 – Execution

3.1 Preparation
   A. Clean substrates of substances that are harmful to insulation, including removing projections
      capable of puncturing insulation or vapor retarders, or that interfere with insulation attachment.

3.2 Installation, General
   A. Comply with insulation manufacturer's written instructions applicable to products and
      applications.
   B. Install insulation that is undamaged, dry, and unsoiled.
   C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill
      voids with insulation. Remove projections that interfere with placement.
   D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths,
      and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or
      required to make up total thickness or to achieve R-value.

3.3 Installation of Insulation In Framed Construction
   A. 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 (2438 mm), support
         unfaced blankets mechanically and support faced blankets by taping flanges of insulation
         to flanges of metal studs.

3.4 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
Section Title 07 52 13 Modified Bituminous Membrane Roofing: Walkway Pads

Part 1 – General

1.1 Section Includes

A. Modified bituminous membrane roofing.

B. Walkway Pads

1.2 Related Sections

A. Section 02 41 19 Selective Demolition

B. Section 07 54 23 Thermoplastic Polyolefin (TPO) Membrane Roofing: Curb Flashing

1.3 References

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
   3. Roof Consultants Institute “Glossary of Building Envelope Terms.”


1.4 Design Criteria

A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

C. Installer shall comply with current code requirements based on authority having jurisdiction.

D. Wind Uplift Performance: Roofing system shall meet the intent of systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.

E. FMG Listing: Roofing membrane, base flashings, and component materials shall comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG’s “RoofNav” for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.

1.5 Submittals

A. Product Data: Manufacturer’s data sheets for each product to be provided.

B. Detail Drawings: Provide roofing system details and details of attachment to other work, including:
1. Membrane terminations.
2. Walkway pads.

C. Verification Samples: Provide for each product specified.

D. Installer Certificates: confirmation that installer is approved, authorized, or licensed by manufacturer to install roofing system.

E. Maintenance Data: Provide manufacturer’s current published maintenance program.

F. Guarantees: Provide manufacturer’s current guarantee specimen.

G. Roofing sub-contractor shall provide a copy of the final System Assembly Letter issued by roofing manufacturer indicating that the products and system to be installed shall be eligible to receive the specified manufacturer’s guarantee when installed by a certified contractor in accordance with the manufacturer’s application requirements, inspected and approved by the roofing manufacturer’s Technical Representative.

H. Prior to roofing system installation, roofing sub-contractor shall provide a copy of the Guarantee Application Confirmation document issued by roofing manufacturer indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

1.6 Quality Assurance

A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer’s product and who is eligible to receive the specified manufacturer’s guarantee.

B. Manufacturer Qualifications: Qualified domestic U.S. owned and based manufacturer that has accredited testing agency listing for roofing system identical to that used for this Project.

C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 329.

D. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.

E. Provide evidence of CERTA training for any installer of torch-applied modified bitumen membrane. Copies of certifications are required prior to award and shall be maintained on the jobsite for inspection at any time.

1.7 Delivery, Storage, and Handling

A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer’s name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 Project Conditions
A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer’s written instructions and guarantee requirements.

1.9 Guarantee
A. Provide manufacturer’s system guarantee.
B. Single-source special guarantee includes roofing membrane accessories, adhesives, walkway products, and other approved single-source components of roofing system marketed by the manufacturer.
C. Installer’s Guarantee: Submit roofing Installer’s guarantee, signed by Installer, covering work of this Section, including all components of roofing system, for the following guarantee period:
   1. Guarantee Period: Five years from date of Substantial Completion.
D. Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.
   1. Installer is responsible for coordinating with building owner’s representative to verify compliance.

Part 2 – Products

2.1 Walkways
A. Walkway Pads: Mineral-granule-surfaced, reinforced modified asphalt composition, slip-resisting pads, manufactured as a traffic pad for foot traffic provided by roofing system manufacturer, with a pad size of 32 inch x 32 inch x 1/4 inch thick.
   1. Johns Manville DynaTred Walkway (Basis of Design)
   2. W.R. Meadows Whitewalk Roof Traffic Pads
   3. Prior approved equal

2.2 Auxiliary Roofing Membrane - Bituminous
A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
B. Asphalt Primer: ASTM D 41. Basis of design: JM Asphalt or prior approved equal.
C. Asphalt Roofing Cement: ASTM D 4586, type I, asbestos free, general purpose mastic as required by roofing system manufacturer for application. Basis of design: MBR Utility Cement or prior approved equal.
D. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, one-part, asphalt-based, trowel-grade mastic, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of design: MBR Utility Cement or prior approved equal.
Part 3 – Execution

3.1 Examination
A. Examine substrates, areas, and conditions for compliance with the requirements affecting performance of roofing system.
B. Unacceptable substrates should be brought to the attention of the General Contractor and Project Owner’s Representative and shall be corrected prior to installation of roofing system.

3.2 Preparation
A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.
B. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
C. If applicable, prime surface of deck with primer at a rate recommended by roofing manufacturer and allow primer to dry.
D. Proceed with each step of installation only after unsatisfactory conditions have been corrected.

3.3 Walkway Installation
A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
   1. Sweep away loose aggregate surfacing and set walkway pads in additional flood coat of hot roofing asphalt.
   2. Over smooth or mineral-surfaced roofs, or prior to graveling, install walkway pads in either a full bed of manufacturer recommended adhesive. All four corners of each piece should be fully and firmly set prior to walking on the board.
   3. Leave a minimum of 1" (2.54 cm) open space in all directions between walkway pads to provide for drainage of the roofing system.
B. Walkway Cap Sheet Strips: Install roofing membrane walkway cap sheet strips over roofing membrane in cold-applied adhesive.
C. Roof-Paver Walkways: Install walkway roof pavers according to manufacturer’s written instructions in locations indicated, to form walkways.

3.4 Field Quality Control
A. Final Roof Inspection: Arrange for roofing system manufacturer's technical representative to inspect roofing installation on completion and submit report to Architect.
B. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
C. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
3.6 Protection and Cleaning

A. Protect roofing system from damage and wear during remainder of construction period.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

End of Section
07 54 23 Thermoplastic Polyolefin (TPO) Membrane Roofing: Curb Flashing

Part 1 – General

1.1 Section Includes

A. Adhered TPO membrane roofing system.
B. Mechanically fastened TPO membrane roofing system.
C. Induction welded TPO membrane roofing system.
D. Self-Adhered TPO membrane roofing system.
E. Cover board.
F. Roof insulation.
G. Vapor retarder.
H. Base sheet.
I. Substrate board.

1.2 Related Sections

A. Section 06 10 00 Rough Carpentry for wood nailers, curbs, and blocking.
B. Section 07 62 00 Sheet Metal Flashing and Trim.
C. Section 23 05 00 Heating, Venting, and Air Conditioning.

1.3 References

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:
   3. Roof Consultants Institute “Glossary of Building Envelope Terms.”

1.4 Design Criteria

A. Contractor shall coordinate with existing TPO roofing installer and roofing warranty provider prior to purchase and installation of TPO components for curb flashing:

   Roofing & Reconstruction Contractors of America (RRCA)
   1-877-240-7722

B. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.
C. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
D. Installer shall comply with current code requirements based on authority having jurisdiction.
E. Wind Uplift Performance: Roofing system shall meet the intent of systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE 7.
F. FMG Listing: Roofing membrane, base flashings, and component materials shall comply with requirements in FMG 4450 and FMG 4470 as part of a roofing system and that are listed in FMG’s “RoofNav” for Class 1 or noncombustible construction, as applicable. Identify materials with FMG markings.
G. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
   1. Exterior Fire-Test Exposure: Class [A] [B] [C]; UL 790, for application and roof slopes indicated.

1.5 Submittals
A. Product Data: Manufacturer’s data sheets for each product to be provided.
B. Detail Drawings: Provide roofing system details and details of attachment to other work, including:
   1. Base flashings and membrane terminations.
   2. Tapered insulation, including slopes.
   3. Crickets, saddles, and tapered edge strips, including slopes.
   4. Insulation fastening and adhesive patterns.
C. Verification Samples: Provide for each product specified.
D. Installer Certificates: confirmation that installer is approved, authorized, or licensed by manufacturer to install roofing system.
E. Maintenance Data: Refer to Johns Manville’s latest published documents on www.JM.com.
F. Guarantees: Provide manufacturer’s current guarantee specimen.
G. Roofing sub-contractor shall provide a copy of the final System Assembly Letter issued by Johns Manville Roofing Systems indicating that the products and system to be installed shall be eligible to receive the specified manufacturer's guarantee when installed by a certified JM contractor in accordance with our application requirements, inspected and approved by a JM Technical Representative.
H. Prior to roofing system installation, roofing sub-contractor shall provide a copy of the Guarantee Application Confirmation document issued by Johns Manville Roofing Systems indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

1.6 Quality Assurance
A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer’s product and who is eligible to receive the specified manufacturer’s guarantee.
B. Manufacturer Qualifications: Qualified domestic U.S. owned and based manufacturer that has accredited testing agency listing for roofing system identical to that used for this Project.
C. Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 329.
D. Test Reports:
   1. Roof drain and leader test or submit plumber’s verification.
   2. Core cut, if required.
   3. Roof deck fastener pullout test, if required.
E. Moisture Survey, if required:
   1. Submit prior to installation, results of a non-destructive moisture test of roof system completed by approved third party. Utilize one of the approved methods:
      a. Infrared Thermography
      b. Nuclear Backscatter
F. Source Limitations: Obtain all components from the single source roofing manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.
1.7 Delivery, Storage, and Handling

A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 Project Conditions

A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.
   1. Single-source special guarantee includes roofing membrane, base flashings, roofing membrane accessories, [roof insulation], [fasteners], [adhesives], [cover board], [substrate board], [vapor retarder], [base sheet], [walkway products], [manufacturer’s expansion joints], [manufacturer’s edge metal products], and other approved single-source components of roofing system marketed by the manufacturer.
   3. Contractor is required to list “INSERT FIRM NAME” as the Specifier/Consultant of record in the appropriate fields (“Specifier Account”) when applying for the manufacturer’s warranty.

B. Installer’s Guarantee: Submit roofing Installer’s guarantee, including all components of roofing system for the following guarantee period:
   1. Guarantee Period: [Two] [Five] years from date of Substantial Completion.

C. Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.
   1. Installer is responsible for coordinating with building owner’s representative to verify compliance.

Part 2 – Products

2.1 Curb Flashing:

A. Quality Assurance: Meets or exceeds the criteria for ASTM D 6878.

B. Materials: 60 mil (1.5 mm) thick, reinforced TPO (thermoplastic polyolefin) membrane, with an encapsulated edge.

C. Color: Match existing building standard.

D. Product:
   1. JM TPO Curb Flashing (Basis of Design)
   2. GAF EverGuard TPO 60 mil Membrane
   3. Prior approved equal.

2.2 Thermoplastic Polyolefin Roofing Membrane - TPO

A. Fabric-Reinforced Thermoplastic Polyolefin Sheet: ASTM D 6878, uniform, flexible sheet formed from a thermoplastic polyolefin, internally fabric or scrim reinforced. Basis of design: [JM TPO] [JM TPO FB 115] [JM TPO FB 135] [JM TPO FB 150] [JM TPO FB 175] [JM TPO SA 60]
   1. Membrane Thickness: 60 mils (1.52 mm), nominal
2. Fabric Fleece Backed Membrane Thickness: 60 mils (1.52 mm), nominal
3. Exposed Face Color: Match existing building standard
4. Self-Adhered Membrane Thickness: 60 mils (1.52 mm), nominal
   a. Exposed Face Color: Match existing building standard
   b. Serviceable Installation Temperature: 20°F (-7°C) and above.

2.3 Auxiliary Roofing Materials – Single Ply

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with membrane roofing.
   1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

B. Sheet Flashing: Manufacturer’s internally reinforced or scrim reinforced. Basis of design: JM TPO 60 mil
C. Sheet Flashing (Self-Adhered): 60 mil (1.5 mm) thick, manufacturer’s internally reinforced or scrim reinforced with weldable selvage edges on each side of roll, one encapsulated edge and self-adhering capabilities in a wide installation temperature range. Basis of design: JM TPO SA – Flashing Membrane
   1. Serviceable Installation Substrate Temperature: 20°F (-7°C) and rising.
D. Bonding Adhesive: Manufacturer’s standard bonding adhesive for membrane, and bonding adhesive for base flashings.
   1. Serviceable Installation Ambient Air Temperature: 25°F and rising
E. Flashing Adhesive: Manufacturer’s standard bonding adhesive for base flashings.
   1. Serviceable Installation Ambient Air Temperature: 25°F and rising.
F. Urethane Adhesive: Manufacturer’s two component no VOC urethane adhesive formulated to adhere fleece-backed membrane to substrate.
G. Urethane Adhesive: Manufacturer’s self-contained two-part, low-rise foam adhesive formulated to adhere fleece-backed membranes to substrate.
H. Self-Adhered Primer: One-part penetrating primer solution to enhance the adhesion of self-adhering membranes.
I. Roofing Asphalt: ASTM D 312-15, Type IV
J. Liquid Applied Flashing: Manufacturer’s single ply liquid and fabric reinforced flashing system created with a fleece polyester scrim and a two-component polyurethane-based liquid applied flashing material, consisting of a liquid resin and a curing agent.
K. Liquid Applied Flashing Primer: Manufacturer’s single ply liquid flashing primer.
L. Slip Sheet: Manufacturer’s recommended slip sheet, of type required for application.
M. Metal Termination Bars: Manufacturer’s standard predrilled stainless-steel or aluminum bars, with anchors.
N. Fasteners: Factory-coated steel fasteners and metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer.
O. Polymer Fasteners: Glass-reinforced nylon fasteners with ¼” square drive and 1” head with Galvalume-coated 2” metal stress plates, designed to lock into the fastener head. Fasteners designed for fastening roof insulation to substrate and furnished by roofing system manufacturer.
P. Induction Welding Plate: A round specially coated Galvalume® plate with a recessed center and raised flat bonding surface specifically designed for induction welding application.
Q. Miscellaneous Accessories: Provide all accessories to meet the roofing manufacturer’s guarantee requirements.

2.4 Cover Board: Match existing building standard.

2.5 Roof Insulation: Match existing building standard.

2.6 Tapered Insulation: Match existing building standard.

2.7 Insulation Accessories: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.
2.8 Vapor Retarder: Match existing building standard.

2.9 Base Sheet Material: Match existing building standard.

2.10 Substrate Board: Match existing building standard.

2.11 Edge Metal Components

A. Metal Edge System: Manufacturer’s factory fabricated metal edge system used to terminate the roof at the perimeter of the structure. Provide product from single-source roofing system supplier that is included in the roofing guarantee.

B. Metal Flashing Sheet: Metal flashing sheet is specified in Section 07 62 00 Sheet Metal Flashing and Trim.

Part 3 - Execution

3.1 Examination

A. Examine substrates, areas, and conditions for compliance with the requirements affecting performance of roofing system.
   1. General:
      a. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.
      b. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
   2. Wood Decks:
      a. Verify that wood decking is visibly dry and free of moisture.
      b. Verify that wood has ability to provide minimum fastener pull-out resistance.
         1) Provide documentation of pull-out resistance values in accordance with ANSI/SPRI FX-1 2016.
   3. Ensure general rigidity and proper slope for drainage.
   4. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units more than 1/16 inch (1.6 mm) out of plane relative to adjoining deck.

B. Unacceptable panels should be brought to the attention of the General Contractor and Project Owner’s Representative and shall be corrected prior to installation of roofing system.

3.2 Preparation

A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer’s written instructions.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

C. If applicable, prime surface of deck at a rate recommended by roofing manufacturer and allow primer to dry.

D. Proceed with each step of installation only after unsatisfactory conditions have been corrected.

3.3 Re-Roof Preparation

A. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.
   1. Remove an area no larger than can be re-roofed in one day.
C. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents, sumps and like components necessary for application of new membrane.
D. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.
   1. Install decking to match existing as directed by Owner’s Representative.
E. Raise (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
   1. Modify curbs as required to provide a minimum 8” base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
   2. Secure of flashing and install new metal counterflashing prior to re-installation of unit.
   3. Perimeter nailers shall be elevated to match elevation of new roof insulation.
F. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

3.4 Re-Cover Preparation

A. Prepare existing roof according to roofing system manufacturer’s written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.
B. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents, sumps and like components necessary for application of new membrane.
C. Disable existing roof membrane per manufacturer’s written instruction.
D. Remove existing membrane per manufacturer’s written instructions.
E. Remove and replace wet, deteriorated or damaged roof insulation and decking as identified in moisture survey.
F. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Install decking to match existing as directed by Owner’s Representative.
G. Raise, (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:
   1. Modify curbs as required to provide a minimum 8-inch base flashing height measured from the surface of the new membrane to the top of the flashing membrane.
   2. Secure top of flashing and install new metal counterflashing prior to re-installation of unit.
   3. Perimeter nailers shall be elevated to match elevation of new roof insulation.
G. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.
H. Install polyester slip sheet as a loosely laid single layer beneath new single ply membrane, side and end lapping each sheet a minimum of 3 inches (76.2 mm) and 6 inches (150 mm), respectively. Sheet may be tacked into place as deemed necessary.

3.5 Substrate Board Installation

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.
   1. Fasten substrate board to [top flanges of steel deck] [wood deck] to resist uplift pressure at corners, perimeter, and field of roof per roofing system manufacturer's written instructions.

3.6 Base-Sheet Installation

A. Install one lapped base sheet course and mechanically fasten to substrate per roofing system manufacturer's written instructions.
   1. Enhance fastening rate in perimeter and corner zones per code requirements, wind uplift system approvals or manufacturer’s guarantee requirements, whichever is more stringent.
B. Comply with roofing system manufacturer's written instructions for installing roof insulation.
3.7 Vapor-Retarder Installation

A. Install polyethylene-sheet vapor retarder as a loosely laid single layer over area to receive vapor retarder, side and end lapping each sheet a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively.
   1. Seal side and end laps.

C. Install 2 glass-fiber felt plies lapping each sheet 19 inches (483 mm) over preceding sheet. Embed each sheet in a solid mopping of hot roofing asphalt per manufacturer’s written instructions.

D. Install modified bituminous vapor retarder sheet per roofing manufacturer’s written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
   1. Unroll roofing membrane sheets and allow them to relax for minimum time required by manufacturer.
   2. Heat weld vapor retarder to substrate per roofing system manufacturer’s written instructions.
   3. Adhere vapor retarder in a full mopping of hot asphalt to substrate per roofing system manufacturer’s written instructions.
   4. Self-adhere vapor retarder to substrate per roofing system manufacturer’s instructions.

E. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
   1. Repair tears and voids in laps and lapped seams not completely sealed.

3.8 Insulation Installation

A. Coordinate installation of roof system components so insulation and cover board are not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer’s written instructions. Fill gaps exceeding 1/4 inch (6 mm) with like material.

E. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

3.9 Cover Board Installation

A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer’s written instructions for installing roof cover board.

C. Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer’s written instructions. Fill gaps exceeding 1/4 inch (6 mm) with cover board.
   1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.

D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.
   1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.
3.10 Roofing Membrane Installation, General
A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.
B. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
C. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
   1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation.
   2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
   3. Remove and discard temporary seals before beginning work on adjoining roofing.
D. Asphalt Heating: Heat roofing asphalt to temperature recommended by roofing manufacturer to flux modified membrane. Do not exceed roofing asphalt manufacturer's recommended temperature limits during roofing asphalt heating. Discard roofing asphalt maintained at a temperature exceeding finished blowing temperature for more than 4 hours.
E. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.11 Base Flashing Installation
A. Install sheet flashings and preformed flashing accessories and adhere to substrates per membrane roofing system manufacturer's written instructions.
B. Apply solvent-based bonding adhesive at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
C. Apply water-based bonding adhesive in two-sided application, at required rate, and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.
D. Self-Adhere membrane to smooth approved substrates, when substrate temperatures are 40°F (4.5°C) and rising.
   1. The use of SA Primer or SA LVOC Primer is required for flashing applications on curbs and parapet walls for temperatures between 40°F (4.5°C) and 20°F (-7°C).
   2. The use of SA Primer or SA LVOC Primer is required for flashing applications over approved substrates with a porous or rough surface, including: Dens Deck Prime, Dens Deck, DEXcell, concrete and smooth faces CMU.
F. Apply single ply liquid applied flashing system per manufacturer's written instructions.
G. Flash penetrations and field-formed inside and outside corners per manufacturer's installation instructions.
H. Clean seam areas and overlap and firmly roll sheet flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.
I. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.12 Edge Metal Installation
A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.
B. Provide edge details as indicated on the Drawings. Install in accordance with the membrane manufacturer's requirements and SMACNA's "Architectural Sheet Metal Manual."
C. Join individual sections in accordance with the membrane manufacturer's requirements and SMACNA's "Architectural Sheet Metal Manual."
3.13 Slip Sheet Installation
   A. Install polyester slip sheet as a loosely laid single layer above single ply membrane, per manufacturer’s written instructions.

3.14 Field Quality Control
   A. Owner or designated representative will provide on-site observation and inspection during installation.
   B. Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
   C. Final Roof Inspection: Arrange for roofing system manufacturer’s technical representative to inspect roofing installation on completion and submit report to Architect.
   D. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.
   E. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.15 Protection and Cleaning
   A. Protect roofing system from damage and wear during remainder of construction period.
   B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
   C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

End of Section
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. Manufactured through-wall flashing with snaplock receiver.
   2. Manufactured reglets with counterflashing.

B. Related Requirements:
   1. Section 06 10 00 Rough Carpentry for wood nailers, curbs, and blocking.
   2. Section 07 54 23 Thermoplastic Polyolefin (TPO) Membrane Roofing: Curb Flashing.
   3. Section 23 05 00 Heating, Ventilation, and Air Conditioning for equipment curb flashing.

1.3 Coordination

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 Preinstallation Meetings

A. Preinstallation Conference: Conduct conference at Project site
   1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
   3. Review requirements for insurance and certificates if applicable.
   4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 Action Submittals

A. Product Data: For each type of product.
   1. Include construction details, material descriptions, dimensions of individual components.

B. Shop Drawings: For sheet metal flashing and trim.
   1. Include plans, elevations, sections, and attachment details.
   2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details.
      Distinguish between shop- and field-assembled work.
   3. Include identification of material, thickness, weight, and finish for each item and location in Project.
   4. Include details for forming, including profiles, shapes, seams, and dimensions.
   5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
   6. Include details of termination points and assemblies.
   7. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counterflashings as applicable.
   8. Include details of special conditions.
   9. Include details of connections to adjoining work.
10. Detail formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches (1:10).

B. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory applied finishes.

C. Samples for Verification: For each type of exposed finish.
   1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
   2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.
   3. Unit-Type Accessories and Miscellaneous Materials: Full-size Sample.
   4. Anodized Aluminum Samples: Samples to show full range to be expected for each color required.

1.6 Informational Submittals

A. Qualification Data: For fabricator.

B. Product Certificates: For each type of coping and roof edge flashing that is FM Approvals approved.

C. Product Test Reports: For each product, for tests performed by a qualified testing agency.

D. Sample Warranty: For special warranty.

1.7 Closeout Submittals

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

1.8 Quality Assurance

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

   11. For copings and roof edge flashings that are FM Approvals approved, shop shall be listed as able to fabricate required details as tested and approved.

1.9 Delivery, Storage, and Handling

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 Warranty

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

   12. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:
      a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
      b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
      c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

   13. Finish Warranty Period: 20 years from date of Substantial Completion.
Part 2 – Products

2.1 Performance Requirements

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. FM Approvals Listing: Manufacture and install roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:
   1. Design Pressure: To match existing TPO roofing criteria.

E. Recycled Content of Steel-Sheet Flashing and Trim: Postconsumer recycled content plus one-half of pre-consumer recycled content not less than 25 percent.

F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
   1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

2.2 Sheet Metals

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated galvanized steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation prepainted by coil-coating process to comply with ASTM A 755/A 755M.
   1. Surface: Smooth, flat and with manufacturer's standard clear acrylic coating on both sides.
   2. Exposed Coil-Coated Finish:
      a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
   3. Color: As selected by Architect from manufacturer's full range.
   4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

2.3 Underlayment Materials

A. Felt: ASTM D 226/D 226M, Type II (No. 30), asphalt-saturated organic felt; nonperforated.

2.4 Miscellaneous Materials

A. General: Provide materials and types of fasteners protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal or manufactured item unless otherwise indicated.
B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.
   1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.
      a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
      b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
      c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.
   2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape ½ inch (13 mm) wide and 1/8 inch (3 mm) thick.

D. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

2.5 Manufactured Sheet Metal Flashing and Trim

A. Reglets: Units of type, material, and profile required, formed to provide secure interlocking of separate reglet and counterflashing pieces, and compatible with flashing indicated.
   1. Manufacturers:
      a. Cheney Flashing Company
      b. Fry Reglet Corporation
      c. Heckmann Building Products
      d. Prior approved equal.
   2. Material: Galvanized steel, 0.022 inch (0.56 mm) thick.
   3. Surface-Mounted Type: Provide with slotted holes for fastening to substrate, with neoprene or other suitable weatherproofing washers, and with channel for sealant at top edge.
   4. Accessories:
      a. Flexible-Flashings Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where Drawings show reglet without metal counterflashing.
      b. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing's lower edge.
   5. Finish: Mill

2.6 Fabrication, General

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
   1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
   2. Obtain field measurements for accurate fit before shop fabrication.
   3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.
   1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with butyl sealant concealed within joints.
   2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Retain option in first paragraph below if Project is FM Global insured or if FM Global requirements set a minimum installation standard. FM Global states that cleats (hook strips) for fascias "should be at least one gauge heavier than the fascia metal."

G. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

H. Do not use graphite pencils to mark metal surfaces.

2.7 Roof-Drainage Sheet Metal Fabrications

A. Built-in Gutters: Fabricate to cross section required, with riveted and soldered joints, complete with end pieces, outlet tubes, and other special accessories as required. Fabricate in minimum 96-inch- (2400-mm-) long sections. Fabricate expansion joints and accessories from same metal as gutters unless otherwise indicated.
   1. Fabricate gutters with built-in expansion joints and gutter-end expansion joints at walls.
   2. Fabricate from the Following Materials:
      a. Stainless Steel: 0.016 inch (0.40 mm) thick.

2.8 Steep-Slope Roof Sheet Metal Fabrications

A. Apron, Step, Cricket, and Backer Flashing: Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

B. Drip Edges: Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

C. Eave, Rake Flashing: Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

D. Counterflashing: Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

E. Flashing Receivers: Fabricate from the following materials:
   1. Galvanized Steel: 0.022 inch (0.56 mm) thick.

Part 3 – Execution

3.1 Examination

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.
   1. Verify compliance with requirements for installation tolerances of substrates.
   2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
   3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Overlap side edges not less than 3-1/2 inches (90 mm). Roll laps and edges with roller. Cover underlayment within 14 days.

3.3 Installation, General

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.

2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

3. Space cleats not more than 12 inches (300 mm) apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.

4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.

5. Torch cutting of sheet metal flashing and trim is not permitted.

6. Do not use graphite pencils to mark metal surfaces.

C. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

D. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet (3 m) with no joints within 24 inches (600 mm) of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with sealant concealed within joints.

E. Fasteners: Use fastener sizes that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

F. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

G. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch (25 mm) into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F (4 deg C).

2. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 "Joint Sealants."
3.4 Roof-Drainage System Installation

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Built-in Gutters: Join sections with joints sealed with sealant. Provide for thermal expansion. Slope to downspouts. Provide end closures and seal watertight with sealant.
   1. Install underlayment layer in built-in gutter trough and extend to drip edge at eaves and under underlayment on roof sheathing. Lap sides minimum of 2 inches (50 mm) over underlying course. Lap ends minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails. Install slip sheet over underlayment.

3.5 Roof Flashing Installation

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch (75-mm) centers.

C. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches (100 mm) over base flashing. Lap counterflashing joints minimum of 4 inches (100 mm). Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant unless otherwise indicated.

3.6 Wall Flashing Installation

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

3.7 Erection Tolerances

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet (6 mm in 6 m) on slope and location lines indicated on Drawings and within 1/8-inch (3-mm) offset of adjoining faces and of alignment of matching profiles.

3.8 Cleaning and Protection

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

End of Section
07 84 43 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. Section Includes:
   1. Joints in or between fire-resistance-rated constructions.
   2. Joints at exterior curtain-wall/floor intersections.

1.3 Action Submittals
A. Product Data: For each type of product.
B. Product Schedule: For each joint firestopping system. Include location, illustration of firestopping system, and design designation of qualified testing agency.
   1. Engineering Judgments: Where Project conditions require modification to a qualified testing agency’s illustration for a particular joint firestopping system condition, submit illustration, with modifications marked, approved by joint firestopping system manufacturer’s fire-protection engineer as an engineering judgment or equivalent fireresistance-rated assembly.

1.4 Informational Submittals
A. Qualification Data: For Installer.
B. Product Test Reports: For each joint firestopping system, for tests performed by a qualified testing agency.

1.5 Closeout Submittals
A. Installer Certificates: From Installer indicating that joint firestopping systems have been installed in compliance with requirements and manufacturer’s written instructions.

1.6 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 UL's "Qualified Firestop Contractor Program Requirements."

1.7 Project Conditions
A. Environmental Limitations: Do not install joint firestopping systems when ambient or substrate temperatures are outside limits permitted by joint firestopping system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
B. Install and cure joint firestopping systems per manufacturer’s written instructions using natural means of ventilation or, where this is inadequate, forced-air circulation.
1.8 Coordination

A. Coordinate construction of joints to ensure that joint firestopping systems can be installed according to specified firestopping system design.

B. Coordinate sizing of joints to accommodate joint firestopping systems.

Part 2 – Products

2.1 Performance Requirements

A. Fire-Test-Response Characteristics:
   1. Perform joint firestopping system tests by a qualified testing agency acceptable to authorities having jurisdiction.
   2. Test per testing standards referenced in "Joint Firestopping Systems" Article. Provide rated systems complying with the following requirements:
      a. Joint firestopping systems shall bear classification marking of a qualified testing agency.
         1) UL in its "Fire Resistance Directory."
         2) Intertek Group in its "Directory of Listed Building Products."

2.2 Joint Firestopping Systems

A. Joint Firestopping Systems: Systems that resist spread of fire, passage of smoke and other gases, and maintain original fire-resistance rating of assemblies in or between which joint firestopping systems are installed. Joint firestopping 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 joint firestopping systems with ratings determined per ASTM E 1966 or UL 2079.
   1. Manufacturers:
      a. Hilti, Inc.
      b. Tremco, Inc.
      c. 3M Fire Protection Products
   2. Fire-Resistance Rating: Equal to or exceeding the fire-resistance rating of the wall, floor, or roof in or between which it is installed.

C. Joints in Smoke Barriers: Provide fire-resistive joint systems with ratings determined per UL 2079 based on testing at a positive pressure differential of 0.30-inch wg (74.7 Pa).
   1. Manufacturers:
      a. Hilti, Inc.
      b. Tremco, Inc.
      c. 3M Fire Protection Products
   2. L-Rating: Not exceeding 5.0 cfm/ft. (0.00775 cu. m/s x m) of joint at both ambient and elevated temperatures.

D. Exposed Joint Firestopping Systems: 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:
Jefferson Parish Human Services Authority
Hurricane Repairs and Renovation Project
1500 River Oaks Road West, Elmwood, LA 70123

1. Architectural Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.


G. Accessories: Provide components of fire-resistive joint systems, including primers and forming materials, that are needed to install elastomeric fill materials and to maintain ratings required. Use only components specified by joint firestopping system manufacturer and approved by the qualified testing agency for conditions 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 the Work.

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

3.2 Preparation

A. Surface Cleaning: Before installing fire-resistive joint systems, clean joints immediately 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 elastomeric fill materials or compromise fire-resistive rating.

2. Clean joint substrates to produce clean, sound surfaces capable of developing optimum bond with elastomeric fill materials. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form-release agents from concrete.

B. Prime substrates where recommended in writing by joint firestopping 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.

3.3 Installation

A. General: Install fire-resistive joint systems 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 elastomeric fill materials during their application and in position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing elastomeric fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of fire-resistive joint system.
C. Install elastomeric fill materials for fire-resistive joint systems by proven techniques to produce the following results:

1. Elastomeric fill voids and cavities formed by joints and forming materials as required to achieve fire-resistance ratings indicated.
2. Apply elastomeric fill materials so they contact and adhere to substrates formed by joints.
3. For elastomeric 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. Joint Identification: Identify joint firestopping systems with legible metal or plastic labels. Attach labels permanently to surfaces adjacent to and within 6 inches (150 mm) of joint edge so labels are visible to anyone seeking to remove or joint firestopping system. 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:

2. Contractor’s name, address, and phone number.
3. Designation of applicable testing agency.
4. Date of installation.
5. Manufacturer’s name.
6. Installer’s name.

3.5 Field Quality Control

A. Inspecting Agency: Owner will engage a qualified testing agency to perform tests and inspections according to ASTM E 2393.

B. Where deficiencies are found or joint firestopping systems are damaged or removed due to testing, repair or replace joint firestopping systems so they comply with requirements.

C. Proceed with enclosing joint firestopping systems with other construction only after inspection reports are issued and installations comply with requirements.

3.6 Cleaning and Protection

A. Clean off excess elastomeric fill materials adjacent to joints as the Work progresses by methods and with cleaning materials that are approved in writing by joint firestopping system manufacturers and that do not damage materials in which joints occur.

B. Provide final protection and maintain conditions during and after installation that ensure joint firestopping 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
07 90 00 Joint Protections (Sealants)

Part 1 – General

1.1 Scope:

A. The scope of sealant materials in this project shall be as shown on drawings and as specified herein. It shall include all materials, equipment and labor as necessary for complete installation. Provide the forms and types of sealant as required for project specific adjoining joint materials (interior and exterior) for watertightness and/or airtightness.

1.2 Related Sections:

A. Section 05 12 13 Architecturally Exposed Structural Steel Framing
B. Section 06 40 23 Interior Architectural Woodwork
C. Section 08 12 13 Hollow Metal Frames
D. Section 08 56 59 Aluminum Interior Sliding Service Window
E. Section 08 80 00 Glazing
F. Division 9 Finishes
G. Division 15 Mechanical
H. Division 16 Electrical

1.3 Submittals:

A. Product Data: Submit manufacturer’s product specifications for each joint sealer product proposed, including instructions for joint preparation and sealer application.

B. Samples: Submit color selection charts and samples of colors for selection by Architect from manufacturer’s full color line.

C. Test Reports: Coordinate with Sections 07811 - Cementitious Spray-Applied Fire Resistive Materials (where applicable) and 07840 - Firestopping (where applicable). For record purposes, for fire-resistive sealants (when used), provide test reports by an independent testing agency to confirm required fire resistance rating.

D. Field Mock-Ups: Before starting permanent work, apply sealants to Architect selected joints for further verification of colors selected and to represent completed work for appearance, materials, and application.

1.4 System Description:

A. Design requirements:

1. Design number of joints and joint widths for maximum of ± 25% movement.
2. Design depth of sealant to be 1/2 width of joint.
   a. Maximum Depth: 1/2 inch
   b. Minimum Depth: 1/4 inch
   c. Maximum Recommended Width: 5/8 inches

1.5 Quality Assurance:

A. Installer Experience: Engage an Installer who has successfully completed within the last three (3) years at least three (3) joint sealer applications similar in type and size to that of this Project.
B. Single Source Responsibility: Obtain joint sealer materials from a single manufacturer for each different product required.

C. Performance: Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.6 Delivery, Storage, and Handling:

A. Deliver products in original factory packaging bearing identification of product, manufacturer, and batch number. Provide Material Safety Data Sheets for each product.

B. Store products in a location protected from freezing, damage, construction activity, precipitation, and direct sunlight per manufacturer’s recommendations.

C. Condition products to approximately 60°F to 70°F for use per manufacturer’s recommendations.

D. Handle products with appropriate precautions and care as stated on Material Safety Data Sheets.

1.7 Job Conditions:

A. The Installer must examine the joint surfaces and backing and their anchorage to the structure and the conditions under which the joint sealer work is to be performed and notify the General Contractor of conditions detrimental to the proper and timely completion of the work and performance of the sealers. Do not proceed with the sealant work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

B. Weather Conditions: Do not proceed with installation of sealants under adverse weather conditions or when temperatures are below or above manufacturer's recommended limitations for installation. Proceed with the work only when forecasted weather conditions are favorable for proper cure and development of high early bond strength. Wherever joint width is affected by ambient temperature variations, install elastomeric sealants only when temperatures are in the lower third of manufacturer’s recommended installation temperature range.

1.8 Warranty:

A. Provide manufacturer’s five (5) year standard material warranty.

B. Include coverage for replacement of sealant materials which fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure, provided sealant has been installed per manufacturer’s recommendations.

Part 2 – Products

2.1 Materials - General:

A. Colors: For exposed materials, provide color as selected by Architect from manufacturer's full color lines. For concealed materials, provide the natural color which has the best overall performance characteristics.

B. Compatibility: Before purchase of each required material, confirm its compatibility with each other adjoining material it will be exposed to in the joint system.

C. Formulation: Where one-part, two-part and multi-part sealants are specified for the same sealant type, Installer has the option of selecting from the kinds specified.
2.2 Manufacturers:

A. Approved Manufacturers, pending specific product approval by Architect, are as follows:

   1. BASF The Chemical Co.
   2. Dow Corning Corporation
   3. Tremco Manufacturing Co.
   4. Sika Chemical Corporation
   5. Specified Technologies Inc. (STI)
   6. Hilti
   7. Prior Approved Equal

2.3 Sealants:

A. Interior Sealants:

   1. Polyurethane Sealant: One component, high performance, non-priming, gun grade,
      elastomeric polyurethane sealant. Complying with ASTM C920, Type S, Grade NS, Class
      35; TT-S-00230C, Type II, Class A; USDA compliant; and UL classified. Sealants may
      include the following:
         a. MasterSeal NP 1 by BASF
         b. Dymonic by Tremco
         c. Prior Approved Equal

   2. Smoke and Acoustical Sealant: Acrylic latex sealant used in smoke rated partitions or
      joints and to prevent sound transmission through unprotected openings. Sealants may
      include the following:
         a. TremStop Smoke & Sound Sealant by Tremco
         b. SpecSeal Smoke N’ Sound Acoustical Sealant by Specified Technologies Inc (STI)
         c. CP 506 Smoke and Acoustic Sealant by Hilti
         d. Prior Approved Equal

   3. Silicone Sealant: Ultra low modulus, high performance, one component, moisture curing
      silicone sealant. Complying with ASTM C920, Type S, Grade NS, Class 100/50; TT-S-
      001543A, Class A; TT-S-00230C, Class A, Type II. Sealants may include the following:
         a. Spectrum 1 by Tremco
         b. 795 Silicone Building Sealant by Dow Corning
         c. Prior Approved Equal

2.4 Miscellaneous Materials:

A. Joint Cleaner: Provide the type of joint cleaning compound recommended by the sealant or
   caulking compound manufacturer for the joint surfaces to be cleaned.

B. Joint Primer/Sealer: Provide the type of joint primer/sealer recommended by the sealant
   manufacturer for the joint surfaces to be primed or sealed as required.

C. Bond Breaker Tape: Polyethylene tape or other plastic tape as recommended by the sealant
   manufacturer to be applied to sealant-contact surfaces where bond to the substrate or joint filler
   must be avoided for proper performance of sealant. Provide self-adhesive tape wherever
   applicable.

D. Sealant Backer Rod: Compressible closed cell rod stock of polyethylene; “Closed-Cell Backer Rod
   and Soft-Baker Rod” (Sonneborn Building Products), "Ethaform" (Dow Corning Corp.), "Minicel"
   (Haveq Industries) or prior approved equal; or open cell polyurethane (Denver Foam) or prior
   approved equal as recommended by the sealant manufacturer in published data.
Part 3 – Execution

3.1 Manufacturer's Instructions:

A. Comply with manufacturer’s printed instructions except where more stringent requirements are shown or specified and except where manufacturer’s technical representative directs otherwise.

3.2 Joint Preparation:

A. Examination: Examine joints indicated to receive joint sealers for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

1. Clean joint surfaces immediately before installation of sealant or caulking compound. Remove dirt, insecure coatings, moisture, and other substances which would interfere with bond of sealant or caulking compound.
2. Prime or seal the joint surfaces wherever shown or recommended by the sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.
3. Concrete, Stone, and Other Masonry:
   a. Clean by grinding, sandblasting, or wire brushing to expose sound surface free of contamination and laitance.
4. Wood:
   a. Clean new and weathered wood. Scrape away loose paint to bare wood. If coatings cannot be removed, test coverage to verify adhesion of sealant and consult with manufacturer for appropriate primer.
5. Metal:
   a. Remove scale, rust, and coatings from metal to expose bright white surface. Remove protective coatings as well as chemical residue or film.
   b. Aluminum Frames: Remove clear lacquer before application of joint sealants. If coatings cannot be removed, test coverage to verify adhesion of sealant and consult with manufacturer for appropriate primer.
   c. Prime the following surfaces with primer recommended by joint sealant manufacturer:
      1) Copper
      2) Stainless Steel
      3) Galvanized Steel
      4) Fluorocarbon (Kynar) Coatings
   d. Remove other protective coatings or finishes that could interfere with adhesion.

B. Priming:

1. Where circumstances or substrates require primer, comply with the following requirements:
   a. Apply primer full strength with brush or clean, lint free cloth. Apply primer to a light, uniform coating. Porous surfaces require more primer. Do not over apply. Do not apply primer onto surfaces of substrate.
   b. Allow primer to dry before applying joint sealants. Depending on temperature and humidity, primer will be tack free in 15 to 120 minutes.
   c. Prime and seal on same workday.

3.3 Installation:

A. General: Comply with joint sealant manufacturers' written installation instructions applicable to products and applications indicated, except where more restrictive requirements are specified.
B. Preparation: Application surfaces shall be sound, clean and dry at time sealants are applied.
   1. Prime surfaces, if recommended by sealant manufacturer, using recommended material.

C. Installation Standards: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

D. Backer Rods: Install sealant backer rod for sealants, except where shown to be omitted or recommended to be omitted by sealant manufacturer for the application shown. Backer rod shall be accurately positioned with the joint to establish and control the uniform designated thickness of the sealant.
   1. Exercise care in the installation of the joint backing to see that the backing is not set too far below the surface, thereby increasing the depth of the sealant.
   2. All joint backing shall be used 25-30%, as recommended by the sealant manufacturer, 30% under compression and care shall be taken that the backing is not stretched so that it will, at a later time, recover and damage the sealant applied over it.

E. Bond Breaker Tape: Install bond breaker tape wherever required by manufacturer's recommendations to ensure that elastomeric sealants will perform properly and when backer rod cannot be implemented.

F. Sealants: Install sealants to depths as shown, as recommended by the sealant manufacturer but within the following general limitations, measured at the center (thin) section of the bead:
   1. For normal moving joints sealed with sealants, fill joints to a depth equal to 50% of joint width, but neither more than 1/2" deep nor less than 1/4" deep.

G. Apply sealant with sufficient pressure to completely fill the void space and to assure complete wetting of contact area to obtain uniform adhesion. During the application, keep the tip of nozzle at the bottom of joint, forcing sealant to fill from bottom to top. Move tip along joint at a rate as to completely fill the joint. Tool all caulking smooth and flush with adjacent surfaces unless detailed to be finished below the surface.

H. Spillage: Do not allow sealants or compounds to overflow or spill onto adjoining surfaces or to migrate into the voids of adjoining surfaces. Clean the adjoining surfaces by whatever means may be necessary to eliminate evidence of spillage.

3.4 Interior Caulking – Shall Include, But Not Be Limited To, The Following:

A. Door Frames: Caulk perimeter joints of frames set in wall construction.
B. Windows: Caulk at perimeter of windows, storefront, etc. set in exterior and interior walls.
C. Interior Joints: Joints and gaps formed by the intersection of dissimilar finishes and materials.
D. Casework: Caulk at contact with wall construction where gaps occur with fungicidal, mildew-resistant silicone by approved manufacturers listed herein, or prior approved equal.
E. Janitor’s Sinks, Restroom Fixtures, and Water coolers: Caulk at contact with wall and floor construction with fungicidal, mildew-resistant silicone by approved manufactures listed herein, or prior approved equal.

3.5 Cure, Protection and Cleaning:

A. Cure sealants and caulking compounds in compliance with manufacturer’s instructions and recommendations to obtain high early bond strength, internal cohesive strength and surface durability.
   1. Advise the General Contractor of procedures required for the cure and protection of sealants during the construction period so that they will be without deterioration or damage (other than normal wear and weathering) at the time of Owner's acceptance.
B. Remove excess sealants and sealant smears as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.
   1. Remove and replace other materials which cannot be satisfactorily cleaned.
C. Repair, remove or replace, other work damaged by joint sealer work and cleaning.

3.6 Quality Control:

A. Standard Field Adhesion Test:
   1. The field adhesion test is a simple screening procedure that may help detect application problems such as improper cleaning, use of improper primer, poor primer application or improper joint configuration. As a check for adhesion, a simple hand pull test is required at the job site after the sealant is fully cured (usually within 7 to 21 days). Field adhesion testing should be documented using the field Adhesion Testing Log. It is suggested that 5 tests for the first 300 meters (1000 feet) and one test per 300 meters (1000 ft) thereafter be submitted or one test per floor per elevation. The hand pull test procedure is as follows:
      a. Make a knife cut horizontally from one side of the joint to the other.
      b. Make two vertical cuts (from the horizontal cut) approximately 75 mm (3 in.) long, at both sides of the joint.
      c. Place a 25 mm (1 in.) mark on the sealant tab.
      d. Grasp 50 mm (2 in.) piece of sealant firmly just beyond the 25 mm (1 in.) mark and pull at a 90-degree angle.
      e. If dissimilar substrates are being sealed, check the adhesion of sealant to each substrate separately. This is accomplished by extending the vertical cut along one side of the joint, checking adhesion to the opposite side, and then repeating for the other surface.
      f. Pass/ fail criteria for each sealant are shown in Table below. If the sealant does not pass according to the guidelines provided, consult the manufacturer’s representative.
      g. Inspect the joint for complete fill. The joint should not have voids, and joint dimensions should match those shown in the weathersealing details. The manufacturer’s representative can assist in determining when corrective action is required.
      h. Record the test results in a field adhesion test log. This log will need to be retained as a part of the manufacturer’s warranty procedure. Some building officials may also require it.
   2. NOTE: When a sealant is used to weatherseal between two dissimilar substrates, it is recommended that the sealant adhesion to each side of the joint be individually tested. (See step e).

B. Field Adhesion Hand Pull Test Criteria:
   1. Contractor shall perform field adhesion hand pull test in conformance with the sealant manufacturer’s criteria requirements. Contractor shall have Architect present for approval of field adhesion hand pull test.

C. Sealant Repair in Adhesion Test Area:
   1. Repair the sealant pulled from the test area by applying new sealant to the test area. Assuming good adhesion was obtained, use the same application procedure to repair the areas as was used to originally seal it. Care should be taken to ensure that the original sealant surfaces are clean and that the new sealant is in contact with the original sealant.

End of Section
08 12 13 Hollow Metal Frames

Part 1 – General

1.1 Scope

A. The scope of steel frames shall be as shown on drawings and as specified herein. It shall include all materials, equipment, and labor to provide fully installed steel frames. The work shall include, but is not limited to, the following:
   1. Provide and install hollow metal steel frames for interior applications.
   2. Prepare for hardware as scheduled and specified.
   3. Miscellaneous fasteners and anchors.

1.2 Related Work

A. Section 08 14 16 Flush Wood Doors
B. Section 08 71 00 Door Hardware
C. Section 08 80 00 Glazing
D. Section 09 90 00 Painting and Coating

1.3 References

A. SDI Standards:
   1. SDI 106 Recommended Standard Door Type Nomenclature
   2. SDI 108 Recommended Selection and Usage Guide for Standard Steel Doors
   3. SDI 111 Recommended Details and Guidelines for Standard Steel Doors, Frames, and Accessories
   4. SDI 112 Zinc-Coated (Galvanized/ Galvannealed) Standard Steel Doors and Frames
   5. SDI 117 Manufacturing Tolerances for Standard Steel Doors and Frames
   6. SDI 118 Basic Fire Door Requirements
   7. SDI 124 Maintenance of Standard Steel Doors and Frames
B. ANSI Standards:
   1. ANSI/ UL 10B Fire Tests of Door Assemblies
   2. ANSI/ UL 10C Positive Pressure Fire Tests of Door Assemblies
   3. ANSI/ UL 1784 Air Leakage Test of Door Assemblies
   4. ANSI/ NFPA 80 Fire Doors and Fire Windows
   5. ANSI/ NFPA 252 Fire Tests of Door Assemblies
   6. ANSI/ SDI A250.3 Test Procedure and Acceptance Criteria for Factory Applied Finish Painted Steel Surfaces for Steel Doors and Frames
   7. ANSI/ SDI A250.4 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcing
   8. ANSI/ SDI A250.6 Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames
   9. ANSI/ SDI A250.7 Nomenclature for Standard Steel Doors and Steel Frames
   10. ANSI/ SDI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames
   11. ANSI/ SDI A250.11 Recommended Erection Instructions for Steel Frames
   12. A115 Hardware Preparation in Steel Doors and Steel Frames
   13. A115.IG Installation Guide for Doors and Hardware
C. ASTM Standards:
   1. ASTM A1008 Standard Specifications for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
   2. ASTM A568 Standard Specification for steel Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
3. ASTM A1011 Standard Specification for Steel Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability
4. ASTM A591 Standard Specification for Steel Sheet, Electrolytic Zinc-coated, for Light Coating Weight (Mass) Applications
5. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Glavannealed) by the Hot-Dip Process
6. ASTM A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

1.4 Submittals

A. Product Data: Submit manufacturer’s specifications and catalog sheets for each type of product specified, including details of construction, materials, dimensions, hardware preparation, core, label compliance, sound ratings, profiles, and finishes.

B. Shop Drawings: Include elevations, frame profiles, metal thicknesses, preparations for hardware, and other details. Show anchorage and accessory items.

C. Schedule: Prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings.

1.5 Quality Assurance

A. Steel Door and Frame Standard: Comply with ANSI A250.8 unless more stringent requirements are indicated.

B. Single Source Manufacturer: Provide doors and frames from a single manufacturer who is a member of the Steel Door Institute.

1.6 Delivery, Storage, and Handling

A. Deliver doors and frames palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Inspect metal work upon delivery for damage. Minor damages may be repaired in field provided the finished items are equal in all respects to new work and are acceptable to Architect. Otherwise, remove and replace damaged items as directed.

D. Store doors and frames at the job site under cover. Place the units in a manner that will prevent rust and damage. The doors and frames shall be stored vertically. Stack in such a manner to allow for air circulation.

E. Handle doors and frames in compliance with manufacturer’s recommendations.

1.7 Project Conditions

A. Installer must examine the substrates and conditions under which steel doors and frames are to be installed. Notify General Contractor and Architect in writing of any unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

1.8 Warranty

A. Provide manufacturer’s standard warranty for doors and frames.
Part 2 - Products

2.1 Manufacturers

A. Acceptable Manufacturers: The manufacturers meeting compliance with the requirements of this specification and approval by Architect may include the following:
   1. Amweld Building Products, LLC.
   2. Ceco Door Products
   3. Republic Steel Corporation
   4. Steelcraft
   5. Prior Approved Equal

2.2 Materials

A. Cold-Rolled Sheets: Steel shall conform to ASTM A1008 and ASTM A568.
B. Hot-Rolled Sheets: Steel shall comply with ASTM A1011 and ASTM A568.
C. Galvanized Steel Sheets: Shall be manufactured from hot-dipped galvanized steel, G60 zinc coating conforming to ASTM A924 and ASTM A653. Galvanized doors shall have galvanized hardware reinforcement.
D. Frame Anchors: ASTM A591/ A591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized. Galvanized shall be used with galvanized frames.
E. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/ A153M.
F. Grout: ASTM C476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C143/ C143M.
G. Core: Provide manufacturer’s standard core for thermally improved doors with maximum U-Value of 0.24 btu/hr/sq.ft./degree F (ASTM C236) for all exterior doors.
H. Glazing: See Section 08 80 00 Glazing
I. Bituminous Coating: Cold-applied asphalt mastic, SSPC-Paint 12, compounded for 15 mil (0.4 mm) dry film thickness per coat. Provide inert-type non-corrosive compound free of asbestos fibers and sulfur components.

2.1 Hollow Metal Frames

A. Steel Frames, General: Complying with ANSI/ SDI A250.8 for level and model and ANSI A250.4 for physical endurance level indicated. Frames shall be concealed fastened.
   1. Interior Frames (See Drawings for Sizes, Shapes, and Details):
      a. Level 2 (Heavy-Duty Doors 1 3/4 inch thickness) and Physical Performance Level B
      b. Hot Dipped zinc coated steel (galvanized) complying with ASTM A924 and ASTM A653, primed finish for field applied finish paint
      c. Steel Thickness Door Frames – minimum 0.053 inch thick (16 gauge)
      d. Frame Construction – Face Welded Frames (joint between the head and jamb faces shall be completely arc welded along their length, face joints shall be ground and finished smooth with no visible seam
      e. Drywall Returns: Frames installed in drywall partitions shall be furnished with drywall returns. See drawings for required return dimensions.
      f. Door Silencers: Except on weather stripped frames, drill stops to receive 3 silencers on strike jambs of single door frames and 2 silencers on heads of double door frames.
      g. Ceiling Struts: Minimum 1/4-thick by 1-inch wide steel.
      h. Provide minimum hardware reinforcing for the following conditions:
         1) Mortise Hinge 1 3/4 Door Thickness: 0.123 inches (10 gauge)
         2) Mortise Lock or Deadbolt: 0.067 inches (14 gauge)
         3) Bored Lock or Deadbolt: 0.067 inches (14 gauge)
         4) Flush Bolt Front: 0.067 inches (14 gauge)
5) Surface bolt: 0.067 inches (14 gauge)
6) Surface Applied Closer: 0.067 inches (14 gauge)
7) Hold Open Arm: 0.067 inches (14 gauge)
8) Pull Plates and Bar: 0.053 inches (16 gauge)
9) Surface Exit Device: 0.067 inches (14 gauge)
10) Continuous Hinge: Not required
11) Kick/ Push Plate: Not Required

i. Label Requirements: Provide tested fire rated and/or smoke rated assemblies where indicated on drawings. Label door assemblies with system rating.

j. Provide frames with a minimum of three (3) anchors per jamb suitable for the adjoining construction. Provide anchors of not less than 0.042 inches in thickness or 0.167 inches diameter wire. Frames over 7’-6” shall be provided with an additional anchor per jamb.

1) Metal Stud Anchor: 16 gauge clips welded in side and head jambs. Clips shall be manufacturer’s standard design for stud/ metal framing type involved.
2) Base Anchors: 18 gauge removable spreaders and adjustable 16 gauge floor clips.

B. Hardware: Reinforce, drill, and tap for hardware furnished under Section 08 71 00 Door Hardware, except drilling and tapping for surface door closers, door closer brackets and adjusters shall be done in field. Obtain templates from hardware suppliers.

C. Finish: Provide prime coat finish on frames. Doors and frames shall be thoroughly cleaned, and chemically treated to insure maximum paint adhesion. All surfaces of the door and frame exposed to view shall receive a factory applied coat of rust inhibiting primer. See Section 09 90 00 Painting and Coating for field applied finish paint.

2.2 Design Clearances

A. The clearance between the door and frame head and jambs shall be 1/8 inch in the case of both single swing and pairs of doors.

B. The clearance between the meeting edges of pairs of doors shall be 1/8 inch to 1/4 inch, for fire rated doors 1/8 inch +/- 1/16 inch.

C. The clearance at the bottom shall be 3/4 inch, unless otherwise indicated on drawings.

D. The clearance between the face of the door and the door stop shall be 1/16 inch to 1/8 inch.

E. All clearance shall be, unless otherwise specified, subject to tolerance of +/- 1/32 inch.

2.3 Fabrication

A. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

Part 3 - Execution

3.1 Installation

A. Hollow Metal Frames: 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 NFPA80.
   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 or make any contact with masonry.

h. All frames set in masonry will have a 1/8 inch gap between frame flanges and masonry to allow for a full bed of caulk.

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. 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.

D. Glazing: Comply with installation requirements in Section 08 80 00 Glazing and with hollow metal manufacturer's written instructions.

E. Secure stops with countersunk flat or oval head machine screws spaced uniformly not more than 9 inches (230 mm) o.c. and not more than 2 inches (50 mm) o.c. from each corner.

3.2 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. 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.

C. Galvanized Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

End of Section
08 14 16 Flush Wood Doors

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-core doors with wood-veneer faces.
      2. Factory fitting flush wood doors to frames and factory machining for hardware.

1.3 Preinstallation Meetings
   A. Preinstallation Conference: Conduct conference at Project site.

1.4 Action Submittals
   A. Product Data: For each type of door. Include details of core and edge construction and trim for openings.
   B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
      1. Dimensions and locations of blocking.
      2. Dimensions and locations of mortises and holes for hardware.
      3. Dimensions and locations of cutouts.
      4. Undercuts.
      5. Requirements for veneer matching.
      6. Doors to be factory finished and finish requirements.
      7. Fire-protection ratings for fire-rated doors.
   C. Samples for Initial Selection: For factory-finished doors.
   D. Samples for Verification:
      1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches (200 by 250 mm), for each material and finish. For each wood species and transparent finish, provide set of three Samples showing typical range of color and grain to be expected in finished Work.
      2. Corner sections of doors, approximately 8 by 10 inches (200 by 250 mm), with door faces and edges representing actual materials to be used.
         a. Provide Samples for each species of veneer and solid lumber required.
         b. Provide Samples for each color, texture, and pattern of plastic laminate required.
         c. Finish veneer-faced door Samples with same materials proposed for factory-finished doors.

1.5 Informational Submittals
   A. Sample Warranty: For special warranty.
   B. Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

1.6 Quality Assurance
   A. Manufacturer Qualifications: A qualified manufacturer that is a certified participant in AWI's Quality Certification Program.
B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body.

1.7 Delivery, Storage, and Handling

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

1.8 Field Conditions

A. Environmental Limitations: 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 ambient temperature and humidity conditions at occupancy levels during remainder of construction period.

1.9 Warranty

A. Special Warranty: Manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Warping (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch (1067-by-2134-mm) section.
      b. Telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 76.2-mm) span.
   2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.

Part 2 - Products

2.1 Manufacturers

A. Manufacturers:
   1. Mohawk Floor Doors
   2. Algoma Hardwoods
   3. Oshkosh Door Company
   4. Poncraft Door Company
   5. Haley Brothers, Inc.
B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 Flush Wood Doors, General

A. Quality Standard: In addition to requirements specified, comply with AWI’s, AWMAC’s, and WI's "Architectural Woodwork Standards
   1. Provide AWI Quality Certification Labels indicating that doors comply with requirements of grades specified.
   2. Contract Documents contain selections chosen from options in quality standard and additional requirements beyond those of quality standard. Comply with those selections and requirements in addition to quality standard.
B. Regional Materials: Flush wood doors shall be manufactured within 500 miles (800 km) of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site.
C. Regional Materials: Flush wood doors shall be manufactured within 500 miles (800 km) of Project site.
D. Certified Wood: Flush wood doors shall be certified as "FSC Pure"[or "FSC Mixed Credit"] according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and to FSC STD-40-004, "FSC Standard for Chain of Custody Certification."

E. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain urea formaldehyde.

F. WDMA I.S.1-A Performance Grade: Heavy Duty WDMA I.S.1-A Performance Grade:
   1. Heavy Duty unless otherwise indicated.

G. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252:
   1. Temperature-Rise Limit: provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire-test exposure.
   2. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
   3. Edge Construction: Provide edge construction with intumescent seals concealed by outer stile. Comply with specified requirements for exposed edges.

H. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.

I. Particleboard-Core Doors:
   1. Particleboard: ANSI A208.1, Grade LD-2, made with binder containing no urea formaldehyde.
   2. Blocking: Provide wood blocking in particleboard-core doors as needed to eliminate through-bolting hardware.
   3. Provide doors with glued-wood-stave or structural-composite-lumber cores instead of particleboard cores for doors indicated to receive exit devices.

2.3 Veneer-Faced Doors for Transparent Finish

A. Interior Solid-Core Doors:
   1. Grade: Custom (Grade B faces)
   2. Species: Where existing doors are present, match species of existing doors. Otherwise, to be selected by Architect from Manufacturer’s available options.
   3. Cut: Where existing doors are present, match cut of existing doors. Otherwise, to be selected by Architect from Manufacturer’s available options.
   4. Match between Veneer Leaves: Where existing doors are present, match leaves of existing doors. Otherwise, to be selected by Architect from Manufacturer’s available options.
   5. Assembly of Veneer Leaves on Door Faces: Where existing doors are present, match leaf assembly of existing doors. Otherwise, to be selected by Architect from Manufacturer’s available options.
   6. Core: Either glued wood stave or structural composite lumber.
   7. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
   8. WDMA I.S.1-A Performance Grade: Heavy Duty

2.4 Fabrication

A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
   1. Comply with NFPA 80 requirements for fire-rated doors.

B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, and hardware templates.
1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
2. Metal Astragals: Factory machine astragals and formed-steel edges for hardware for pairs of fire-rated doors.

2.5 Shop Priming
A. Doors for Transparent Finish: Shop prime faces and all four edges with stain (if required), other required pretreatments, and first coat of finish as specified in Section 09 90 00 "Painting and Coating." Seal edges of cutouts and mortises with first coat of finish.

2.6 Factory Finishing
A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
   1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on bottom edges, edges of cutouts, and mortises.
B. Factory finish doors.
C. Use only paints and coatings that 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."
D. Transparent Finish:
   1. Grade: Premium.
   2. Finish: AWI's, AWMAC's, and WI's "Architectural Woodwork Standards" System 9, UV curable, acrylated epoxy, polyester, or urethane
   3. Staining: Where existing doors are present, match color and finish of existing doors. Otherwise, to be selected by Architect from Manufacturer’s available options.

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 08 71 00 "Door Hardware."
B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
   1. Install fire-rated doors according to NFPA 80.
   2. Install smoke- and draft-control doors according to NFPA 105.
C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
   1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold unless otherwise indicated.
Flush Wood Doors

Jefferson Parish Human Services Authority
Hurricane Repairs and Renovation Project
1500 River Oaks Road West, Elmwood, LA 70123

a. Comply with NFPA 80 for fire-rated doors.
b. Bevel non-fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
   2. Bevel fire-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock edge; trim stiles and rails only to extent permitted by labeling agency.
D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
E. Factory-Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 Adjusting

A. Operation: Rehang or replace doors that do not swing or operate freely.
B. Finished Doors: Replace doors that are damaged or that 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
08 56 59 Aluminum Interior Sliding Service Window

Part 1 – General

1.1 Scope

A. The scope of aluminum interior sliding service windows shall be as shown on drawings and as indicated herein. It shall include all materials, equipment, and labor as required for a complete installation. Service window work shall include, but is not limited to, the following:
   1. Aluminum, medium-duty interior sliding service windows.
   2. Miscellaneous components and accessories as required for installation.

1.2 Related Sections

A. Section 07 90 00 Joint Protections (Sealants)
B. Section 08 12 13 Hollow Metal Frames
C. Section 08 80 00 Glazing

1.3 Submittals

A. Product Data: Submit Manufacturer’s technical product data substantiating that products comply.
B. Shop drawings: Submit for fabrication and installation of windows. Include details, elevations and installation requirement of finish hardware and cleaning.
C. Samples: Provide metal chip sample of finish options for Architect selection.
D. Certification: Provide printed data in sufficient detail to indicate compliance with the contract documents.

1.4 Delivery, Storage, And Handling

A. Deliver windows crated to provide protection during transit and job storage.
B. Inspect windows upon delivery for damage. Unless minor defects can be made to meet the Architect’s specifications and satisfaction, damaged parts should be removed and replaced.
C. Store windows at building site under cover in dry location.

1.5 Project Conditions

A. Field measurements: Check opening by accurate field measurement before fabrication. Show recorded measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of work.

1.6 Warranty

A. All material and workmanship shall be warranted against defects for a period of one (1) year from date of Substantial Completion.

Part 2 - Products

2.1 Manufacturer

A. Basis of Design: Design is based on aluminum, interior sliding service window manufactured by C.R. Laurence Co., Inc. (800) 421-6144.
B. Alternate Manufactures: Other acceptable alternate manufacturers pending specific product approval by Architect indicating compliance with all requirements of this specification, may include the following:
   1. Prior Approved Equal.
2.2 Materials

A. Models: Daisy Pass-Thru (XX), two sliding glass panels. (Designations are X = sliding panel, O = fixed panel, as viewed from clerk’s side.)
B. Size: As indicated on drawings.
C. Quantities: As indicated on drawings.
D. Frames: Aluminum frame modules shall be constructed of 6063-T5 extruded aluminum. Window rolls on top-hung ball bearing rollers. Catch locks included with all interior windows. Overall frame sizes are to be in accordance with the contract drawings. All units shipped as knocked down and ready to assemble.
E. Finish: All aluminum to be clear anodized, or duranodic bronze. Finish shall be selected by Architect from these choices.
F. Overhead Track: D4 Overhead track, back loaded.
G. Jambs: To be provided. Match frame finish as selected by Architect.
H. Glazing: The glazing vinyl supplied is for 1/4 inch in thickness. Glass not included, to be supplied by others but must be tempered. See Section 08 80 00 Glazing.
J. Panels: Equally divided two panels.
K. Options: Provide Low Profile Deck Catch, spring loaded retractable plunger.

Part 3 – Execution

3.1 Installation

A. Install window in accordance with manufacturer’s printed instructions and recommendations. Repair damaged units as directed (if approved by the manufacturer and the architect) or replace with new units.

3.2 Cleaning

A. Clean frame and glazing surfaces after installation, complying with requirements contained in the manufacturer’s instructions. Remove excess glazing sealant compounds, dirt, or other substances.

3.3 Protection

A. Institute protective measures required throughout the remainder of the construction period to ensure that all the windows do not incur any damage or deterioration, other than normal weathering, at the time of acceptance.

End of Section
08 71 00 Door Hardware

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. Mechanical door hardware for the following:
      a. Swinging doors.
      b. Sliding doors.
      c. Folding doors.
   2. Cylinders for door hardware specified in other Sections.
   3. Electrified door hardware.
B. Related Sections:
   1. Section 0812 13 "Hollow Metal Frames" door silencers provided as part of hollow-metal frames.
   2. Section 08 14 16 "Flush Wood Doors" for door hardware.

1.3 Action Submittals
A. Product Data: For each type of product indicated. Include construction and installation details, material descriptions, dimensions of individual components and profiles, and finishes.
B. Shop Drawings: Details of electrified door hardware, indicating the following:
   1. Wiring Diagrams: For power, signal, and control wiring and including the following:
      a. Details of interface of electrified door hardware and building safety and security systems.
      b. Schematic diagram of systems that interface with electrified door hardware.
      c. Point-to-point wiring.
      d. Risers.
      e. Elevations doors controlled by electrified door hardware.
   2. Operation Narrative: Describe the operation of doors controlled by electrified door hardware.
C. Samples for Initial Selection: For plastic protective trim units in each finish, color, and texture required for each type of trim unit indicated.
D. Samples for Verification: For exposed door hardware of each type required, in each finish specified, prepared on Samples of size indicated below. Tag Samples with full description for coordination with the door hardware schedule. Submit Samples before, or concurrent with, submission of door hardware schedule.
   1. Sample Size: Full-size units or minimum 2-by-4-inch (51-by-102-mm) Samples for sheet and 4-inch (102-mm) long Samples for other products.
      a. Full-size Samples will be returned to Contractor. Units that are acceptable and remain undamaged through submittal, review, and field comparison process may, after final check of operation, be incorporated into the Work, within limitations of keying requirements.
E. Other Action Submittals:
   1. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
a. Submittal Sequence: Submit door hardware schedule concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate the fabrication of other work that is critical in Project construction schedule.

b. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule." Double space entries, and number and date each page.

c. Format: Use same scheduling sequence and format and use same door numbers as in the Contract Documents.

d. Content: Include the following information:
   1) Identification number, location, hand, fire rating, size, and material of each door and frame.
   2) Locations of each door hardware set, cross-referenced to Drawings on floor plans and to door and frame schedule.
   3) Complete designations, including name and manufacturer, type, style, function, size, quantity, function, and finish of each door hardware product.
   4) Description of electrified door hardware sequences of operation and interfaces with other building control systems.
   5) Fastenings and other pertinent information.
   6) Explanation of abbreviations, symbols, and codes contained in schedule.
   7) Mounting locations for door hardware.
   8) List of related door devices specified in other Sections for each door and frame.

2. Keying Schedule: Prepared by or under the supervision of Installer, detailing Owner's final keying instructions for locks. Include schematic keying diagram and index each key set to unique door designations that are coordinated with the Contract Documents.

1.4 Informational Submittals

   A. Qualification Data: For Installer.
   B. Product Certificates: For electrified door hardware, from the manufacturer.
      1. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
   C. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes.
   D. Warranty: Special warranty specified in this Section.

1.5 Closeout Submittals

   A. Maintenance Data: For each type of door hardware to include in maintenance manuals. Include final hardware and keying schedule.

1.6 Quality Assurance

   A. Installer Qualifications: Supplier of products and an employer of workers trained and approved by product manufacturers and an Architectural Hardware Consultant who is available during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.
      1. Warehousing Facilities: In Project's vicinity.
      2. Scheduling Responsibility: Preparation of door hardware and keying schedules.
      3. Engineering Responsibility: Preparation of data for electrified door hardware, including Shop Drawings, based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project.
B. Source Limitations: Obtain each type of door hardware from a single manufacturer.
   1. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated. Manufacturers that perform electrical modifications and that are listed by a testing and inspecting agency acceptable to authorities having jurisdiction are acceptable.

C. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated, provide door hardware rated for use in assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to NFPA 252 or UL 10C, unless otherwise indicated.

D. Smoke- and Draft-Control Door Assemblies: Where smoke- and draft-control door assemblies are required, provide door hardware that meet requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105.
   1. Air Leakage Rate: Maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at the tested pressure differential of 0.3-inch wg (75 Pa) of water.

E. Electrified Door Hardware: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

F. Means of Egress Doors: Latches do not require more than 15 lbf (67 N) to release the latch. Locks do not require use of a key, tool, or special knowledge for operation.

G. Accessibility Requirements: Comply with applicable provisions in the DOJ's 2010 ADA Standards for Accessible Design for door hardware on doors in an accessible route.
   1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbf (22.2 N).
   2. Comply with the following maximum opening-force requirements:
      a. Interior, Non-Fire-Rated Hinged Doors: 5 lbf (22.2 N) applied perpendicular to door.
      b. Fire Doors: Minimum opening force allowable by authorities having jurisdiction.
   3. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch (13 mm) high.
   4. Closers: Adjust door and gate closer sweep periods so that, from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.
   5. Spring Hinges: Adjust door and gate spring hinges so that, from an open position of 70 degrees, the time required to move the door to the closed position is 1.5 seconds minimum.

H. Keying Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." In addition to Owner, Contractor, and Architect, conference participants shall also include Installer's Architectural Hardware Consultant and Owner's security consultant. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
   1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
   2. Preliminary key system schematic diagram.
   3. Requirements for key control system.
   4. Requirements for access control.
   5. Address for delivery of keys.

I. Preinstallation Conference: Conduct conference at Project site
   1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   2. Inspect and discuss preparatory work performed by other trades.
   3. Inspect and discuss electrical roughing-in for electrified door hardware.
   4. Review sequence of operation for each type of electrified door hardware.
   5. Review required testing, inspecting, and certifying procedures.
1.7 Delivery, Storage, and Handling

A. Inventory door hardware on receipt and provide secure lock-up for door hardware delivered to Project site.
B. Tag each item or package separately with identification coordinated with the final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package.
C. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.
D. Deliver keys and permanent cores to Owner by registered mail or overnight package service.

1.8 Coordination

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.
B. Installation Templates: Distribute for doors, frames, and other work specified to be factory prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.
D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.
E. 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.

1.9 Warranty

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within specified warranty period.
   1. Failures include, but are not limited to, the following:
      a. Structural failures including excessive deflection, cracking, or breakage.
      b. Faulty operation of doors and door hardware.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
   2. Warranty Period: For new hardware, three years from date of Substantial Completion, unless otherwise indicated.
      a. Electromagnetic Locks: Five years from date of Substantial Completion.
      b. Exit Devices: Two years from date of Substantial Completion.
      c. Manual Closers: 10 years from date of Substantial Completion.

1.10 Maintenance Service

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.
B. Maintenance Service: Beginning at Substantial Completion, provide six [6] months' full maintenance by skilled employees of door hardware Installer. Include quarterly preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door and door hardware operation. Provide parts and supplies that are the same as those used in the manufacture and installation of original products.
Part 2 - Products

2.1 Scheduled Door Hardware

A. Provide door hardware for each door as scheduled on Drawings to comply with requirements in this Section.
   1. Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and products equivalent in function and comparable in quality to named products.
   2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.

B. Designations: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of door hardware are indicated in Part 3 "Door Hardware Schedule" Article. Products are identified by using door hardware designations, as follows:
   1. Named Manufacturers' Products: Manufacturer and product designation are listed for each door hardware type required for the purpose of establishing minimum requirements. Manufacturers' names are abbreviated in Part 3 "Door Hardware Schedule" Article.
   2. References to BHMA Designations: Provide products complying with these designations and requirements for description, quality, and function.

2.2 Hinges

A. Hinges: BHMA A156.1. Provide template-produced hinges for hinges installed on hollow-metal doors and hollow-metal frames.
   1. Manufacturers:
      a. Baldwin Hardware
      b. Hager Companies
      c. Lawrence Hardware
      d. Stanley Commercial Hardware

2.3 Mechanical Locks and Latches

A. Lock Functions: As indicated in door hardware schedule.
B. Lock Backset: 2-3/4 inches (70 mm), unless otherwise indicated.
C. Lock Trim:
   1. Description: As indicated on Drawings. Match new hardware to existing hardware.
   2. Levers: Cast.
      a. Match existing hardware style
   4. Dummy Trim: Match lever lock trim and escutcheons.
   5. Operating Device: Lever with escutcheons (roses).
D. Strikes: Provide manufacturer's standard strike for each lock bolt or latchbolt complying with requirements indicated for applicable lock or latch and with strike box and curved lip extended to protect frame; finished to match lock or latch.
   1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
   2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
   3. Aluminum-Frame Strike Box: Manufacturer's special strike box fabricated for aluminum framing.
   4. Rabbet Front and Strike: Provide on locksets for rabbeted meeting stiles.
E. Mortise Locks: BHMA A156.13; Operational Grade [1] [2]; stamped steel case with steel or brass parts; Series 1000.
   1. Manufacturers:
      a. C.R. Lawrence Co.
      b. Hager Companies
c. Lawrence Hardware  
d. Yale Security Inc.

2.4 Electric Strikes

A. Electric Strikes: BHMA A156.31; Grade [1] [2]; with faceplate to suit lock and frame.
   1. Manufacturers:
      a. C.R. Lawrence Co.  
      b. Hager Companies  
      c. Lawrence Hardware  
      d. Yale Security Inc.

2.5 Exit Devices and Auxiliary Items

A. Exit Devices and Auxiliary Items: BHMA A156.3.
   1. Manufacturers:
      a. C.R. Lawrence Co.  
      b. Hager Companies  
      c. Lawrence Hardware  
      d. Yale Security Inc.

2.6 Lock Cylinders

A. Lock Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
   1. Manufacturer: Same manufacturer as for locking devices.
   2. Manufacturers:
      a. ASSA Abloy  
      b. Hager companies  
      c. Stanley Commercial Hardware  
      d. Yale Security Inc.
B. Standard Lock Cylinders: BHMA A156.5; Grade [1] [1A] [2]; permanent cores that are interchangeable; face finished to match lockset.
D. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.

2.7 Keying

   1. Existing System:
      a. Sub-Master Keys for individually locked spaces.
      b. Master Keys per keying meeting with Owner and Architect.
      c. Grand Master Key of all spaces per each building level: first, second, and third floors.
      d. Great Grand Master Key of all spaces within building.
      e. Coordinate with Owner's existing keying system.
      f. Re-key Owner's existing master key system into new keying system.
   2. Keyed Alike: Key all cylinders to same change key.
B. Keys: Brass.
   1. Stamping: Permanently inscribe each key with a visual key control number and include the following notation:
      a. Notation: "DO NOT DUPLICATE."
   2. Quantity: In addition to one extra key blank for each lock, provide the following:
2.8 Operating Trim

A. Operating Trim: BHMA A156.6; unless otherwise indicated.
   1. Where an existing system is present, match existing hardware material and finish. Otherwise to be selected by Architect from manufacturer’s available options.

2.9 Surface Closers

A. Surface Closers: BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer’s written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
   1. Manufacturers:
      a. Corbin Russwin, Inc.
      b. Hager Companies
      c. Sargent Manufacturing Company
      d. Yale Security, Inc.

2.10 Mechanical Stops and Holders

A. Wall- and Floor-Mounted Stops: BHMA A156.16; match existing finish & base metal.
   1. Manufacturers:
      a. Baldwin Hardware Corporation
      b. Hager Companies
      c. Trimco
      d. Rockwood Manufacturing

2.11 Door Gasketing

A. Door Gasketing: BHMA A156.22; air leakage not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283; with resilient or flexible seal strips that are easily replaceable and readily available from stocks maintained by manufacturer.
   1. Hager Companies
   2. Rockwood Manufacturing
   3. Prior approved equal

2.12 Thresholds

A. Thresholds: BHMA A156.21; fabricated to full width of opening indicated.
   1. Hager Companies
   2. Rockwood Manufacturing
   3. Corbin Russwin

2.13 Fabrication

A. Manufacturer’s Nameplate: Do not provide products that have manufacturer’s name or trade name displayed in a visible location except in conjunction with required fire-rated labels and as otherwise approved by Architect.
   1. Manufacturer’s identification is permitted on rim of lock cylinders only.
B. Base Metals: Produce door hardware units of base metal indicated, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18.

C. Fasteners: Provide door hardware manufactured to comply with published templates prepared for machine, wood, and sheet metal screws. Provide screws that comply with commercially recognized industry standards for application intended, except aluminum fasteners are not permitted. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
   1. Concealed Fasteners: For door hardware units that are exposed when door is closed, except for units already specified with concealed fasteners. Do not use through bolts for installation where bolt head or nut on opposite face is exposed unless it is the only means of securely attaching the door hardware. Where through bolts are used on hollow door and frame construction, provide sleeves for each through bolt.
   2. Fire-Rated Applications:
      a. Wood or Machine Screws: For the following:
         1) Hinges mortised to doors or frames; use threaded-to-the-head wood screws for wood doors and frames.
         2) Strike plates to frames.
         3) Closers to doors and frames.
   3. Fasteners for Wood Doors: Comply with requirements in DHIWDHS.2, "Recommended Fasteners for Wood Doors."
   4. Gasketing Fasteners: Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

2.14 Finishes

A. Provide finishes complying with BHMA A156.18 as indicated in door hardware schedule.
B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
C. 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.

Part 3 - Execution

3.1 Examination

A. Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance.
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: For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
B. Wood Doors: Comply with DHIWDHS.5 "Recommended Hardware Reinforcement Locations for Mineral Core Wood Flush Doors."
3.3 Installation

A. Mounting Heights: Mount door hardware units at heights to comply with the following unless otherwise indicated or required to comply with governing regulations.
   2. Custom Steel Doors and Frames: HMMA 831.

B. 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. 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.

C. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than the number recommended by manufacturer for application indicated or one hinge for every 30 inches (750 mm) of door height, whichever is more stringent, unless other equivalent means of support for door, such as spring hinges or pivots, are provided.

D. Intermediate Offset Pivots: Where offset pivots are indicated, provide intermediate offset pivots in quantities indicated in door hardware schedule but not fewer than one intermediate offset pivot per door and one additional intermediate offset pivot for every 30 inches (750 mm) of door height greater than 90 inches (2286 mm).

E. Lock Cylinders: Install construction cores to secure building and areas during construction period.
   1. Replace construction cores with permanent cores as directed by Owner.
   2. Furnish permanent cores to Owner for installation.

F. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.

G. Boxed Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings.
   1. Configuration: Provide one power supply for each door opening with electrified door hardware.

H. Thresholds: Set thresholds for exterior doors and other doors indicated in full bed of sealant complying with requirements specified in Section 07 90 00 "Joint Protections (Sealants)."

I. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they will impede traffic.

J. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

K. Door Bottoms: Apply to bottom of door, forming seal with threshold when door is closed.

3.4 Field Quality Control

A. Independent Architectural Hardware Consultant: Owner will engage a qualified independent Architectural Hardware Consultant to perform inspections and to prepare inspection reports.
   1. Independent Architectural Hardware Consultant will inspect door hardware and state in each report whether installed work complies with or deviates from requirements, including whether door hardware is properly installed and adjusted.
3.5 Adjusting

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
   1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
   2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
   3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three [3] months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, 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 that door hardware is without damage or deterioration at time of Substantial Completion.

3.7 Demonstration

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain door hardware and door hardware finishes. Refer to Section 01 77 80 "Project Closeout and Closeout Submittals."

Door Hardware Schedule follows.
3.8 Door Hardware Schedule

**Hardware Set #1 for Offices, Reception, Storage Rooms:** Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Keyed Entrance / Office Lever Lockset, one (1) Overhead Doorstop per leaf, and Mutes:

- Door 1F Office 101A from Corridor C101
- Door 8F Office 101B from Corridor C101
- Door 1F Office 101D from Corridor C101
- Door 1 Reception 104 from Lobby 102
- Door 1F Office 105A from Corridor C105
- Door 8F Facility Management Office 105B from Corridor C105
- Door 1 Psychologist’s Office 111A from Corridor C111
- Door 1 Office 111B from Corridor C111
- Door 1 DDCS Assistant Director’s Office 111C from Corridor C111
- Door 1 DDCS Director’s Office 111D from Corridor C111
- Door 1 Office 111E from Corridor C111
- Door 1 Office 112B from Corridor C112
- Door 1 Office 112C from Corridor C112
- Door 1 Office 112E from Corridor C112
- Door 1 Office 112F from Corridor C112
- Door 1 Office 112G from Corridor C112
- Door 8 Office 112H from Corridor C112
- Door 8 Office 112I from Corridor C112
- Door 8 Office 112J from Corridor C112
- Door 8 Office 112K from Corridor C112
- Door 1F Office 113A from Corridor C113
- Door 1F Office 113C from Corridor C113
- Door 1F Office 113D from Corridor C113
- Door 1F Office 113E from Corridor C113
- Door 1F Office 113F from Corridor C113
- Door 1F Office 113G from Corridor C113
- Door 1F Office 113H from Corridor C113
- Door 1F Office 113I from Corridor C113
- Door 8 Office 207B from Open Office 207
- Door 8 Office 207C from Open Office 207
- Door 8 Office 207D from Open Office 207
- Door 8 Office 207E from Open Office 207
- Door 8F Office 203 from Corridor C200
- Door 8F Office 205 from Corridor C200
- Door 1F Office 213 from Corridor C200
- Door 1F Office 215 from Corridor C200
- Door 1F Office 217 from Corridor C200
- Door 1F Office 219 from Corridor C200
- Door 1F Office 220 from Corridor C200
- Door 1F Office 221 from Corridor C200
- Door 1F Office 222 from Corridor C200
- Door 1F Office 223 from Corridor C200
- Door 1F Office 225 from Corridor C200
- Door 1F Office 227 from Corridor C200
- Door 1F Office 228 from Corridor C200
- Door 1F Office 230 from Corridor C200
Door Hardware  08 71 00-12

### Hardware Set #1 continued

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8F</td>
<td>Office 232 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Office 235 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Office 237 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Office 239 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Office 241 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Office 243 from Corridor C200</td>
</tr>
<tr>
<td>1</td>
<td>Flex Office 304A from Vestibule 304</td>
</tr>
<tr>
<td>1</td>
<td>Executive Director’s Office 304B from Vestibule 304</td>
</tr>
<tr>
<td>1</td>
<td>Administrative Assistant’s Office 304C from Vestibule 304</td>
</tr>
<tr>
<td>2F</td>
<td>Storage 101G from Corridor C101</td>
</tr>
<tr>
<td>4</td>
<td>Storage 105E1 from Break Room 105E</td>
</tr>
<tr>
<td>14F</td>
<td>Janitor 100A from Corridor C100</td>
</tr>
<tr>
<td>1F</td>
<td>Storage 108B from Corridor C108</td>
</tr>
<tr>
<td>1F</td>
<td>Storage 113J from Corridor C113</td>
</tr>
<tr>
<td>10F</td>
<td>Storage 208 from Corridor C200 (pair of swing doors)</td>
</tr>
<tr>
<td>8F</td>
<td>Facility Management Storage 307 from Corridor C300</td>
</tr>
<tr>
<td>8</td>
<td>Facility Management Storage 307B from Facility Management Storage 307</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Facility Management Storage 307</td>
</tr>
<tr>
<td>13</td>
<td>Side Attic from Storage 301</td>
</tr>
<tr>
<td>8</td>
<td>Facility Management Storage 305A from Board Room 305</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Facility Management Storage 305A</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Electrical &amp; IT Room 302</td>
</tr>
<tr>
<td>8</td>
<td>Utility Room 302A from Electrical &amp; IT Room 302</td>
</tr>
<tr>
<td>13</td>
<td>Side Attic from Break Room 306</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Flex Office 304A</td>
</tr>
<tr>
<td>8</td>
<td>Storage 304B1 from Executive Director’s Office 304B</td>
</tr>
<tr>
<td>8</td>
<td>Storage 304B2 from Executive Director’s Office 304B</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Administrative Assistant’s Office 304C</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Storage 304B1</td>
</tr>
<tr>
<td>12</td>
<td>Side Attic from Storage 304B2</td>
</tr>
</tbody>
</table>

#### Hardware Set #2 for Conference Rooms, Copy Rooms, Break Rooms, Meeting Room, Board Room, Mechanical Closets (small):
Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Passage Lever Set, one (1) Overhead Doorstop, and Mutes:

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1F</td>
<td>Conference Room 101C (1 of 2) from Corridor C101</td>
</tr>
<tr>
<td>1F</td>
<td>Conference Room 101C (2 of 2) from Corridor C101</td>
</tr>
<tr>
<td>1F</td>
<td>Copy Room 105D from Corridor C105</td>
</tr>
<tr>
<td>1F</td>
<td>Break Room 105E from Corridor C105</td>
</tr>
<tr>
<td>1F</td>
<td>Break Room 209 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Conference Room 211 (1 of 2) from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Conference Room 211 (2 of 2) from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Meeting Room (1 of 2) from Corridor C300</td>
</tr>
<tr>
<td>1F</td>
<td>Meeting Room (2 of 2) from Corridor C300</td>
</tr>
<tr>
<td>1F</td>
<td>Break Room 306 from Corridor C300</td>
</tr>
<tr>
<td>1</td>
<td>Break Room 306 from Vestibule 304</td>
</tr>
<tr>
<td>1F</td>
<td>Board Room 305 from Vestibule 304</td>
</tr>
<tr>
<td>3F</td>
<td>Mechanical 101F from Corridor C101</td>
</tr>
<tr>
<td>3</td>
<td>Mechanical 105C1 from Copy Room 105D</td>
</tr>
<tr>
<td>7</td>
<td>Mechanical 112D from Corridor C112</td>
</tr>
</tbody>
</table>
**Hardware Set #2 continued**

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Mechanical 113J1 from Storage 113J</td>
</tr>
<tr>
<td>9</td>
<td>Mechanical 207A from Open Office 207</td>
</tr>
<tr>
<td>3</td>
<td>Mechanical 226 from Copy Area 224</td>
</tr>
<tr>
<td>3</td>
<td>Mechanical 307A from Facility Management Storage 307</td>
</tr>
<tr>
<td>7</td>
<td>Mechanical 305A2 from Room 305A1</td>
</tr>
<tr>
<td>3</td>
<td>Mechanical 302C from Utility Room 302A</td>
</tr>
<tr>
<td>3</td>
<td>Mechanical 304B1A from Storage 304B1</td>
</tr>
<tr>
<td>8</td>
<td>Water Heater 302B from Utility Room 302A</td>
</tr>
</tbody>
</table>

**Hardware Set #3 for Multi-Occupant Restrooms:** Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Passage Lever Set, one (1) Surface Mounted Closer with Stop, and Mutes:

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Women’s Restroom 103 from Corridor C100</td>
</tr>
<tr>
<td>1</td>
<td>Men’s Restroom 109 from Corridor C100</td>
</tr>
<tr>
<td>1F</td>
<td>Men’s Restroom 202 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Women’s Restroom 206 from Corridor C200</td>
</tr>
</tbody>
</table>

**Hardware Set #4 for Single Restrooms:** Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Privacy Lever Set, one (1) Surface Mounted Closer with Stop, and Mutes:

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>8F</td>
<td>Restroom 308 from Corridor C300</td>
</tr>
<tr>
<td>8F</td>
<td>Restroom 310 from Corridor C300</td>
</tr>
</tbody>
</table>

**Hardware Set #5 for Closed File Storage, Secure Storage, Open & Closed File Storage, Elevator Equipment Room, Server IT Telephone Room, Facility Management, Mechanical Rooms (large), Electrical & IT (Swing Doors), Janitorial Storage:** Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Keyed Storeroom Lockset, one (1) Surface Mounted Closer with Stop, and Mutes

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1F</td>
<td>Closed File Storage 101E from Corridor C101</td>
</tr>
<tr>
<td>1</td>
<td>Closed File Storage 111F from Corridor C111</td>
</tr>
<tr>
<td>1</td>
<td>Closed File Storage 112A from Corridor C112</td>
</tr>
<tr>
<td>1F</td>
<td>Closed File Storage 113B from Corridor C113</td>
</tr>
<tr>
<td>1F</td>
<td>Secure Storage 229 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Open &amp; Closed File Storage 233 from Corridor C200</td>
</tr>
<tr>
<td>8F</td>
<td>Elevator Equipment Room 108C from Corridor C108</td>
</tr>
<tr>
<td>1F</td>
<td>Server IT Telephone Room 108A from Corridor C108</td>
</tr>
<tr>
<td>1F</td>
<td>Facility Management 105C from Corridor C105</td>
</tr>
<tr>
<td>8F</td>
<td>Mechanical 204 from Corridor C200</td>
</tr>
<tr>
<td>1F</td>
<td>Electrical &amp; IT Room 302 from Corridor C300</td>
</tr>
<tr>
<td>8F</td>
<td>Janitorial 301 from Corridor C300</td>
</tr>
</tbody>
</table>

**Hardware Set #6 for Electrical, Sliding Doors:** Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Keyed Entrance / Office Lever Lockset, one (1) mounting track for sliding door(s), and Mutes

<table>
<thead>
<tr>
<th>Door</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>11F</td>
<td>Electrical 105F from Corridor C105 (pair of sliding doors)</td>
</tr>
</tbody>
</table>
Hardware Set #7 for Corridor Entry Doors: Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Classroom Lever Lockset keyed on public side, one (1) Overhead Doorstop per leaf, and Mutes:

- Door 15F Corridor C111 from Corridor C105
- Door 16F Corridor C112 from Corridor C108
- Door 15F Open Office 207 (1 of 2) from Corridor C200
- Door 15F Open Office 207 (2 of 2) from Corridor C200
- Door 15F Vestibule 304 from Corridor C300

Hardware Set #8 for Electrified Entry Doors: Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Keyed Storeroom Lever Lockset (keyed on public side), one (1) Electric Strike reusing existing building standard (fail-secure, coordinate with Owner’s existing Security Company and Electrical drawings), one (1) Proximity Reader reusing existing building standard (installed on public side, coordinate with Owner’s existing Security Company and Electrical drawings), one (1) Surface Mounted Closer with Stop, and Mutes:

- Door 1F Corridor C101 from Lobby 102
- Door 5F Corridor C105 from Corridor C100
- Door 6F Corridor C108 from Corridor C100
- Door 5F Corridor C111 from Corridor C100
- Door 5F Corridor C112 from Corridor C100
- Door 8F Server Room 201 from Corridor C200

Hardware Set #9 for Non-Electrified Stairwell Doors: Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Panic Bar on corridor side, one (1) Passage Lever on stairwell side), one (1) Surface Mounted Closer with Stop, and Mutes:

- Door 5F Stair S110 (2nd Floor) from Corridor C200
- Door 5F Stair S110 (3rd Floor) from Corridor C300

Hardware Set #10 for Electrified Stairwell Doors: Each of the following doors shall receive one (1) set of Hinges per leaf, one (1) Panic Hardware Set (panic bar on stairwell side, keyed on corridor side), one (1) Electric Strike reusing existing building standard (fail-secure, coordinate with Owner’s existing Security Company and Electrical drawings), one (1) Proximity Reader reusing existing building standard (installed on public side, coordinate with Owner’s existing Security Company and Electrical drawings), one (1) Surface Mounted Closer with Stop, and Mutes:

- Door 5F Stair S110 (1st Floor) from Corridor C100

End of Section
08 80 00 Glazing

**Part 1 – General**

**1.1 Scope**

A. The extent of glass and glazing work is indicated on the drawings and as specified herein. It shall include all labor, materials and equipment for a complete installation of all glass and glazing including all components and accessories. The required applications of glass and glazing includes, but are not necessarily limited to, the following:

1. Glazing vision panels, windows, etc.
2. Misc. glazing where indicated in drawings.

**1.2 Reference**

A. ASTM C1036 - Standard Specification for Flat Glass
B. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated
C. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass
D. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass
E. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation
F. ASTM E546 - Standard Test Method for Frost Point of Sealed Insulating Glass Units
G. ASTM E576 - Standard Test Method for Frost Point Sealed Insulating Glass Units in the Vertical Position
I. ASTM C1349 - Standard Specification for Architectural Flat Glass Clad Polycarbonate
J. ANSI Z97.1 - Performance Specifications and Methods of Test for safety Glazing Materials Used in Buildings
L. NFPA 80: Fire Doors and Windows

**1.3 Quality Assurance**

A. Glass Thickness: If not specifically called out, provide thickness of glass as required to meet local Building Code wind load (pounds/ square foot) requirements, but not less than 1/4".
B. Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.
C. Identification: Provide each piece of glass with manufacturer's label designating glass type and thickness. Each piece of tempered glass shall have permanent identification etched or ceramic fired on the glass, which shall be visible when the glass is installed.
E. Prime Glass Standard: Comply with ASTM C1036.
F. Heat-Treated Glass Standard: Comply with ASTM C1048 (Kind FT for tempered and Kind HS for heat-strengthened).
G. Laminated Glass Standard: Refer to prime glass and heat treated glass requirements relating to properties of glass making up laminated glass products.
H. Manufacturer/ Fabricator of Glass:
   1. Viracon, Inc.
   2. PPG Industries, Inc.
1.4 Submittals

A. Product Data: Submit copies of manufacturer's specifications and product data for glass and glazing products and installation, handling, storing, cleaning, and protecting instructions for each type of glass required. Provide product data indicating assembled R Value, U Value and Solar Heat Gain coefficient.

B. Testing Data: Submit copies of manufacturer's current testing reports for compliance with severe windstorm design criteria for exterior cladding and compliance with fire rated glazing meeting the specified minute rating.

C. Glazing Samples: Submit samples of each type of glazing specified for selection and approval by Architect.

1.5 Job Conditions

A. The glazier must examine the framing and glazing channel surfaces, backing, removable stop design and the conditions under which the glazing is to be performed and notify the General Contractor and Architect in writing of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the glazing until unsatisfactory conditions have been corrected in a manner acceptable to the glazier.

B. Weather Conditions: Do not proceed with glazing under adverse weather conditions or when temperatures are below or above manufacturer's recommended limitations for installation.

Part 2 - Products

2.1 Heat-Treated (Tempered) Glass

A. Heat-Treated Glass Standard: Provide heat-treated glass which complies with ASTM C1048 requirements, including those indicated by reference to kind, condition, type, quality, class, and, if applicable, form, finish, and pattern. Tempered glass shall comply with ANSI Z97.1 and 16 CFR Part 1201, Category II.

B. Manufacturing Process: Manufacture tempered glass by horizontal (roller hearth) process with roll wave distortion parallel with bottom edge of glass as installed.

C. Clear Tempered Glass: Uncoated clear heat-treated float glass, Condition A (uncoated surfaces), Type I (transparent glass, flat), Class 1 clear, Quality Q3 (glazing select), Kind FT (fully tempered).

2.2 Fabrication

A. Sizes: Fabricate glass to sizes required for glazing openings indicated, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of glass manufacturer. Provide thicknesses indicated or, if not otherwise indicated, as recommended by glass manufacturer for application indicated.

2.3 Glazing Sealants/ Compounds

A. General:

1. Provide exposed glazing materials of color to match the framing system. Provide hardness of materials as recommended by the manufacturer for the required application and condition of installation in each case. Provide only compounds which are approved to be fully compatible with surfaces contacted.

2. Heel-Bead Compound: Solvent-based, acrylic terpolymer, thermoplastic sealant; 95 percent of solids acrylic; compounded specially for glazing; complying with FS TT-2-00230, Class B, Type II.

3. Silicone Sealant: See Section 07 90 00 Joint Protections (Sealants).
2.4 Miscellaneous Glazing Materials

A. Setting Block: Neoprene, EPDM, or silicone, 70-90 Shore A durometer hardness, with tested compatibility with sealants used.
B. Spacers: Neoprene, 40-50 durometer hardness, with proven compatibility with sealants used.
C. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.
D. Glazing Tape: Manufacturer's standard preformed solvent-free butyl-polyisobutylene formulation with a solids content of 100 percent or closed cell polyvinyl chloride (pvc) foam. Comply with AAMA A804.1.

Part 3 - Execution

3.1 Standards and Performance

A. Watertight and airtight installation of each piece of glass is required. Each installation must withstand normal temperature changes, wind loading, impact loading (for exterior doors, lites, transoms, clerestories, and windows) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the work.
B. Protect glass from edge damage at all times during handling, installation and operation of the building.
C. Glazing channel dimensions as shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate sealant thicknesses, with reasonable tolerances. The glazier is responsible for correct glass size for each opening, within the tolerances and necessary dimensions.
D. Comply with combined recommendations of glass manufacturer and manufacturer of sealants and other materials used in glazing, except where more stringent requirements are shown or specified, and except where manufacturer's technical representatives direct otherwise.
E. Comply with "Glazing Manual" by Flat Glass Marketing Association except as shown and specified otherwise and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.
F. Inspect each piece of glass immediately before installation and eliminate any which have observable edge damage or face imperfections.
G. Cut and install tinted glass as recommended by the manufacturer.

3.2 Preparation for Glazing

A. Inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for existence of minimum required face or edge clearances; and for effective sealing of joints. Do not proceed with glazing work until unsatisfactory conditions have been corrected.
B. Clean the glazing channel, or other framing members to receive glass immediately before glazing.
C. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.
D. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

3.3 Glazing

A. Tempered Glazing: Tempered glass shall be provided in all locations as indicated AND wherever required to comply with applicable Federal, State, and Local Codes (whether or not specifically shown in drawings).
B. Glazing Methods:
1. Clear Glass: Unless otherwise shown in drawings, all building interior glass shall be clear. Refer to drawings and bring any discrepancies to the attention of the Architect for clarification prior to bidding.
2. Glaze fixed glass framing using resilient gaskets and snap-in stops (where appropriate) supplied by the window framing manufacturer.
3. Doors: Set glass using glazing tape at both glass faces, with removable stops supplied by door manufacturer.
4. Install setting blocks of proper size in sill rabbet, located at 1/4th of glass width from each corner. Set blocks in thin course of the heel-bead compound.
5. Provide spacers inside and out and of proper size and spacing for all glass sizes larger than 50 unified inches, except where gaskets are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
6. Do not attempt to cut, seam, nip or abrade glass which is tempered. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs, including embedment of gasket tail in cured heel bead.
7. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing so that gaskets will not pull away from corners and result in voids or leaks in the glazing system.

3.4 Cure, Protection and Cleaning

A. Cure glazing sealants and compounds in compliance with manufacturer's instructions and recommendations to obtain high early bond strength, internal cohesive strength, and surface durability.
B. Protect glass from breakage immediately upon installation by attachment of crossed streamers to framing held away from glass. Do not apply markers of any type to surfaces of glass.
C. Remove and replace glass which is broken, chipped, cracked, abraded, or damaged in other ways during the construction period, including natural causes, accidents and vandalism.
D. Maintain glass in a reasonably clean condition during construction so that it will not be damaged by corrosive action and will not contribute (by wash off) to the deterioration of glazing materials and other work.
E. Wash and polish glass on both faces not more than four (4) days prior to Owner's acceptance of the work in each area. Comply with glass manufacturer's recommendations.

End of Section
09 21 16 Gypsum Wallboard Assemblies

Part 1 – General

1.1 Related Documents

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

1.2 Section Includes

A. Performance criteria for gypsum board assemblies.
B. Metal stud wall framing.
C. Metal channel ceiling framing.
D. Acoustic insulation.
E. Gypsum sheathing.
F. Gypsum wallboard.
G. Joint treatment and accessories.
H. Textured finish system.
I. Water-resistive barrier over exterior wall sheathing.

1.3 Related Requirements

A. Section 07 2100 - Thermal Insulation: Acoustic insulation.
B. Section 07 1326 - Weather Barriers: Water-resistive barrier over sheathing.
C. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.
D. Section 07 9005 - Joint Sealers: Acoustic sealant.
E. Section 09 2216 - Non-Structural Metal Framing.
F. Section 09 3000 - Tiling (Tile): Tile backing board.

1.4 Reference Standards

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
H. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2011.
S. ASTM E413 - Classification for Rating Sound Insulation; 2010.
U. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.

1.5 Submittals
A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
B. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.
C. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
D. Product Data: Provide manufacturer’s data on partition head to structure connectors, showing compliance with requirements.
E. Test Reports: For all stud framing products that do not comply with ASTM C645 or C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.6 Quality Assurance
A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of documented experience.
B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

Part 2 – Products

2.1 Gypsum Board Assemblies
A. Provide completed assemblies complying with ASTM C840 and GA-216.
   1. See PART 3 for finishing requirements.
B. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
C. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.

2.2 Metal Framing Materials
A. Manufacturers - Metal Framing, Connectors, and Accessories:
   3. Substitutions: See Section 01 60 00 - Product Requirements.
B. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C shaped.
   4. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
   5. Resilient Furring Channels: 1/2 inch (12 mm) depth, for attachment to substrate through one leg only.
      a. Manufacturers - Resilient Furring Channels:
         1) Same manufacturer as other framing materials.

C. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

D. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Deflection and Firestop Track:
      a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
      b. Acceptable Products:
         1) "Posi Clip" by Fire Trak Corporation.
         2) "The System" by Metal-Lite, Inc.

2.3 Board Materials

A. Manufacturers - Gypsum-Based Board:
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Glass mat faced gypsum panels as defined in ASTM C1658/C1658M, suitable for paint finish, of the same core type and thickness may be substituted for paperfaced board.
   3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
   4. Thickness:
      a. Vertical Surfaces: 5/8 inch (16 mm).
      b. Ceilings: 5/8 inch (16 mm).
      c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.
   5. Paper-Faced Products:
      a. Georgia-Pacific Gypsum; ToughRock.
      b. USG Corporation;
      c. National Gypsum Co.;
      d. Substitutions: See Section 01 6000 - Product Requirements.
   6. Mold-Resistant Paper-Faced Products:
      a. Georgia-Pacific Gypsum; ToughRock Mold-Guard.
      b. National Gypsum Company; Gold Bond XP Gypsum Board.
c. USG Corporation; SHEETROCK Brand HUMITEK panels.

C. Abuse-Resistant Wallboard:
1. Application: High-traffic areas indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Glass Mat-Faced Type: Gypsum wallboard as defined in ASTM C1658/C1658M.
4. Type: Fire-resistance rated Type X, UL or WH listed.
5. Thickness: 5/8 inch (16 mm).
7. Products:
   a. USG Corporation; Mold Tough AR Fire-Code Abuse-Resistant Gypsum Panels.
   c. Substitutions: See Section 01 6000 - Product Requirements.

D. Backing Board For Wet Areas: One of the following products:
1. Application: Surfaces behind tile in wet areas including tub and shower surrounds, and shower ceilings.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
   a. Standard Type: Thickness 1/2 inch (12.7 mm).
   b. Products:
      1) Georgia-Pacific Gypsum; DensShield Tile Backer.
      2) National Gypsum Company; Gold Bond eXP Tile Backer.
   c. Substitutions: See Section 01 6000 - Product Requirements.

E. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
4. Core Type: Type X, as indicated.
5. Type X Thickness: 5/8 inch (16 mm).
6. Edges: Square, for vertical application.
7. Glass Mat Faced Products:
   a. Georgia-Pacific Gypsum; DensGlass Sheathing.
   b. National Gypsum Company; Gold Bond eXP Sheathing.
   c. USG Corporation; Securock.
   d. Substitutions: See Section 01 6000 - Product Requirements.

2.4 Accessories

A. Acoustic Insulation: ASTM C665; mineral wool batt, friction fit type, unfaced.
1. Locate as indicated on the drawings.
2. Thickness: 3 inches (76 mm).
4. Manufacturers:

B. Acoustic Sealant: As specified in Section 07 9005.

C. Finishing Accessories: ASTM C1047, galvanized steel, unless otherwise indicated.
1. Types: As detailed or required for finished appearance.
2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead and L-bead at exposed panel edges.
D. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   3. Chemical hardening type compound.

E. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

F. Textured Finish Materials: Latex-based compound; plain.

G. Screws for Attachment to Steel Members Less Than 0.03 inch (0.7 mm) in Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.

H. Screws for Attachment to Steel Members From 0.033 to 0.112 inch (0.8 to 2.8 mm) in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.

I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

---

Part 3 – Execution

3.1 Examination

A. Verify that project conditions are appropriate for work of this section to commence.

3.2 Framing Installation

B. Metal Framing: Install in accordance with ASTM C754 and manufacturer’s instructions.

C. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
   1. Level ceiling system to a tolerance of 1/1200.
   2. Laterally brace entire suspension system.
   3. Install bracing as required at exterior locations to resist wind uplift.

D. Studs: Space studs as permitted by standard.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer’s instructions.
   3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer’s instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

E. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

F. Standard Wall Furring: Install at concrete, masonry, and plastered walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 16 inches (406.4 mm) on center.
   2. Spacing: At 16 inches (400 mm) on center.

G. Acoustic Furring: Install resilient channels at maximum 24 inches (600 mm) on center. Locate joints over framing members.

H. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

I. Blocking: Install mechanically fastened steel sheet blocking for support of:
   1. Wall mounted cabinets.
   2. Plumbing fixtures.
   3. Toilet partitions.
   4. Toilet accessories.
5. Wall mounted door hardware.

3.3 Acoustic Accessories Installation

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.

3.4 Board Installation

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
   1. Exception: Tapered edges to receive joint treatment at right angles to framing.
C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.
D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
E. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
F. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Seal joints, cut edges, and holes with water-resistant sealant.
G. Installation on Metal Framing: Use screws for attachment of all gypsum board.
H. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.5 Installation of Trim and Accessories

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
   1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
B. Corner Beads: Install at external corners, using longest practical lengths.
C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.6 Joint Treatment

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
6. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).
   2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
   3. Taping, filling and sanding is not required at base layer of double layer applications.

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

F. Fill and finish joints and corners of cementitious backing board as recommended by manufacturer.

3.7 Texture Finish

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer’s instructions and to match approved sample.

3.8 Tolerances

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

End of Section
Part 1 – General

1.1 Summary

A. This Section includes the following:

   1. Wall & Floor tile.
   2. Waterproof membrane for thin-set tile installations.
   3. Crack-suppression membrane for thin-set tile installations.
   4. Cementitious backer units installed as part of tile installations.
   5. Edge protection installed as part of tile installations.

B. Related to the following sections:

   1. Section 07 90 00 “Joint Protections (Sealants).”
   2. Section 09 21 16 “Gypsum Wallboard Assemblies.”

1.2 Performance Requirements

A. Dynamic Coefficient of Friction (DCOF): For tile installed on walkway surfaces, provide products
with the following values as determined by testing identical products per ANSI A137.1-2012:

   1. Level Surfaces: Minimum 0.42 wet.
   2. Exterior Applications: Minimum 0.60 wet.
   3. Ramps and Inclines: Minimum 0.65 wet

1.3 Submittals

A. Product Data: For each 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.

C. Samples:

   1. Submit a minimum of 12 by 12 inch of each type, composition, color, and finish of tile.
   2. Assembled samples with grouted joints for each type, composition, color, and finish of
      tile.
   3. Provide a minimum of 12 by 12 inch cementitious backer unit and waterproofing
      membrane.

D. Acceptance of Substrate: Provide letter of substrate acceptance, signed by Contractor,
Manufacturer and Installer as required in Part 3 – Execution, of this specification.

1.4 Quality Assurance

A. Source Limitations for Setting and Grouting: Obtain ingredients of a uniform quality for each
mortar, adhesive, and grout component from a single manufacturer and each aggregate from
one source or producer.
1.5 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.

1.6 Warranty
   A. Special Project Warranty: Submit flooring Installer’s Warranty, on warranty form at the end of this section, signed by Installer, covering Work of the Section, for the following warranty period.
      1. Warranty Period: 2 years from date of substantial completion.

1.7 Extra Materials
   A. Furnish extra materials described below that match 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.

Part 2 – Products
2.1 Tile Products
   A. Manufacturers:
      1. Floor Tile
         a. DalTile Volume 1.0 Glazed Porcelain Floor Tile with StepWise Technology (Basis-of-Design), see drawings for location.
            i. Tile shall have a dynamic coefficient of friction (DCOF) greater than or equal to 0.60.
            ii. Up to four (4) colors will be selected by the Architect and Owner from the Manufacturer’s full color line in any of the available Price Groups.
            iii. Miscellaneous shapes and trims from the Manufacturer’s profiles shall be installed for a complete, color- and pattern-coordinated installation.
         b. American Olean Solstice Colorbody & Glazed Porcelain Floor Tile with StepWise Technology.
            i. Tile shall have a dynamic coefficient of friction (DCOF) greater than or equal to 0.60.
            ii. Up to four (4) colors will be selected by the Architect and Owner from the Manufacturer’s full color line in any of the available Price Groups.
            iii. Miscellaneous shapes and trims from the Manufacturer’s profiles shall be installed for a complete, color- and pattern-coordinated installation.
      2. Wall Tile
         a. DalTile Linear Color Wheel Collection Glazed Ceramic Tile (Basis of Design), see drawings for location.
            i. Up to four (4) colors will be selected by the Architect and Owner from the Manufacturer’s full color line in any of the available Price Groups.
            ii. Up to two (2) patterns will be selected by the Architect and Owner from any of the Manufacturer’s published Standard Patterns.
            iii. Miscellaneous shapes and trims from the Manufacturer’s profiles shall be installed for a complete, color- and pattern-coordinated installation.
         b. American Olean Color Story Wall Glazed Ceramic Tile, see drawings for location.
i. Up to four (4) colors will be selected by the Architect and Owner from the Manufacturer’s full color line in any of the available Price Groups.

ii. Up to two (2) patterns will be selected by the Architect and Owner from any of the Manufacturer’s published Standard Patterns.

iii. Miscellaneous shapes and trims from the Manufacturer’s profiles shall be installed for a complete, color- and pattern-coordinated installation.

2.2 Accessory Materials

A. Waterproofing Membranes for Tile Installation: Manufacturer’s standard polyethylene waterproofing membrane product that complies with ANSI A118.10, selected from the following:

1. Schluter Systems L.P.; Schulte-KERDI or Architect approved equal.
   a. Provide at wall application in shower and wet locations.
   b. Provide pre-cut sections for inside and outside corners and for pipe collars. Seal all butt and corner joints.
   c. Use floor drain with integrated bonding flange.
   d. Coordinate installation of resinous flooring with wall tile.

B. Movement and Control joints: Provide a movement joint profile with edge protection.
   1. Schluter Systems L.P.; Schulte-Dilex-KS
   2. MAPEI Corporation.
   3. Architect approved equal.

2.3 Setting and Grouting Materials

A. Setting and Grouting Epoxy: Epoxy mortar and grout shall meet or exceed requirements of ANSI A118.3. Mortar and grout material shall be 100% solids epoxy compound for setting and grouting tile as specified. Mortar and grout shall be sag-resistant and have bond strength greater than 1000 psi.

1. Manufacturer/Products:
   a. LATICRETE International Inc. (Basis-of-design).
      1) Mortar: LataPox 300 Adhesive
      2) Grout: Permacolor Grout
   b. Approved equal.

2. Substrate shall be prepared in accordance with ANSI A108.4 and must be structurally sound, dry, free of sealers, coatings, oil, dire and dust.

3. Provide a full coverage of setting material on the back of the tile as recommended per The National Tile Contractors Association. Apply mortar to substrate using the trowel to fill any voids and key the material to the substrate. The mortar shall be comb evenly in one direction only.

4. Grout shall be forced into joints using sufficient pressure and flow to avoid air pockets or voids. Grout width as specified.

2.4 Tile Backing Panels

A. Cementitious Backer Units: Comply with ANSI A108.1.

1. Products: Subject to compliance with requirements, provide one of the following:
   c. Georgia Pacific; Denshield.
   d. James Hardi Co.; Hardibacker.
   e. Certainteed; Glassrock.


3. Location: Provide in the showers and walls to receive tile, as indicated on the Drawings.
B. Tape and Joint Compound for Tile Backing Panels:

1. Joint Treatment Material: Provide materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
   a. For filling joints and treating fasteners of cementitious backer units for application of Porcelain tile, use materials recommended by the board manufacturer.
2. Joint Tape for Cementitious Backer Units: Coated, alkali-resistant glass-fiber mesh tape.
3. Joint Compound for Cementitious Backer Unit: Material recommended by cementitious backer unit manufacturer.
4. Fasteners: Provide noncorrosive and nonoxidizing hot-dip zinc coated applied to carbon and alloy steel fasteners complying with ASTM F2329-11 for wet areas.

2.5 Miscellaneous Materials

A. Elastomeric Sealants: Elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Section 07 90 00 "Joint Protections (Sealants)."*

1. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
2. One-Part, Mildew-Resistant Silicone: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for in-service exposures of high humidity and extreme temperatures.
   a. Products:
      1) Dow Corning Corporation; Dow Corning 786.
      2) GE Silicones; Sanitary 1700.
      3) Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
      4) Tremco, Inc.; Tremsil 600 White.
3. Multipart, Pourable Urethane Sealant for Use T: ASTM C 920; Type M; Grade P; Class 25; Uses T, M, A, and, as applicable to joint substrates indicated, O.
   a. Products:

C. Trowelable Underlayments and Patching Compounds: Latex-modified, Portland cement-based formulation provided or approved by manufacturer of tile-setting materials.

D. Edge Protection: Provide Schluter – Schiene or EQUAL, edge protection product for wall tile as indicated on the drawings.

1. Description: L-shaped profile with 1/8" (3.2 mm) wide top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.
2. Material and Finish: AE - Satin Anodized Aluminum
3. Proper design and installation as recommended by Manufacturer.

E. Floor Transitions: Provide Schluter – Reno, Reno TK and Schiene or EQUAL, transition product for floor tile as indicated on the drawings.
1. Reno Description: ADA compliant sloped profile top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.

2. Schiene Description: L-shaped profile with 1/8" (3.2 mm) wide top section and vertical wall section that together form the visible surface, integrated trapezoid-perforated anchoring leg, and integrated grout joint spacer.

3. Material and Finish: AE - Satin Anodized Aluminum

4. Proper design and installation as recommended by Manufacturer.

Part 3 – Execution

3.1 Preparation

A. Framing: Support framing shall be designed for a maximum allowable assembly deflection of L/360. Coordinate and comply with Division 09 Section “Non-Structural Metal Framing.”

B. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.

C. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer’s written instructions.

D. Remove protrusions, bumps, and ridges by sanding or grinding.

E. Blending: For tile exhibiting color variations, use factory blended tile or blend tiles at Project site before installing.

F. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, pre-coat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.2 Installation, General

A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Porcelain Tile" that apply to types of setting and grouting materials and to methods indicated in Porcelain tile installation schedules.


C. 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.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.

E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
F. Movement and Control Joints: Locate expansion joints and other sealant-filled joints during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.
   1. Prepare joints and apply sealants to comply with requirements in Division 07 Section "Joint Sealants."
   2. Provide joints at the following locations unless indicated otherwise on the drawings.
      a. Provide joints as recommended per TCA, Handbook for Porcelain Tile Installation.
      b. Locate joints in tile surfaces directly above joints in substrates expansion, control and construction joints.
      c. Interior locations joints shall not exceed 20 feet in either direction.
      d. Joints should be installed with tilework abuts retraining surfaces such as perimeter walls, dissimilar floors, columns, etc.

F. Grout tile to comply with requirements of ANSI A108.10, unless otherwise indicated.
   1. For chemical-resistant epoxy grouts, comply with ANSI A108.6.

G. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
   1. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

H. Install tile on floors and walls with the following joint widths:
   1. 1/8 inch (3.175 mm), unless noted otherwise.

I. Apply grout sealer to grout joints in tile walls according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints, remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.3 Applying Tile Backing Panels

A. Cementitious Backer Units: ANSI A108.1, at showers and locations indicated to receive tile.

B. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

C. Cementitious Backer Units: Finish according to manufacturer’s written instructions.

3.4 Wall Tile Installation Schedule

A. Porcelain Tile Wall Installation: Where interior wall installations of this designation are indicated, comply with the following:
   1. Tile Type: Porcelain wall tile.
   2. Installation Method: TCNA W244E-09 (Epoxy mortar and grout over cementitious backer unit).
   3. Requirements:
      a. Stud Spacing: Maximum 16-inches on center.
      b. Stud Depth: Minimum 3-1/2-inches.
      c. Metal Studs: Provide 20 gage (0.039-inch) or heavier.
   4. Cementitious Backer Units: Comply with ANSI A118.9 or ASTM C1325 (Type B).
      a. Maximum variation in the backing surface: 1/4-inch in 10 feet and 1/16-inch in 1 foot from the required plane.
      b. Horizontal joints: 1/8-inch spacing filled solid with mortar.
c. Tape: Provide 2-inch alkali-resistant glass fiber mesh tape embedded in a skim coat of mortar over joints and corners.

5. Membrane: Comply with ANSI A108.02-3.8 at shower application.


3.5 Floor Tile Installation Schedule

A. Ceramic Tile Floor Installation: Where interior floor installations of this designation are indicated, comply with the following:

1. Tile Type: Porcelain floor tile.
2. Installation Method: TCNA F131-09 (Epoxy mortar and grout over concrete subfloor).
3. Requirements:
   a. Slab to be well cured, dimensionally stable, and free of cracks, sealer, waxy or oily films, and curing compounds.
   b. Preparation by other trades:
      1) Slab shall be steel trowel and fine broom finish free of curing compounds.
      2) Maximum variation in the slab: 1/4-inch in 10 feet and 1/16-inch in 1 foot from the required plane.
4. Setting Bed and Grout: ANSI A118.3 epoxy mortar and grout.

Part 4 – Installer’s Warranty form to follow.
Part 4 - Installer's Warranty

4.1 Flooring Installer's Warranty

A. WHEREAS _____________________________________________ of ____________________________, herein called the “Flooring Installer,” has performed flooring and associated work (“work”) on the following project:

1. Owner: ________________________________________________
2. Address: ______________________________________________
3. Building Name/Type: ________________________________
4. Address: ______________________________________________
5. Area of Work: _________________________________________
6. Acceptance Date: ______________________________________
7. Warranty Period: ______________________________________
8. Expiration Date: _______________________________________

B. AND WHEREAS Flooring Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against faulty or defective materials and workmanship for designated Warranty Period.

C. NOW THEREFORE Flooring Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in an acceptable condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
   a. act of God;
   b. Failure of flooring system substrate, (not installed by flowing contractor, including cracking, settlement, deterioration, and decomposition;
   c. Activity on flowing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired by Flooring Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.

3. Flooring Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from faults or defects of work.

4. During Warranty Period, if Owner allows alteration of work by anyone other than Flooring Installer, including cutting, patching, and maintenance in connection with attachment of other work, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Flooring Installer to perform said alterations, Warranty shall not become null and void unless Flooring Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. Owner shall promptly notify Flooring Installer of observed, known, or suspected defects, or deterioration and shall afford reasonable opportunity for Flooring Installer to inspect work and to examine evidence of such defects, or deterioration.

6. This Warranty is recognized to be the only warranty of Flooring Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of flooring failure. Specifically, this Warranty shall not operate to relieve Flooring Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner’s General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this ________________
day of ________________, 20_____.

1. Authorized Signature: __________________________________
2. Name: _____________________________________________
3. Title: _____________________________________________

End of Section
09 51 13 Acoustical Ceiling System

Part 1 – General

1.1 Summary

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

1.2 Submittals

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

B. Coordination and Shop Drawings: Drawings shall be produced by General Contractor, coordinating with ceiling, mechanical, and electrical disciplines. Drawn to scale and coordinating acoustical panel ceiling installation with hanger attachment to building structure and ceiling mounted items:
   1. Ceiling suspension assembly members.
   2. Method of attaching hangers to building structure.
   3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels and special moldings.

C. Samples: For each acoustical panel, for each exposed suspension system member, for each exposed molding and trim and for each color and texture required.
   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 12-inch-long sample of each type, finish and color.

D. Product test reports.

E. Research/evaluation reports.

F. Maintenance data.

1.3 Quality Assurance

A. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.

B. Fire-Test-Response Characteristics:
   1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
      a. Identify materials with appropriate markings of applicable testing and inspecting agency.
   2. Surface-Burning Characteristics: Acoustical panels complying with ASTM E 1264 for Class A materials, when tested per ASTM E 84.
      a. Smoke-Developed Index: 450 or less.

C. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
   1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Preinstallation Conference: Conduct conference at Project site.

1.4 Project Conditions

A. Environmental Limitation: 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 levels indicated for Project when occupied for its intended use.
B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.

1.5 Coordination
A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.6 Extra Materials
A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents. Provide a minimum of 5% of ceiling area in whole tiles for extra materials.

1.7 Warranty
A. Manufacturer shall warrant all components of the acoustical ceiling system against failure associated with humidity including sagging, warping, and rusting for a period of thirty (30) years.

Part 2 - Products

2.1 Manufacturer
A. Products: Subject to compliance with requirements, provide the followings:
   1. Armstrong Ceilings (Basis-of-Design)
      a. Tile: Ultima
      b. Edge Style: Beveled Tegular
      c. Color: White
      d. Size: 24 in x 24 in.
      e. Delivery: Ships within five (5) days expedited lead-time program through Armstrong Kanopi platform.
   B. Prior approved equal: Must meet all features of the Basis of Design Product, including an expedited lead-time program.

2.2 Acoustical Panel Ceilings, General
A. Acoustical Panel Standard: Comply with ASTM E 1264.
B. Metal Suspension System Standard: Comply with ASTM C 635.
C. Attachment Devices: Size for five times the design load indicated in ASTM C 635, Table 1, "Direct Hung," unless otherwise indicated. Comply with seismic design requirements.
   a. Anchors in Concrete: Cast-in-place or Expansion anchors fabricated from corrosion-resistant materials, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to five times that imposed by ceiling construction, as determined by testing per ASTM E 488 or ASTM E 1512 as applicable, conducted by a qualified testing and inspecting agency.
   b. Power-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.
D. Wire Hangers, Braces, and Ties: Zinc-coated carbon-steel wire; ASTM A 641/A 641M, Class 1 zinc coating, soft temper.
   1. Size: Select wire diameter so its stress at 3 times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch (2.69-mm-) diameter wire.
E. Antimicrobial Fungicide Treatment: Provide acoustical panels with face and back surfaces coated with antimicrobial treatment consisting of manufacturer’s standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273 and evaluated according to ASTM D 3274 or ASTM G 21.

F. Provide Hanger Rods or Flat Hangers from mild steel, zinc coated or protected with rust-inhibitive paint as required.

G. Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer’s standard moldings for edges and penetrations that comply with seismic design requirements; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
   1. Provide manufacturer’s standard edge moldings that fit acoustical panel edge details and suspension system indicated and that match width and configuration of exposed runners, unless otherwise indicated.
   2. For lay-in panels with reveal edge details, provide stepped edge molding that forms reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
      a. Provide the following products along walls when reveal edge panels require being cut. Panel shall be cut straight to fit within the area.
   3. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.

2.3 Acoustical Panels For Acoustical Panel Ceiling (Act-1)

A. Basis-of-Design Product: Subject to compliance with requirements, provide Armstrong Ceilings; Product: Ultima Acoustical Panels, Ultima No. 1911 or a comparable product, approved by the Architect.
B. Color: White.
C. LR: Not less than 0.88
D. NRC: Not less than 0.75
E. CAC: Not less than 35
F. Edge/Joint Detail: Beveled Tegular
G. Thickness: 3/4 inch (19 mm)
H. Modular Size: 24 by 24 inches (610 by 610 mm).
I. Antimicrobial Treatment: Manufacturer’s standard fungicide and bactericide product to retard the growth of mold/mildew.
J. Suspension System: Armstrong Prelude XL 15/16-inch exposed grid.
K. Location: See ceiling plans for locations.

2.4 Metal Suspension System for Acoustical Panel Ceiling

A. Wide-Faced Double-Web, Fire-Rated Steel Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653/A 653M, not less than G30 (Z90) coating designation, with prefinished 15/16-inch- wide metal caps on flanges.
   2. End Condition of Cross Runners: Butt-edge type.
Part 3 – Execution

3.1 Installation

A. Comply with ASTM C 636 per manufacturer’s written instructions and CISCA’s "Ceiling Systems Handbook."

B. 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 and comply with layout shown on reflected ceiling plans.

C. Suspend ceiling hangers from building's structural members, plumb and free from contact with insulation or other objects within ceiling plenum. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers, use trapezes or equivalent devices. 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.
   1. Do not support ceilings directly from permanent metal forms or floor deck; anchor into concrete slabs.
   2. Do not attach hangers to steel deck tabs or to steel roof deck.
   3. Space hangers not more than 48-inches (1200 mm) o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8-inches (200 mm) from ends of each member.
   4. 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. Fasten bracing wires into concrete with cast-in-place or post-installed anchors.

E. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels. Screw attach moldings to substrate at intervals not more than 16 inches (400 mm) o.c. and not more than 3 inches (75 mm) from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet (3.2 mm in 3.6 m). Miter corners accurately and connect securely.

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

G. 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.

End of Section
Part 1 – General

1.1 Summary
   A. Section Includes:
      1. Luxury Vinyl Tile
      2. Rubber Base and Accessories
   B. Coordinate and provide transition strip as required at changes in flooring.

1.2 Submittals
   A. Product Data: For each type of product indicated.
   B. Shop Drawings: For each type of floor tile. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.
   C. Samples: Samples of each color and pattern of floor tile required.
   D. Maintenance data.

1.3 Quality Assurance
   A. Installers Qualifications: A Qualified installer who employs workers for this project who are competent in techniques required by manufacturers for floor tile installation method indicated.
   B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
      1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.4 Project Conditions
   A. Maintain ambient temperatures within range recommended by manufacturer in spaces to receive floor tile.
   B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer.
   C. Close spaces to traffic during floor tile installation.
   D. Close spaces to traffic for 48 hours after floor tile installation.
   E. Install floor tile after other finishing operations, including painting, have been completed.

1.5 Extra Materials
   A. Furnish extra materials matching products installed. Package with protective covering for storage with labels clearly describing contents.
      A. Quantity: Furnish not less than 1 box for each 50 boxes or fraction thereof, of each color, pattern and size of resilient floor tile installed.

1.6 Warranty
   A. Manufacturer’s Warranty: Manufacturer to provide Limited Commercial Warranty for luxury vinyl tile. The warranty period shall be a minimum of 20 years after Substantial Completion.
   B. Special Project Warranty: Submit flooring Installer’s Warranty, on warranty form at end of this Section, signed by Installer, covering Work of this Section, for the following warranty period.
      1. Warranty Period: 2 years from date of Substantial Completion.

Part 2 – Products

2.1 Luxury Vinyl Tile
   A. Products: Subject to compliance with requirements, provide the following:
1. Mannington Amtico Signature Collection Wood Luxury Vinyl Tile (Basis-of-Design)
2. Armstrong Flooring Biome Luxury Vinyl Tile

B. Colors: Up to four (4) colors will be selected by the Architect and Owner from the Manufacturer’s full color line in any of the available Price Groups.
C. Pattern: Running bond with one-third (1/3) offset. Coordinate with Architect prior to installation.
D. Meets requirements for composition, size, thickness, squareness, flexibility, dimensional stability, and resistance to chemicals of ASTM F1700, Class III, Type B.
E. Wear Layer: 20 mils (.020-inches or .5mm) minimum
F. Static Load Limit: 2000 psi

2.2 Rubber Base and Accessories

A. Roppe Corporation
   1. Roppe Corporation 700 Series Wall Base meeting ASTM F1861 and with the following physical characteristics:
      a. Height: 4” high
      b. Shapes: Cove base, pre-formed inside corners, and pre-formed outside corners.
      c. Colors: Color to be selected by Architect from full color line. Project shall include multiple color selections; General Contractor shall figure three (3) colors.
      d. Material: Durable TPR rubber compound contains bio-based phthalate free plasticizer, from a rapidly renewable resource.
      e. Thickness: 1/8″ (3.175mm)
      f. Backing: Ribbed back for positive adhesion and top-lip design that helps base fit tightly against wall.

   2. Roppe Corporation Rubber Riser and Tread meeting ASTM F2169, Type TS.
      a. Profile:
         1. Tread: #80 Light Duty Ribbed Design with Abrasive Insert and Square Nose.
         2. Riser: 7” height, material and color to coordinate with Tread.
      b. Material: PVC-free rubber
      c. Colors: Color of resilient material and abrasive insert(s) to be selected by Architect from full color line. Project shall include multiple color selections; General Contractor shall figure three (3) colors.

B. Prior approved equal

2.3 Installation Materials

A. Trowelable Leveling and Patching Compounds: Latex-modified, Portland cement based or blended hydraulic-cement-based formulation provided by manufacturer for applications indicated.
B. Adhesives: Water-resistant type recommended by manufacturer to suit floor tile, substrate conditions indicated, and based upon the results of the Moisture Testing required in Part 3 – Execution 3.2 Preparation of this specification.

Part 3 – Execution

3.1 Examination

A. Examine substrates, areas, and conditions with Installer present, under which flooring will be applied, for compliance with requirements. Inspect application surfaces to determine that they are free from defects impairing performance or appearance of the installed materials.

3.2 Preparation

A. Prepare substrates according to 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 manufacturer. Do not use solvents.

3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

4. Moisture Testing: Perform tests recommended by floor covering manufacturer and as follows. Proceed with installation only after substrates pass testing.
   a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
   b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

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

D. Do not install floor tiles until they are same temperature as space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation and dust. Proceed with installation only after unsatisfactory condition has been corrected.

3.3 Floor Tile Installation

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

B. Pattern: Running bond with one-third (1/3) offset. Coordinate with Architect prior to installation.

C. 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 or in pattern indicated.

D. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
   1. Lay tiles with grain running in one direction in pattern of colors and sizes indicated.

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

F. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

G. 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, nonstaining, marking device.

H. Adhere floor tiles to flooring 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.

I. Install transition strips per manufacturer’s recommendations as selected by Architect.

3.4 Cleaning and Protection

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile. Perform the following operations immediately after completing resilient product installation:
   1. Remove adhesive and other blemishes from exposed surfaces.
   2. Sweep and vacuum surfaces thoroughly.
   3. Damp-mop surfaces to remove marks and soil.
      a. Do not wash surfaces until after time period recommended by manufacturer.
B. Protect resilient products from marring, marks, indentations and other damage from construction operations and placement of equipment fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

Part 4 – Installer’s Warranty form to follow.
Part 4 – Installer’s Warranty

4.1 Flooring Installer’s Warranty

A. WHEREAS ___________________________ of ___________________________, herein called the “Flooring Installer,” has performed flooring and associated work (“work”) on the following project:
   1. Owner: ___________________________________________________
   2. Address: ___________________________________________________
   3. Building Name/Type: ________________________________________
   4. Address: ___________________________________________________
   5. Area of Work: ______________________________________________
   6. Acceptance Date: ___________________________________________
   7. Warranty Period: ___________________________________________
   8. Expiration Date: ____________________________________________

B. AND WHEREAS Flooring Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against faulty or defective materials and workmanship for designated Warranty Period.

C. NOW THEREFORE Flooring Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a acceptable condition.

D. This Warranty is made subject to the following terms and conditions:

   1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:
      a. act of God;
      b. Failure of flooring system substrate, (not installed by flowing contractor, including cracking, settlement, deterioration, and decomposition;
      c. Activity on flowing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
   2. When work has been damaged by any of the foregoing causes, Warranty shall be null and void until such damage has been repaired by Flooring Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
   3. Flooring Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from faults or defects of work.
   4. During Warranty Period, if Owner allows alteration of work by anyone other than Flooring Installer, including cutting, patching, and maintenance in connection with attachment of other work, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Flooring Installer to perform said alterations, Warranty shall not become null and void unless Flooring Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. Owner shall promptly notify Flooring Installer of observed, known, or suspected defects, or deterioration and shall afford reasonable opportunity for Flooring Installer to inspect work and to examine evidence of such defects, or deterioration.

6. This Warranty is recognized to be the only warranty of Flooring Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of flooring failure. Specifically, this Warranty shall not operate to relieve Flooring Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner’s General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____________
day of ________________, 20_____.

1. Authorized Signature: __________________________________
2. Name: _____________________________________________
3. Title: ______________________________________________

End of Section
09 90 00 Painting and Coating

Part 1 – General

1.1 Scope

A. The scope of painting work in this project shall be as shown on drawings and specified herein. It shall include all labor, materials, and equipment necessary for a complete finished installation.

B. If the schedule herein requires two or more types of painting on the same substrate, the type will be distinguished by the term "paint" meaning an opaque finish (flat, satin, semi-gloss, gloss sheens) and "transparent" meaning a non-opaque, transparent finish (varnishes, stains).

1.2 Related Sections

A. Section 05 12 13 Architecturally Exposed Structural Steel Framing
B. Section 06 40 23 Interior Architectural Woodwork
C. Section 07 90 00 Joint Protectants (Sealants)
D. Section 08 12 13 Hollow Metal Frames
E. Section 08 14 16 Flush Wood Doors
F. Section 09 21 16 Gypsum Wallboard Systems
G. Shop coats on fabricated items and structural steel
H. Factory-applied finishes

1.3 Definitions

A. "Paint" as used herein means all coating systems materials, including primers, emulsions, enamels, coatings, stains, sealers, and fillers.

B. "Exposed surfaces" include portions of the completed construction which are visible when permanent and built-in fixtures and equipment are in place.

C. "Exterior" includes portions of the completed construction which are subject to outdoor ambient temperature and humidity conditions, including covered but unenclosed areas.

D. Surfaces to be Painted: Complete coverage of all exposed surfaces is intended, unless indicated "no paint" on drawings. Without restricting the extent of the work to be performed, the work shall include, but is not limited to, the following:

   1. Wood: Painting of all exposed woodwork and finish carpentry, interior and exterior, doors and of all architectural woodwork and finish carpentry, except that specified to be prefinished.
   2. Structural Steel: Touch-up after erection (concealed work only), and complete painting for all exposed work.
   3. CMU, Masonry, and Plaster: All exposed surfaces.
   4. Ferrous Metal: All exposed surfaces of all ferrous metal work, including galvanized, both exterior and interior of building, which is not finished painted under other sections, to include steel frames, steel doors, access panels, guards, lintels, gutters, gravel guards, metal flashings, railings (unless otherwise indicated), roof accessories, steel supports, sprinkler riser, roof hatch and grates, bollards, etc.
   5. Concrete Slab: Concrete sealer for slabs scheduled to remain a concrete surface.
   7. Concrete: Sidewalk curbs, handicapped ramps, site light bases, parking striping, directional arrows, etc. (when indicated on drawings).
   8. All Previously Painted Surfaces.

E. Surfaces Not to be Painted: The following areas or items will not require painting under this Section, unless otherwise noted:

   1. Concealed duct shafts, concealed spaces, concealed pipes and ducts.
   2. Acoustical tile and suspension system.
Painting and Coating 09 90 00-2

3. Pre-finished panels.
4. Structural steel work concealed by interior building finish.
5. Gypsum drywall surfaces to receive other finish materials.

1.4 Quality Assurance

A. Single Source Responsibility: Provide primers and other undercoat paint produced by the same manufacturer as finish coats. Use only thinners approved by the paint manufacturer and use only within recommended limits.
B. Compatibility: Review other Sections of these specifications in which prime paints are to be provided to ensure compatibility of total coatings system for various substrates. Upon request from other trades, furnish information on finish materials to be used, to enable use of compatible prime coats. Notify the Architect of anticipated problems using the specified materials.
C. Industry Standards: Comply with the recommendations of the Painting and Decorating Contractors of America, as contained in "PDCA Architectural Specification Manual", except where conflicting and more stringent requirements are specified in this Section.
D. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.
E. Cooperation with Other Trades: This work shall be scheduled and coordinated with other trades and shall not proceed until other work and/or project conditions are as required to achieve satisfactory results. The Contractor shall examine the Specifications for the various other trades and materials and shall thoroughly familiarize himself with all their provisions regarding painting.

1.5 Qualifications

A. Manufacturers:
   1. Basis Of Design: For purposes of designating type and quality for the work under this Section, drawings and specifications are based on products manufactured or furnished by Sherwin-Williams Company, except as noted specifically otherwise.
   2. Acceptable Manufacturers: The Owner manages multiple facilities under a single maintenance program, and the preference is to adhere to their existing standard Sherwin-Williams Company paint products for gypsum surfaces. However, products from the following approved manufacturers having equal quality to those as specified herein will be considered upon specific product review by the Architect:
      a. Benjamin Moore & Company
      b. PPG Industries
      c. Prior Approved Equal

1.6 Submittals

A. Product Data: Submit manufacturer's technical information including paint label analysis with handling, storage and application instructions for each material proposed for use. Identify purpose (primer, intermediate or finish coat) and substrate for each paint material.
B. Samples: Prior to beginning work submit samples for review of color and texture only. Provide a listing of material for each coat of each finish sample.
   1. On 12" x 12" gypsum board and CMU, provide one sample of each color and material. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved.
   2. On 12" x 12" section of plaster, provide one sample of each color and material. Resubmit samples as requested by Architect until acceptable sheen, color, and texture is achieved.
C. Provide one sample of natural and stained wood finish. Use wood samples approved for Sections 06 10 00 Rough Carpentry, 06 40 23 Interior Architectural Woodwork, and 08 14 16 Flush Wood Doors (where applicable). Label and identify each as to location and application.
D. Mockup: On completed wall surfaces and other building components, where directed by the Architect, duplicate painted finishes of approved samples. Provide full-coat finish samples on at least 100 sq. ft. of surface, until required sheen, color and texture is obtained; simulate finished
lighting conditions for review of in-place work. Do not order materials for project until field mockup approved by Architect.

1. Final acceptance of colors will be from samples applied on the job.
2. Approved on-site samples will be the standard for acceptance of the permanent work, which shall match approved samples in color, sheen, texture, hiding powers, application workmanship, and other appearance characteristics. Identify, preserve, and protect on-site samples.

1.7 Product Handling

A. Storage of Materials:
   1. Store all materials in a single place designated by the General Contractor. The storage place shall be kept neat and clean and all damage shall be made good. Remove soiled or used rags, waste, and trash from the building every night and take every precaution to avoid the danger of fire.
   2. Emulsion paints shall be protected from exposure to cold weather by storing in shelters so as to prevent freezing of the paint.

1.8 Environmental Conditions

A. Maintain temperature in building at a constant 65 degrees F or above during drying of plaster and masonry and provide adequate ventilation for escape of moisture from building in order to prevent mildew, damage to other work and improper drying of paint. Once painting has commenced, provide a constant temperature of 65 degrees F or above and prevent wide variations in temperature which might result in condensation on freshly painted surfaces.

B. Exterior painting shall not be performed when the temperature is below 50 degrees F, while the surface is damp, during cold, rain or frosty weather, or when temperature is likely to drop to freezing within 24 hours. Avoid painting surfaces while they are exposed to hot sun.

C. Cleaning Area: Before painting is started in any area, it shall be broom-cleaned and dust shall be removed from all areas to be painted. After painting operations begin in a given area, broom cleaning will not be allowed. Cleaning shall then be done only with commercial vacuum cleaning equipment.

1.9 Protection

A. Drop Cloths: Protect adjacent areas and installation by the use of drop cloths or other approved precautionary measures.

B. Hardware and Fixtures: Remove and protect hardware, accessories, device plates, lighting fixtures, factory finished work and similar items or provide ample in-place protection. Upon completion of each space, carefully replace all removed items. This work shall be done only by skilled mechanics, using adequate tools commensurate with the work to be done.

1.10 Maintenance Materials

A. Extra Stock: Provide minimum of 1 gallon of each paint type and color used. Provide in sealed, labeled containers.

Part 2 – Products

2.1 Paint Materials

A. Provide materials as specified in Painting Schedule herein. Paint shall arrive at the project site ready-mixed, except for tinting of undercoats and possible thinning. Tinting materials shall be as recommended by the manufacturer for the particular materials tinted.

2.2 Application Equipment

A. Equipment shall be adequate and commensurate for the work and workmanship required herein.
2.3 Accessory Materials

A. This shall include all required ladders, scaffolding, drop cloths, masking, scrapers, tools, sandpaper, dusters, cleaning solvents and other items required to perform the work and achieve the results herein specified.

Part 3 – Execution

3.1 Preparation of Surfaces

A. General Requirements for Preparations:
   1. Hardware, hardware accessories, machined surfaces, plates, lighting fixtures and similar items in contact with painted surfaces (and not to be painted) shall be removed (where possible), masked or otherwise protected prior to surface preparation and painting operations. Such removal and reinstalling shall be done by workmen skilled in the trades involved.
   2. Exposed nails and other ferrous metal on surfaces to be painted with water-thinned paints shall be spot-primed with zinc-dust-oxide or zinc chromate primer.
   3. Surfaces to be painted shall be clean before applying paint or surface treatments. Oil and grease shall be removed with clean cloths and cleaning solvents prior to mechanical cleaning, except when sand blasting is employed. Cleaning and painting shall be so performed that dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
   4. Paints shall be applied only to surfaces that are completely free of surface moisture as determined by sight or touch. In no case shall paint be applied to surfaces upon which there is visible frost or ice.
   5. Concrete, Masonry, And Stucco/ Plaster: Surfaces to be painted shall be prepared by removing efflorescence, chalk, dust, dirt, grease, oil, excessive mortar, unsound paint coatings, and other material detrimental to painting. Surfaces shall be thoroughly dry, properly cured and clean before application of paint. Concrete, Masonry and Stucco/ Plaster Prep.: S-W-3, S-W-4, S-W-11, and/or S-W-12.
      a. Use abrasive blast-cleaning methods if recommended by the paint manufacturer.
      b. Test alkalinity and moisture content of surfaces. If surfaces are sufficiently alkaline to cause blistering and burning of finish paint, correct this condition before application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
   6. Concrete Surfaces To Be Sealed: Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust and other foreign material to achieve adequate adhesion. Minimum substrate cure is 28 days at 75 °F. Remove all form release agents, curing compounds, salts, efflorescence, laitance, and other foreign matter by sandblasting, shotblasting, mechanical scarification or suitable chemical means. Refer to ASTM D4260. Rinse thoroughly to achieve a final pH between 6.0 and 10.0. Allow to dry thoroughly prior to coating.
      a. Surface Preparation of Concrete to be Sealed: SSPC-SP13/ NACE 6
   7. Wood Surfaces to Receive Paint Finish: Wood surfaces shall be primed and finish-coated as specified in the Painting Schedule herein. Wood surfaces to be painted shall be cleaned of dirt, oil, unsound paint coatings, and other foreign substances with mineral spirits, scrapers and/or sandpaper. Wood Prep.: S-W-23 (Exterior), S-W-24 (Interior), and/or S-W-12.
      a. After priming, all holes and imperfections in finish surfaces shall be filled with putty or plastic woodfiller, colored to match the finish coat, allowed to dry and sandpapered smooth.
      b. Unless otherwise approved, painting shall proceed only when the moisture content of the wood does not exceed 12% as measured by a moisture meter.
8. Wood Surfaces to Receive Transparent Finish: Except as hereinafter specified, prepare properly to the approved shade. Lightly sand each varnish coat prior to application of subsequent coat.

9. Ferrous Surfaces: Surfaces that have not been shop-coated shall be solvent cleaned to remove oil and grease. Surfaces that contain loose rust, loose mill scale, unsound paint coatings, and other foreign substances shall be mechanically cleaned by power wire-brushing or sandblasting in accordance with SSPC specifications. Minor amounts of residual rust that cannot be removed by applying a sharp knife to any edge will be permitted. Ferrous Surfaces Prep.: S-W-13 through S-W-15 (as applicable) and/or S-W-12.

   a. After cleaning, apply one coat of ferrous metal primer to all ferrous surfaces that are to receive paint. Protect shop-coated metal from corrosion before and after installation by treating corroded areas immediately upon detection. Abraded or corroded spots on shopcoated surfaces shall be wire brushed and touched up with the same materials as the shop coat. All edges of repair shall be carefully feathered out on exposed surfaces.

10. Galvanized Metals: Surfaces shall be solvent-cleaned, treated, and otherwise prepared in accordance with the paint manufacturer's directions. Galvanized Surfaces Prep.: S-W-10 and/or S-W-12.

11. Aluminum and Aluminum-Alloy: Surfaces shall be solvent cleaned to remove oil and grease and then treated in accordance with paint manufacturer's directions before painting. Aluminum Prep.: S-W-1 and/or S-W-12.


13. Previously Coated Surfaces: Maintenance painting will frequently not permit or require complete removal of all old coatings prior to repainting. However, all surface contamination such as oil, grease, loose paint, mill scale, dire, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers must be removed to assure sound bonding to the tightly adhering old paint. Glossy surfaces of old paint films must be clean and dull before repainting. Thorough washing with an abrasive cleanser will clean and dull in one preparation or wash thoroughly and dull surface by sanding. After preparation, coat entire surface with primer (including well adhered previous coatings). Check for compatibility by applying a test patch of the recommended coating system, covering at least 2 to 3 squares feet. Allow to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, complete removal is required. Provide test results for Architect's review showing compliance prior to ordering materials.

3.2 Time Between Surface Preparation and Painting

   A. Surfaces that have been cleaned, pre-treated and/or otherwise prepared for painting shall be given a coat of the specified first-coat material as soon as practicable after such preparation has been completed, but in any event prior to any deterioration of the prepared surface.

3.3 Mixing

   A. Quality: At time of application, paint shall show no signs of hard settling, excessive skinning, livering or other deterioration.

   B. Consistency: Paint shall be thoroughly stirred, strained and kept at a uniform consistency during application.

   C. Prohibited Mixing: Paint of different manufacturers shall not be mixed together.

   D. Thinning: Where necessary to suit conditions of surface, temperature, weather and method of application, packaged paint may be thinned immediately prior to application in accordance with the manufacturer's directions, but not in excess of one (1) pint of suitable thinner per gallon. The use of thinner for any reason shall not relieve the Contractor from obtaining complete hiding coverage.
E. Colorant: Primer may be tinted with a colorant recommended by the manufacturer.

3.4 Application

A. Method of Application: Paint shall be applied in accordance with manufacturer's recommendations. On masonry surfaces, filler coat and other first coats shall be applied by brush. Subsequent coats shall be applied by brush (or roller, on smooth faced units). On all other surfaces, prime and finish coats may be applied by brush or roller.

B. Sequence of Coats: Sufficient time shall elapse between successive coats to permit proper drying. This period shall be modified as necessary to suit adverse weather conditions.

C. General Requirements for Workmanship:
   1. Coverage and hide shall be complete. When color, stain, dirt or undercoats show through final coat of paint, the surface shall be covered by additional coats until the paint film is of uniform finish, color, appearance, thickness and coverage, at no additional cost to the Owner.
   2. Rate of application shall not exceed average rate of coverage recommended by manufacturer for the type of surface involved less ten percent (10%) allowance for losses, unless manufacturer's printed recommended specifications state that the recommended rate included normal expected losses.
   3. Minimum dry film thickness per coat shall not be less than thickness recommended by the manufacturer.
   4. The finished surfaces shall be free from runs, drops, ridges, waves, laps, brush marks and free of variations in color, texture and finish.
   5. All interior wood trim shall be back-primed before installation with enamel undercoat or penetrating sealer, as required.
   6. Sand enamel or varnish finish applied to wood or metal with fine sandpaper and then clean between coats to produce an even, smooth finish.
   7. Remove electrical panel box covers and doors before painting wall. Paint separately and reinstall after all paint is dry.

3.5 Touch-Up Work

A. A minimal amount of touch-up work to newly painted surfaces will be allowed (one touch-up per every 10 square feet of wall area), but only if the repair is not visible upon close inspection. Contractor must refinish a whole wall rather than spot-finish where there are numerous repairs to be made, or where remedial work is unsatisfactory.

3.6 Painting Schedule - Explanation:

A. Except as specified under the "Surfaces Not to be Painted" paragraph, the surfaces listed in the painting schedule shall receive the surface treatment, paints and number of coats indicated. Piping and ductwork shall not be painted until the piping and ductwork have been tested and approved.

3.7 Painting Schedule

A. Steel and Ferrous Metals (Including Piping):
   1. First Coat: Fabricator's shop coat or Pro-Industrial Pro-Cryl Universal Primer (B66-310) at 2.0 - 4.0 mils dry per coat.
   2. Second and Third Coats: Solo 100% Acrylic Interior/ Exterior (Sheen to match existing), at 1.8 mils dry per coat.

B. Galvanized Metal (Sheet Metal, Decking, Piping, Conduit, Etc.):
   1. First Coat: Pro-Industrial Pro-Cryl Universal Primer (B66-310) at 2.0 - 4.0 mils dry per coat.
   2. Second and Third Coats: Solo 100% Acrylic Interior/ Exterior (Sheen to match existing), at 1.8 mils dry per coat.

C. Gypsum Board:
Painting and Coating

1. First Coat: Sherwin Williams PVA Interior Latex Primer & Sealer (B28W08000) at 1.1 mils dry per coat.
2. Second and Third Coats: Sherwin Williams ProMar 200 Zero VOC with eggshell sheen, at 1.4 mils dry per coat.

D. Interior Wood (Painted):
   1. First Coat: Premium Wall & Wood Interior Latex Primer (B28W8111) at 1.8 mils dry per coat.
   2. Second and Third Coats: ProMar 200 Interior Alkyd Enamel (Sheen to match existing), at 1.8 mils dry per coat.

E. Interior Wood (Clear Finish):
   1. First Coat: Wood Classics FastDry Sanding Sealer (B26V43) at 1.0 - 1.2 mils dry per coat.
   2. Second and Third Coats: Wood Classics FastDry Oil Varnish - Satin (A66-300 Series), Satin Sheen at 1.3 mils dry per coat.

F. Interior Wood (Stained with Clear Finish):
   1. First Coat: Wood Classics Interior Oil Stain (A49-200 Series) at 3.0 – 3.5 mils wet per coat.
   2. Second Coat: Wood Classics FastDry Sanding Sealer (B26V43) at 1.0 - 1.2 mils dry per coat.
   3. Third and Fourth Coats: Wood Classics FastDry Oil Varnish - Satin (A66-300 Series) at 1.3 mils dry per coat.

G. Exterior Site & Traffic Marking:
   1. First and Second Coats: PRO-PARK Waterborne Traffic Marking Paint waterborne acrylic alkyd striping paint at 30 mils per wet coat.

3.8 Cleaning

A. Cloths and cotton waste that might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each day. Upon completion of the work, all staging, scaffolding and containers shall be removed from the site or destroyed in an approved manner. Paint spots, oil or stains upon adjacent surfaces shall be removed and the entire job left clean and acceptable.
10 14 15 Interior Signage

Part 1 – General

1.1 Section Includes

A. Plastic interior panel signs.
   1. Room Identification.
   2. Stairs.
   3. Restroom.
   4. Elevator Lobby.
   5. Informational Signage.

1.2 Related Sections

A. Room Names and Numbers as indicated on Drawings.
B. Section 09 21 16 Gypsum Wallboard Systems.

1.3 References

A. ANSI 117.1 - For Buildings and Facilities.
B. ASTM International (ASTM):
   1. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
C. Underwriters Laboratories (UL):
   1. UL 94 - Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.

1.4 Submittals

A. Submit under provisions of Section 01 33 00 Submittal Procedures.
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: Detail drawings showing sizes, lettering and graphics, construction details of each type of sign and mounting details with appropriate fasteners for specific project substrates.
D. Manufacturer’s Installation Instructions: Printed installation instructions for each signage system.
E. Message List: Signage report indicating signage location, text, and sign type.
F. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer’s full range of available colors and available pictograms, characters, and Braille indications.
G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and typical pictograms, characters, and Braille indications.

1.5 Quality Assurance

A. Manufacturer Qualifications: Minimum two years documented experience in the work of this Section.
B. Installer Qualifications: Minimum two years documented experience in the work of this Section.
C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Furnish signs designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by the Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.6 Delivery, Storage, And Handling

A. Deliver materials in unopened factory packaging.
B. Inspect materials at delivery to verify there are no defects or damage.
C. Store products in manufacturer's original packaging until ready for installation in climate-controlled location away from direct sunlight.
D. Store and dispose of solvent-based materials, and materials used with solvent-based materials in accordance with requirements of local authorities having jurisdiction.

1.7 Project Conditions

A. Install products in an interior climate-controlled environment.
B. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside the manufacturer’s absolute limits.

Part 2 – Products

2.1 Manufacturers

A. Acceptable Manufacturer: Nova Polymers, Inc., which is located at: 8 Evans St. Suite 201; Fairfield, NJ 07004; Toll Free Tel: 888-484-NOVA (6682); Email: info@novapolymers.com; www.novapolymers.com
   1. Acceptable Fabricator: Per Manufacturer’s Preferred Fabricator list.
B. Prior approved equal.

2.2 Performance Requirements

A. Provide photopolymer signage that conforms to the requirements of all regulatory agencies holding jurisdiction.
B. Requirements:
   1. Comply with all applicable provisions of the 2010 ADA Standard for Accessible Design.
   2. Character Proportion: Letters and numbers on signs must have a width-to-height ratio between 3:5 and 1:1 and a stroke width-to-height ratio between 1:5 and 1:10.
   3. Color Contrast: Characters and symbols must contrast with their background - either light characters on a dark background or dark characters on a light background.
   4. Raised Characters or Symbols: Letters and numbers on signs must be raised 1/32 in (0.8 mm) minimum and be sans serif characters. Raised characters or symbols must be at least 5/8 in (16 mm) high but no higher than 2 in (50 mm). Symbols or pictograms on signs must be raised 1/32 in (0.8 mm) minimum.
   5. Symbols of Accessibility: Accessible facilities required to be identified must use the international symbol of accessibility.
6. Braille: Grade II with accompanying text.

C. Fire Performance Characteristics:
1. Provide photopolymer signage with surface burning characteristics that consist of a flame spread of 75 and a smoke development of 120 when tested in accordance with UL 723 (ASTM E 84).
2. Self-Extinguishing: Provide photopolymer signage with a CC1 classification for .060 in thick material when tested in accordance with the procedures in ASTM D 635, Standard Test Method for Rate of Burning and/or Extent and Time of Burning Plastics in a Horizontal Position.
3. Vertical Burn: Provide photopolymer material that is classified as 94V-2 for material .118 in thick or greater and 94HB for material .118 in thick or less when tested in accordance with UL 94, Tests for Flammability of Plastic Materials for Parts in Devices and Appliances.
4. Self-Ignition Temperature: Provide photopolymer material that has a self-ignition temperature of 800 degrees F (427 degrees C) when tested in accordance with ASTM D 1929.

D. Novacryl PETG: Polyethylene terephthalate glycol. A thermoplastic polyester with high chemical resistance, and formability.
1. ADA Compliant.
2. NSF: Listed.
3. FDA: Conforms to food contact regulations.
4. Physical Properties:
   a. Specific Gravity per ASTM D792: 1.27.
   b. Optical Refractive Index per ASTM D542: 1.57.
   c. Light Trans - Total per ASTM D1003: 86 percent.
   d. Light Trans - Haze per ASTM D1003: 1 percent.
   e. Water Absorption by weight per ASTM D570: 0.2 percent.
5. Mechanical Properties:
   a. Tensile Strength per ASTM D638: 7,700 psi.
   b. Tensile Modulus of Elasticity per ASTM D790: 320,300 psi.
   c. Flexural Strength per ASTM D790: 11,200 psi.
   d. Flexural Modulus of Elasticity per ASTM D790: 10,000 psi.
   e. Izod Impact Strength Molded - Milled Notch per ASTM D256: 1.7 Ft-lb per inch Notch.
   f. Rockwell Hardness per ASTM D785: R-115.
   g. Drop Dart Impact per ASTM D3763: 22 ft-lbs.
   h. Shear Strength per ASTM D732: 9,000 psi.
   i. Compressive Strength per ASTM D695: 8,000 psi.
6. Thermal Properties:
   a. Deflection Temperature at 264 psi ASTM D648: 157 degrees F.
   b. Deflection Temperature at 66 psi ASTM D648: 164 degrees F.
   c. Coefficient of Thermal Expansion ASTM D696: 3.8x10 Inches per inch per degrees F.
   d. Flammability (Burning Rate) ASTM D635: 0.06 Inches per minute.
   e. Flammability UL 94: HB.
   f. Smoke Density Rating ASTM D2843: 53.8 percent.
   g. Self-Ignition Temp ASTM D1929: 880 degrees F.
   h. Flame Spread Index ASTM E84: 85.
   i. Smoke Development Index ASTM D84: 450.
   j. Glass Transition Temperature ASTM D3418: 178 degrees F.
7. Electrical Properties:
   a. Dielectric Constant at 1KHz ASTM D150: 2.6.
   b. Dielectric Constant at 1MHz ASTM D150: 2.4.
   c. Dielectric Strength ASTM D149: 410 Volts per mil.
2.3 Signage - General

A. It is the intent of these specifications to establish a sign standard for the Owner including but not limited to, wall-mounted directional signs, primary room identification, restrooms, conference rooms, exiting, and all code-compliant Braille signage.

B. Comply with all applicable provisions of the 2010 ADA Standard for Accessible Design codes that apply to the State and Local jurisdiction of the project.

C. If required text and graphics are not indicated in specification or on drawings, obtain Owner's instructions as to text and graphics prior to preparation of shop drawings.

D. Typography: Copy shall be a clean and accurate reproduction of typeface(s) specified. Upper and lower case and all caps to be determined in Submittals. Letter spacing to be set by manufacturer.

E. Arrows, symbols, and pictograms will be provided in style, sizes, colors and spacing as compliant with ADA guidelines.

F. Braille:
   1. Grade 2 Braille.

G. Design:
   2. Font: Optima.

2.4 Interior Signage

A. Panel Material: Novacryl PT Series Photopolymer
   1. Composition: 0.032 inch (0.8 mm) thick moisture resistant, non-glare interior nylon photopolymer on ultraviolet resistant clear NOVACRYL PETG sign base, single piece construction. Laminated photopolymers, added-on characters, and engraved characters are not acceptable.
   2. Sustainable Certification: Minimum 40 percent pre-consumer recycled content.
   3. Base thickness: 0.118 inch (3.0 mm) Non-glare NOVACRYL PETG.
   4. Type and Color: To be selected from manufacturer's full color range by Architect.
   5. Size: As required to display room names and numbers in ADA-Compliant font size and spacing.
   6. Surface burning characteristics: Flame spread/smoke developed rating less than 75/120, tested to ASTM E 84 and UL 723.
   7. Rate of burning: Tested to ASTM D 635 at nominal 0.060 inch (1.5 mm) thickness with resulting Classification CC1.
   8. Vertical burning: Tested to UL 94, classified as 94V-2 in thickness of 0.118 inch (3.0 mm) or greater and 94HB in thicknesses less than 0.118 inch (3.0 mm).

2.5 Accessories

A. Adhesive:
   1. Type recommended by sign manufacturer.
   2. Maximum volatile organic compound (VOC) content: 70 grams per liter.

B. Tape: Double sided, waterproof, pressure sensitive.

2.7 Fabrication

A. Fabricate panel material in accordance with manufacturer's instructions and approved shop drawings.

B. Fabricate signs by photo polymer process using film negatives to produce characters and graphics in contrasting color, raised. Refer to Signage Schedule.

C. Characters:
   1. Height: ADA-compliant size to be determined in Submittals.
   2. Style: To be selected by Architect from the manufacturer’s options.
3. Width to height ratio: ADA-compliant ratio to be determined in Submittals.
4. Stroke width to height ratio: ADA-compliant ratio to be determined in Submittals.
C. Pictograms: To be determined in Submittals.
D. Provide Braille Grade indications for each character.
E. Changeable Slide Inserts: Clear NOVACRYL PETG sheet cover with slot behind for insertion of changeable slide strip, removed from side.

**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.

3.4 Protection
A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

**End of Section**
Part 1 – General

1.1 Section Includes

A. Solid plastic toilet compartments including the following: (Eclipse)
   1. Floor mounted overhead-braced toilet compartments.
   2. Floor mounted urinal screens.

1.2 Related Sections

A. Section 06 10 00 Rough Carpentry.
B. Section 09 21 16 Gypsum Wallboard Assemblies.
C. Section 09 30 00 Tiling.

1.3 References

A. ASTM International (ASTM):

1.4 Submittals

A. Submit under provisions of Section 01 33 00 Submittal Procedures.
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 layout drawings and installation details with location and type of hardware required.
D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
E. Verification Samples: For each finish product specified, two samples representing actual product, color, and patterns.

1.5 Quality Assurance

A. Manufacturer Qualifications: A company regularly engaged in manufacture of products specified in this section, and whose products have been in satisfactory use under similar service conditions for not less than 5 years.
B. Installer Qualifications: A company regularly engaged in installation of products specified in this Section, with a minimum of 5 years experience.
C. Performance Requirements:
   1. Fire Resistance: Partition materials shall comply with the following requirements, when tested in accordance with the ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials:
      a. Class B flame spread/smoke developed rating, tested to ASTM E84.
   2. Material Fire Ratings:
1.6 Delivery, Storage, And Handling

A. Store products in manufacturer’s unopened packaging until ready for installation.

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 absolute limits.

1.8 Warranty

A. Manufacturer guarantees its plastic against breakage, corrosion, and delamination under normal conditions for 25 years from the date of receipt by the customer. If materials are found to be defective during that period for reasons listed above, the materials will be replaced free of charge. (Labor not included in warranty.)

Part 2 – Products

2.1 Manufacturers

A. Acceptable Manufacturer: Scranton Products, which is located at: 801 E. Corey St.; Scranton, PA 18505; Toll Free Tel: 800-445-5148; Fax: 855-376-6161; Email: info@scrantonproducts.com; www.scrantonproducts.com

B. Prior approved equal.

2.2 Material

A. Plastic Panels: High density polyethylene (HDPE) suitable for exposed applications, waterproof, non-absorbent, and graffiti-resistant textured surface;
   2. Fire-resistance Rating: Tested to meet ASTM E84, Class B.
   3. Standard Collection, Does not meet NFPA 286 or ASTM E84

B. Aluminum Extrusions: ASTM B221, 6463-T5 alloy and temper.
C. Aluminum Die Castings: ASTM B85, A380 alloy.
D. Stainless Steel Castings: ASTM A167, Type 304.
E. Rubber: Abrasion resistant Styrene Butadiene Rubber, 65 to 80 Shore A durometer, black.

2.3 Solid Plastic Toilet Compartments and Screens

A. Basis of Design: Eclipse Toilet Partitions as manufactured by and supplied by Scranton Products.
   1. Style: Floor mounted overhead-braced toilet compartments.

B. Doors and Panels: High density polyethylene (HDPE), fabricated from SEQ CHAPTER 1 extruded polymer resins, forming single thickness panel.
   1. Waterproof and non-absorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
   2. Thickness: 1 inch (25 mm).

C. Panel Color: Architect and Owner shall select from the full range of colors, patterns, and textures available in the Manufacturer’s series including:
   1. Traditional Series
   2. Bold Series
   3. Warm Series
   4. Metallic Series

D. Doors and Dividing Panels:
1. High Privacy:
   a. Height: 62 inches (1575 mm) high and mounted at 14 inches (356 mm) above the finished floor as shown on drawings.

E. Metal Posts: 82.75 inches (2102 mm) high, heavy duty extruded aluminum, clear anodized finish, fastened to foot with stainless steel tamper resistant screw.

F. Hidden Shoe (Foot): One-piece molded polyethylene invisible shoe inserted into metal post and secured to metal post with stainless steel tamper resistant screw.

G. Headrail Cap and Corner Cap: One-piece molded polyethylene secured to metal post with stainless steel tamper resistant screw; adjustable to level headrail to finished floor.

H. Wall Brackets: Continuous heavy duty extruded aluminum, clear anodized finish, inserted into slotted panel and fastened to panels with stainless steel tamper resistant screws.
   1. Type: Single Ear bracket aluminum.
   2. Type: Double ear bracket aluminum.
   3. Length: 61 inches (1550 mm).

I. Headrail: Heavy duty extruded aluminum, designer anti-grip design, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant screw and to headrail cap or corner cap with stainless steel tamper resistant screw.
   1. Headrail Brackets: Heavy duty extruded aluminum, clear anodized finish, secured to wall with stainless steel tamper screws.

J. Door Hardware:
   1. Hinges:
      a. Edge-mounted helix style stainless steel continuous hinge.
         1) Closing degree: 5 degrees.
         2) Comes to a full close on its own weight
   2. Occupancy Indicator Latch and Housing:
      b. Occupancy indicators: Green for occupied and red not occupied.
      c. Slide bolt and button.
   3. Coat Hook and Door Bumper Combination:
      a. Material: Chrome plated Zamak
      b. Handicap Door: Equip with second door pull and door stop.
   4. Door Pulls: Chrome plated Zamak

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.
C. Examine areas to receive toilet partitions, screens, and shower compartments for correct height and spacing of anchorage/blocking and plumbing fixtures that affect installation of partitions. Report discrepancies to the architect.

3.3 Installation

A. Install in accordance with manufacturer’s instructions and approved Shop Drawings.
B. Install partitions rigid, straight, plumb, and level.
C. Locate bottom edge of doors and panels 14 inches (356 mm) above finished floor.
D. Clearance at vertical edges of doors shall be uniform top to bottom and shall not exceed 3/8 inch (9.5 mm).
E. No evidence of cutting, drilling, and/or patching shall be visible on the finished work.
F. Finished surfaces shall be cleaned after installation and be left free of imperfections.

3.4 Adjusting
A. Adjust doors and latches to operate correctly.

3.5 Protection
A. Protect installed products until completion of project.
B. Touch-up, repair or replace damaged products before Substantial Completion.

End of Section
10 28 13 Commercial 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.
2. Childcare accessories.
3. Underlavatory guards.

B. Related Requirements:

1. Section 093 30 00 "Tiling" for ceramic toilet and bath accessories.

1.3 Coordination

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 Action Submittals

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Include electrical characteristics.

B. Samples: Full size, for each exposed product and for each finish specified.

1. Approved full-size Samples will be returned and may be used in the Work.

C. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

1.5 Informational Submittals

A. Sample Warranty: For manufacturer’s special warranty.
1.6 Closeout Submittals
   A. Maintenance Data: For accessories to include in maintenance manuals.

1.7 Warranty
   A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.
      1. Failures include, but are not limited to, visible silver spoilage defects.
      2. Warranty Period: 15 years from date of Substantial Completion.

Part 2 – Products

2.1 Performance Requirements
   A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 Public-Use Washroom Accessories
   A. Source Limitations: Obtain public-use washroom accessories from single source from single manufacturer.
   B. Combination Toilet Tissue Dispenser:
      1. Basis of design: Georgia Pacific #59209 Jumbo Jr. Two-Roll Bathroom Tissue Dispenser
      2. Description: Combination unit with double-roll toilet tissue dispenser.
      3. Mounting: Surface mounted
      4. Toilet Tissue Dispenser Capacity: 4-1/2- or 5-inch- (114- or 127-mm-) dia. tissue rolls.
      5. Toilet Tissue Dispenser Operation: Noncontrol delivery with theft-resistant spindles
      7. Lockset: Tumbler type.
   C. Recessed Paper Towel Dispenser / Waste Receptacle:
      2. Mounting: Recessed
      3. Minimum Capacity:
         a. Paper Towels: 600 C-Fold Paper Towels or 800 Multifold Paper Towels
         b. Waste Receptacle: Bobrick 367-60 Interchangeable Receptacle 12 gal. with Bobrick 3944-134 LinerMate
      4. Material and Finish: Stainless Steel, Type 304.
   D. Toilet Seat-Cover Dispenser:
      1. Basis of Design: Bobrick B-221 Toilet Seat-Cover Dispenser
      2. Mounting: Surface
      3. Minimum Capacity: 250 single toilet seat covers
      4. Material and Finish: Stainless Steel, Type 304.
   E. Sanitary Napkin Disposal:
      2. Mounting: Surface
      3. Material and Finish: Stainless Steel, Satin Finish
      4. Lockset: Tumbler type
F. Liquid-Soap Dispenser: Provide by Owner Vendor

G. Grab Bar:
   1. Manufacturers:
      a. Bobrick Washroom Equipment
      b. Bradley Corporation
      c. American Specialties, Inc.
      d. GAMCO Specialty Accessories.
   3. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
      a. Finish: Smooth, No. 4 finish (satin) on ends and slip-resistant texture in grip area.
   4. Outside Diameter: 1-1/4 inches (32 mm)
   5. Configuration and Length: As indicated on Drawings

H. Framed Mirror Unit:
   1. Manufacturers:
      a. Bobrick Washroom Equipment
      b. Bradley Corporation
      c. American Specialties, Inc.
      d. GAMCO Specialty Accessories
   2. Frame: Stainless-steel angle, 0.05 inch (1.3 mm) thick
      a. Corners: Manufacturer’s standard
      a. One-piece, galvanized-steel, wall-hanger device with spring-action locking mechanism to hold mirror unit in position with no exposed screws or bolts.
      b. Wall bracket of galvanized steel, equipped with concealed locking devices requiring a special tool to remove.
   4. Size: 24 inches wide by 36 inches high.

2.3 Childcare Accessories

A. Source Limitations: Obtain childcare accessories from single source from single manufacturer.

B. Diaper-Changing Station:
   1. Basis of Design: Koala Kare KB200 Horizontal Changing Station
   4. Material and Finish: HDPE in manufacturer’s standard color
   5. Liner Dispenser: Built in.

2.4 Underlavatory Guards

A. Underlavatory Guard:
   1. Manufacturers:
      a. Buckaroos, Inc.
      b. Plumberex Specialty Products
      c. Truebro by IPS Corporation
   2. Description: Insulating pipe covering for supply and drain piping assemblies that prevents direct contact with and burns from piping; allow service access without removing coverings.
2.5 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.


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.

2.6 Fabrication

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner’s representative.

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 instructions.

End of Section
Part 1 – General

1.1 Section Includes

A. Manual disappearing stairway.

1.2 Related Sections

A. Section 05 12 13 Architecturally Exposed Structural Steel Framing.
B. Section 06 10 00 Rough Carpentry.
C. Section 09 51 13 Acoustical Ceiling System.

1.3 References

A. ANSI A14.9: Safety Requirements for Ceiling Mounted Disappearing Climbing Systems.

1.4 Submittals

A. Submit under provisions of Section 01 33 00 Submittal Procedures.
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 for Ladders:
   1. Plan and section of stair installation.
   2. Indicate rough opening dimensions for ceiling and/or roof openings.
D. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square representing actual product, color, and patterns.

1.5 Quality Assurance

A. Manufacturer Qualifications: Minimum 5 year experience manufacturing similar products.
B. Installer Qualifications: Minimum 2 year experience installing similar products.

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. Store products in manufacturer's unopened packaging until ready for installation. Store stairway until installation inside under cover. If stored outside, under a tarp or suitable cover.
C. Handle materials to avoid damage.

1.7 Project Conditions

A. Maintain environmental conditions including temperature, humidity, and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.9 Sequencing

A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
1.10 Warranty
A. Limited Warranty: Provide manufacturer's standard limited five year warranty against defective material and workmanship, covering parts only, no labor or freight. Defective parts, if deemed so by the manufacturer, will be replaced at no charge, freight excluded, upon inspection at manufacturer's plant which warrants same.

Part 2 – Products
2.1 Manufacturers
A. Manufacturer: Precision Ladders, LLC, which is located at: P. O. Box 2279; Morristown, TN 37816-2279; Toll Free Tel: 800-225-7814; Tel: 423-586-2265; Email: info@PrecisionLadders.com; Web: www.PrecisionLadders.com
B. Prior approved equal.

2.1 Manual Disappearing Stairway
A. Manual Disappearing Stairway: Product: Super Simplex Disappearing Stairway as manufactured by Precision Ladders LLC
   1. Model 1: Stairs for Ceiling Heights 7 feet-0 inch - 12 feet-0 inch (2134 mm - 3658 mm).
   B. Performance Standard: Unit shall comply with ANSI A14.9, Commercial Type, for rough openings between 27 inches to 39 inches (686 mm to 991 mm).
   C. Components:
      1. Ceiling Opening:
         a. Ceiling height of 9 feet 9 inches (2972 mm) or less requires an opening of 30 inches X 54 inches (762 mm X 1372 mm).
         b. Ceiling heights from 9 feet 10 inches - 12 feet 0 inch (2997 mm - 3658 mm) require opening of 30 inches X 64 inches (762 mm X 1626 mm).
         c. Ceiling heights from 12 feet 1 inch - 13 feet 6 inches (3683 mm - 4115 mm) require opening of require opening of 22-1/2 inches X 72 inches (572 mm X 1829 mm).
      2. Stairway Stringer: 6005-T5 Extruded aluminum channel 5 inches X 1 inch X 1/8 inch (127 mm X 25 mm X 3 mm) tri-fold design; steel blade type hinges; adjustable feet with plastic Mar-guard. Pitch shall be 63 degree.
      3. Stairway Tread: 6005-T5 extruded aluminum channel 5-3/16 inches X 1-1/4 inches X 1/8 inch (132 mm X 32 mm X 3 mm). Depth is 5-3/16 inches (132 mm). Deeply serrated top surface. Riser Height: 9-1/2 inches (241 mm). Clear Tread Width for Standard Width: 18 inches (457 mm).
      4. Railing: Aluminum bar handrail riveted to stringers, upper section only.
      5. Frame:
         a. When ceiling to floor or roof deck above is under 12 inches (305 mm) frame shall be 1/8 inch (3 mm) steel formed channel, box.
         b. When ceiling to floor or roof deck above is 12 inches (305 mm) or greater, the frame shall be 1/8 inch (3 mm) steel, 63 degree (with built-in steps) on the hinge end, 90 degree on the other end, custom depth to fill distance from ceiling to floor above. The custom frame shall require a longer opening in the floor above than shall be required at the ceiling level.
      6. Door Panel:
         a. Standard, non-fire rated, door shall be constructed of 1/8 inch (3 mm) aluminum sheet attached to stairway frame with a steel piano hinge. Door overlaps bottom flange of frame. Eye bolt accommodates pole for opening and closing door.
7. Hardware:
   a. Steel blade type hinge connecting stringer sections. Zinc plated and chromate sealed.
   b. Steel operating arms, both sides. Zinc coat with clear trivalent chromate.
   c. Double acting steel springs and cable, both sides.
   d. Rivets rated at 1100 lb (499 Kg) shear strength each.
   e. Steel section alignment clips at stringer section joints.
   f. Molded rubber guards at corners of aluminum door panel.


D. Accessories:
   1. Steel pole to aid opening and closing stairways.
   2. Stairs shall be equipped with a patented Precision Fold Assist to aid in folding and unfolding of sections.

2.2 Fabrication

   A. Completely fabricate ladder ready for installation before shipment to the site.
   B. Completely fabricate handrail components ready for field assembly to ladder before shipment to site.

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.
   C. Examine materials upon arrival at site. Notify the carrier and manufacturer of any damage.

3.3 Installation

   A. Install in accordance with manufacturer’s instructions and approved submittals. Install in proper relationship with adjacent construction.

3.4 Protection

   A. Protect installed products until completion of project.
   B. Touch-up, repair or replace damaged products before Substantial Completion.

End of Section
SECTION 200000 - MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the Contract apply to the work specified in MECHANICAL DIVISION.

B. Separation of MECHANICAL DIVISION into Sections is for convenience only and is not intended to establish limits of work. Sections are as follows:

1. 200000 - MECHANICAL GENERAL PROVISIONS
2. 221000 - PLUMBING SYSTEMS
3. 230500 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS
4. 230900 - HEATING, VENTILATING AND AIR CONDITIONING CONTROL SYSTEMS

1.2 SCOPE

A. Provide labor, materials and equipment for complete and operating systems.

1.3 CUTTING AND PATCHING

A. Cutting and patching for the work of this Division shall be in accordance with the requirements of the General Conditions. Work of this Division shall include providing information for any required openings to those responsible for concrete slabs and other concrete members. Openings associated with work of this Division not indicated or specified in other Divisions, shall be work of this Division. Field cut openings shall be located to avoid the reinforcing. Locations of field cut openings in slabs and structural members shall not proceed without the written approval of the Architect/Engineer.

1.4 DRAWINGS

The drawings are diagrammatic and are intended to show the general arrangement and approximate physical sizes of equipment, piping and ductwork. Every nut, bolt, brace, hanger, piping or duct rise, drop, offset, etc., is not indicated or specified. Each item (required, necessary or incidental, for the proper and dependable operation of each system) shall be provided under this Division whether specifically referred to or not. Refer to architectural drawings for necessary dimensions and to shop drawings and submittals for physical size of equipment.
1.5 CODES AND PUBLICATIONS

A. Work shall be executed in accordance with the presently enforced Codes and Publications which shall include but shall not be limited to the following:

1. International Building Code
2. Louisiana State Plumbing Code
3. ASPE Data Book
4. ASHRAE Publications
5. Louisiana State Fire Marshal Act
6. SMACNA, Sheet Metal and Air Conditioning Contractors National Association
7. NFPA 70 - National Electrical Code
8. NFPA 90A - Installation of Air Conditioning & Ventilating Systems

B. Where the above are at variance with the Contract Documents, the more stringent requirements shall be applicable.

1.6 REVIEWS, PERMITS AND INSPECTIONS

A. Equipment installed outdoors shall be installed at or above the FEMA Base Flood Elevation (BFE). Obtain flood elevation from a licensed surveyor and pay the cost associated therewith. Provide documentation to the Architect/Engineer to confirm that this requirement will be met. Buildings that are built with the floor slab exceeding the FEMA BFE shall have outdoor equipment installed at elevations indicated on the Contract Documents, however, should these elevations be at variance with the FEMA BFE the equipment shall still be installed at or above the FEMA BFE.

B. Apply for and pay for governmental and regulatory agency reviews, permits and inspections. Provide plumbing riser diagrams, sketches, etc. as required by regulatory agencies for permit issuance. No work shall be concealed until approved by the governmental or regulatory agency inspectors and the Architect/Engineer. Local regulations shall be adhered to. Upon completion, a Certificate of Approval from the appropriate regulatory agencies shall be provided the Architect/Engineer.

1.7 FEES AND DEPOSITS

A. Arrange for and pay regulatory inspection and service connection fees (sewer, drainage, water, and gas). Pay meter deposits for utility services. After substantial completion of the project, the meter registration shall be transferred to the Owner.

1.8 VISITING SITE
A. The Bidder shall visit the site of proposed work so that he may understand the facilities, difficulties, and restrictions attending the execution of the Contract. No additional compensation will be allowed for failure to be so informed.

1.9 WORK IN OTHER DIVISIONS

A. Prior to bidding, the Contractor shall coordinate items of work referred to as "work of other Divisions" to insure items are not omitted or duplicated.

1. Utility connections - sewer, storm drainage, and water.

2. Electrical work (wiring, raceways and disconnect switches), fire alarm work (wiring, raceways, equipment and devices) associated with work of this division and not specified as work of Division 16 - Electrical, shall be work of this division.

3. Supports for work of this Division, except supports specifically indicated to be provided under other Divisions, shall be provided as work of this Division. Supports provided under other Divisions shall be checked and coordinated under this Division to ensure that they suit the work to be installed.

4. Damaged surfaces of factory finished items shall be repaired to the satisfaction of the Architect/Engineer as the work of this Division. Nameplates shall be protected until painting has been accomplished. Protection shall be removed and nameplates cleaned prior to acceptance of equipment.

5. Door grilles and access doors provided under this Division and not specified for installation as work of other Divisions, shall be installed as work of this Division.

1.10 MANUFACTURER'S RECOMMENDATIONS

A. Equipment and materials provided under this Division of the specifications shall be installed according to manufacturer's recommendations. Each manufacturers' application and installation instructions shall be reviewed prior to ordering equipment or commencing with the work. If the drawings or specifications show or describe any deviations from the manufacturer's recommendations the Contractor shall request clarification, from the Architect/Engineer and provide as directed at no additional cost to the Owner.

1.11 GUARANTEE AND SERVICE

A. The equipment, materials and workmanship shall be guaranteed for one year after beneficial use of a particular system, beneficial occupancy of the building or final acceptance of entire project. Where specifically indicated extended warranties shall be
provided. Beginning date of guarantee will be established only after written request is received by the Architect/Engineer from the Contractor, and agreed upon by the Architect/Engineer stating the date the systems were turned over to the Owner for beneficial use or occupancy.

B. During the one year period of guarantee, any defects in equipment, materials, or workmanship shall be promptly corrected without cost to the Owner. Mechanical and associated electrical equipment shall be serviced and adjusted without cost during the guarantee period. Servicing and adjusting shall include labor, material, parts, etc., required during the first year. It includes but is not limited to: oiling motors, adjusting belts, adding refrigerant, adjusting and calibrating controls, and repairing leaks.

1.12 INTERRUPTION OF SERVICES

A. Services in existing buildings are to be kept in operation during renovations, except when specific permission is given to do otherwise. Before any services are interrupted, arrangements shall be made with the Owner to do this work at a time most convenient to the Owner. This procedure may involve working at night, on Saturday or Sunday, or at a special time of the year, with the length of time of the interruption agreed upon in advance. Once any service is interrupted, work to restore the service shall be on a continuous basis unless temporary service is provided or approval is obtained from the Owner to do otherwise. Temporary services indicated or required shall be provided as work of this Division. Allowance shall be made in the bid for the cost of any overtime incurred. Provide valves, caps, plugs, flanges, piping, etc. as required so that the existing utility can be placed back into service with provisions for the utility to be extended without an additional shutdown. Provide additional drains and vents in new and existing piping systems to minimize required shutdowns. Draining and filling piping systems after shutdowns have been completed shall be work of this Division.

1.13 DEMOLITION

A. Demolition work shall conform to the applicable requirements of DIVISION 1 - GENERAL REQUIREMENTS. Routings indicated for existing mechanical systems are approximate. Field verify existing conditions prior to ordering equipment or materials and make field adjustments as required.

B. Existing plumbing fixtures, equipment, piping and/or ductwork not being reused shall be disconnected and removed. Services serving the equipment being removed shall be removed back to the next piece of equipment which remains, or to the existing main or duct which remains, and shall be capped or plugged, unless otherwise noted on the drawings. Refer to architectural and mechanical drawings and specifications for more detailed requirements.
C. Care shall be taken in the removal of plumbing fixtures, equipment, piping and/or ductwork which the Owner elects to retain. In the removal of existing plumbing fixtures, equipment, ductwork and/or piping, that portion of any system which remains shall continue to function as before.

1.14 EXISTING WORK

A. Exercise care in the installation of new work so as not to render any of the existing systems that are to remain inoperable. Should the installation of new plumbing fixtures, equipment, piping and/or ductwork require the temporary removal and reinstallation or modification and relocation of existing fixtures, equipment, piping and/or ductwork, the cost shall be included as work of this Division and no additional compensation will be allowed.

B. Where existing piping or duct systems are indicated to be re-used, it is not possible to guarantee that the existing systems are completely suitable to be re-used. Before the systems are placed into service, a thorough check shall be made of existing equipment, piping systems, ductwork, etc., that will not allow new or existing equipment, piping, or duct systems to operate properly and shall notify the Architect/Engineer of any deficiencies found. Submit a description of the proposed remedial work to correct any deficiencies along with a detailed cost estimate.

C. Provide piping adaptors (increaser/reducer) or duct transitions at point of each connection. Verify field conditions, dimensions and sizes of piping and ducts, etc., required for work of this Division to connect with existing work now in place. Any discrepancies between the Contract Documents and the existing conditions shall be referred to the Architect/Engineer prior to ordering materials or performing any work affected by these discrepancies.

D. When connecting to existing systems, field verify positions of supply and return piping before performing any work. The directional flow arrows and piping labels indicated on the drawings shall be confirmed before performing any work. Report any discrepancies to the Architect/Engineer before proceeding. When connection to any existing system field verify the service of the existing system before performing any work. When connecting to existing drainage (sewer, storm drain, etc.) systems, field verify location, depth, size, slope, and direction of flow prior to performing any work.

1.15 EXISTING EQUIPMENT AND MATERIALS

A. Mechanical equipment removed and not indicated to be re-used shall be stored in one location on the site. Any equipment or material which the Owner does not designate to be retained shall become the property of the Contractor and shall be removed from the site by him.
1.16 SPECIAL CONDITIONS

A. No piping, ducts or other mechanical equipment foreign to electrical equipment shall pass through or above spaces dedicated to electrical panelboards, electrical distribution panels, electrical switchboards, and motor control centers. Work shall conform with NFPA 70. Working clearances and dedicated spaces at electrical equipment shall be maintained per NFPA 70. Coordinate with each trade.

PART 2 - PRODUCTS

2.1 MATERIALS AND WORKMANSHIP

A. Equipment and materials shall be new and shall be listed by Underwriters' Laboratories, Inc. (UL) or Factory Mutual (FM) in categories for which standards have been set by that agency. Methods of installation shall be in full accord with the latest and current engineering practices. Pressure vessels, as called for by respective codes, shall be ASME and National Board Commission stamped.

2.2 SUBSTITUTIONS

A. Names of manufacturers and catalog numbers indicated in the Contract Documents are to establish a standard as to design and quality. Other products similar in design and of equal quality may be used if submitted to the Architect/Engineer and found acceptable. Refer to General Conditions for additional information. When the Contractor elects to use an acceptable alternate manufacturers' equipment, the Contractor shall be responsible to coordinate the change with the trades affected. The Contractor shall also pay for any additional work required under this Division as well as any other Division if the alternate equipment is used. If required by Architect/Engineer because of substitutions, submit for review ¼" scale working drawings of equipment areas with plan and section views.

2.3 SUBMITTALS

A. Within 30 days after award of the Contract, and before executing any work, submit for review six copies of descriptive equipment literature or shop drawings in one complete indexed and bound submittal for the following items:

- Access Doors
- Magnetic Starters
- Plumbing Valves and Cocks
- Cleanouts and Covers
- Insulation
- Plumbing Fixtures & Trim
- Drains
- Water Heaters
- Tempering Valves
- HVAC Valves
- Refrigerant Specialties
- Flexible Duct and Fittings
Vibration Isolators  
Condensing Units  
Air Handling Units  
Filters  
Split System Equipment  
Fans and Accessories  

Dampers  
Air Distribution Devices  
Water Treatment  
HVAC Control System Drawings  
HVAC Control System Components  
Testing and Balancing Contractor  

B. The same equipment manufacturer shall be provided for multiple items of similar equipment, regardless of capacities, on this project, unless prior written deviation is given by the Architect/Engineer. Submittals shall be identified with project name, equipment name and number as indicated on the drawings, and specification paragraph reference. Submittals shall be properly marked to show proposed model number and accessories being provided and shall have the Contractor's stamp certifying that he has reviewed the submittal and found it to be in accordance with the specifications and drawings. Where applicable, submissions shall include installation drawings and brochures showing locations, methods of anchoring, connections to work of others, wall conditions at each particular installation and special floor mounting conditions. Submittals which do not comply with the above will be returned without review, for resubmittal.

2.4 ACCESS DOORS

A. Doors in gypsum board or masonry construction shall be Karp type DSC-214M or Milcor style M-Standard, 16-gauge steel frame and 14-gauge steel door construction, continuous piano hinge and a zinc chromate prime coat. Doors in glazed or ceramic tile construction shall be same type as above except stainless steel construction. Doors in inaccessible acoustical tile ceilings, or walls with wall covering shall have 16-gauge steel frame and 18-gauge steel panel construction, recessed door for acoustical tile or gypsum board insert covered with matching wall covering, concealed hinge with a zinc chromate prime coat, and exposed edges painted white when installed in acoustical tile ceiling. Doors in fire rated partitions or ceilings (up to 1½ hour rating) shall carry the Underwriters' Laboratories "B" label. Doors required in types of construction not hereinbefore specified shall suit the type and style of material in which installed. Unless otherwise indicated doors shall have screw driver operated locks.

2.5 ENClosures

A. Control equipment enclosures provided by the Contractor or provided as part of a packaged piece of equipment shall meet the following minimum standards unless specifically indicated otherwise. Where indicated on the drawings or in the specifications, flush mounted enclosures shall be provided.

B. Control equipment enclosures provided within the building shall be equivalent to or greater than NEMA 1 type construction. Control equipment enclosures provided
outside of the building, a non-enclosed area of the building or in an accessible crawl space under a building shall be equivalent to or greater than NEMA 3R type construction with drain and breather. Control equipment enclosures provided within hazardous areas, controlling explosion-proof equipment shall be NEMA 7 or 9 type construction. Control equipment enclosures provided for cooling towers and associated equipment within 20'-0" of towers shall be NEMA 4X noncorrosive type construction.

2.6 FUSES

A. Provide fuses for all fused equipment provided under this Division. Fuses shall be size and type required by the equipment manufacturer.

2.7 MAGNETIC STARTERS

A. Provide combination type magnetic starters for three phase motors. Provide magnetic starters or contactors for single phase motors which start and stop as part of an automatic control sequence. Unless noted otherwise magnetic starters shall be across-the-line type rated per NEMA standards. Starters shall have under voltage protection when used with momentary-contact push button stations and shall have undervoltage release when used with maintained contact push button stations. Enclosures for starters shall be as hereinbefore specified. Starters in motor control centers shall be fully compatible with the motor control center. Provide two-speed starters for two-speed motors. Two-speed starters shall have timing relay for time delay between speed changes.

B. Starters shall be non-reversing type complete with integrally fused 120 volt control transformer, start-stop push button and pilot light or hand-off-auto switch and pilot light, where indicated, or as required for control. Two speed starters shall have hand-off-high-low selector switches and pilot lights. Starters for motors interlocked to run with other motors or which have automatic start-stop controls (exclusive of safety controls such as firestats, freezestats, etc.) shall have hand-off-auto switch. Starter shall be wired so as not to by-pass safety controls when in the "hand" position.

C. Starter contacts shall be of silver alloy, and shall be of the double break type. The movable magnet and contact assembly, an arc hood in which the fixed contacts are mounted, solenoid cell, and thermal overload relays (one in each phase) shall be assembled and mounted on a heavy steel back plate. The only moving part shall be the magnet and contact assembly which shall move up and down. Each pole shall be enclosed in an individual arc chamber.

D. Starters for 5 horsepower and larger 3-phase motors shall include under voltage/phase-reversal/phase-loss protection relay wired into the control circuit. Overload protective devices shall be selected in accordance with the motor nameplate, and shall be of the thermal inverse time limit type and shall include a manual reset type push button on the outside of the cover. Overloads shall operate on the melting alloy principle. Starters
shall have normally open and/or closed external electrical interlocks as required to suit equipment controlled. Magnetic starters shall include a disconnect switch with visible blades and Class R fuse rejection features. Acceptable manufacturers: Furnas Class 14, Square D Class 8536, GE Series 300 or approved equal.

2.8 MAGNETIC CONTACTORS

A. Magnetic contactors shall be Square D Series 8903-SMG70-V02 or equal, 30A, 3 pole, mechanically held, with 120 volt coil and non-fused disconnect.

2.9 MOTORS

A. Unless otherwise indicated, motors shall be NEMA Design B, constant speed, variable torque construction. Motors shall conform to the Energy Policy Act of 1992 and shall be of the premium efficiency type suitable for use with variable speed (variable frequency or voltage) motor drives. Electrical characteristics shall conform with the electrical supply as indicated on the electrical drawings.

B. Single-phase motors shall be split-phase or capacitor start type with built-in thermal overload. Three-phase motors shall be squirrel cage type.

C. Motors shall be guaranteed to operate continuously at full load with a 10% voltage variation above or below the specified voltage. Motors shall be rated for an ambient temperature of 40 degrees C and a temperature rise not to exceed 40 degrees C with a 1.15 service factor. Motors shall have either sleeve or pre-lubricated ball bearings as required for the particular application.

D. Motors shall be copper wound. Open drip-proof (ODP) motors shall have Class B insulation. Totally enclosed (TE) or totally enclosed fan cooled (TEFC) motors shall have Class F insulation. Motors shall be T-frame conforming to NEMA MG13 and tested in accordance with NEMA MG1 Part 12 and IEEE Test Procedure 112, Method B. Nameplate information shall include the manufacturer's nominal and guaranteed efficiency values.

E. Unless noted otherwise on the drawings or in the specifications, housings for motors in indoor locations shall be open drip proof (ODP) or explosion proof (XP) type. Motors in outdoor locations or subject to excessive moisture shall be totally enclosed (TE) or totally enclosed fan cooled (TEFC) type. Belt drive motors shall have bases with provisions for adjustment in field.

F. Motors provided on equipment not as an integral part of the equipment but propelling the equipment by the use of belts, sheaves, couplings, etc., shall be as manufactured by Emerson, General Electric, Marathon, U.S. Electric, or approved equal. Alternate manufacturers requesting approval shall submit evidence of a factory authorized
service facility within a reasonable distance of the project to service or replace motors under warranty. Motors manufactured by or specifically for equipment manufacturers and provided as an integral part of the equipment package need not comply with the requirements of this paragraph.

2.10 SAFETY PANS

A. Safety pans shall be fabricated from 18-gauge (min.) galvanized sheet steel. Sides of pans shall be a minimum of 2" high with top edges hemmed. Sides longer than 6'-0" shall have additional flat bar or angle top edge bracing to prevent sagging. Joints and seams shall be watertight. Pans shall be extend at least 6" beyond the sides of the equipment it is serving. Provide a 1" steel female pipe coupling in side of pan near the bottom for overflow piping connection.

2.11 PREPARED OPENINGS

A. Piping and tubing installed through masonry or concrete walls, floor/ceiling assemblies, and floors above grade shall be installed through pipe sleeves.

B. Ducts installed through masonry or concrete walls and non-rated concrete floors above grade shall pass through 20-gauge galvanized sheet metal sleeves. Duct sleeve shall have a 1/2" maximum annular clearance around duct. Allowance shall be made for external duct wrap (if specified). Ducts, tubing and piping installed through floors of mechanical rooms shall have a 4" high concrete curb on each side to prevent water from leaking through openings. Exposed piping installed through walls shall be fitted with chromium plated escutcheons on each side of the wall. Exposed ductwork passing through non-rated masonry or concrete walls shall be fitted with a 2" wide sheet metal flange around each side of duct on each side of the wall.

C. Ducts installed through partitions, walls or floors which are smoke rated or have a fire rating of one hour or greater shall be installed in accordance with SMACNA standards. Piping and tubing installed through partitions, walls, or floors which are smoke rated or have a fire rating of one hour or greater shall be installed through pipe sleeves.

2.12 ROOF MOUNTED EQUIPMENT, DUCTS AND PIPING

A. Roof mounted equipment shall be installed on equipment supports or curbs as detailed on the drawings or as specified. Tops of curbs shall be level. Ducts penetrating the roof shall be installed within a waterproof curbed area as detailed on the drawings. Piping penetrating the roof shall be installed through a pitch pocket or piping curb as noted or detailed on the drawings. Any penetrations of the roof shall be watertight.

2.13 PIPE SLEEVES
A. Sleeves for tubing and piping installed through masonry or concrete walls shall be Schedule 40, galvanized steel pipe. Sleeves for tubing and piping installed through fire or smoke rated dry wall partitions, floors, and floor/ceiling assemblies above grade shall be a minimum of Schedule 10, galvanized steel pipe. Sleeves for tubing and piping installed through basement walls, and floors, and slabs below water level shall have a water stop flange welded to sleeve.

2.14 FIRE BARRIER MATERIAL

A. Fire barrier material shall be provided in annular spaces between sleeves and piping or tubing where piping or tubing penetrates floors or partitions that have a fire rating of one hour or greater. Material shall be UL classified as a through penetration fill, void or cavity material and shall be capable of passing a 4 hour fire test per ASTM E 814. Material shall be installed in strict accordance with the manufacturers instructions. Acceptable manufacturers: 3M Fire Barrier, Metacaulk, Nelson Fire Stop, PTI Fire Seal, Thomas & Betts Fire Safe, or approved equal.

2.15 SAFING MATERIAL

A. Safing material shall be installed in annular spaces between sleeve and pipe or tubing where sleeve and pipe or tubing penetrate partitions that are designated as smoke separations. Material shall be mineral wool designed for hand packing. Material shall have an ASTM E 84 rating of flame spread –10, fuel contributed –0, smoke developed –0 and shall be rated non-combustible per ASTM E 136. Acceptable manufacturers: Carborundum, U.S. Gypsum, or approved equal.

2.16 CURBS AND SUPPORTS

A. Prefabricated metal curbs and equipment support rails for equipment provided on built-up roofs, unless otherwise noted on the drawings, shall be provided under SECTION 15600 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS. Curbs and equipment supports for equipment installed on metal roofs shall be a product of the metal roof manufacturer. [Poured in place concrete curbs and supports shall be in accordance with DIVISION 3 - CONCRETE.] Interior and exterior supports such as, but not limited to pipe stands, elbow supports, strut channels, trapeze supports, structural steel supports and hanger rods shall be hot-dipped galvanized after fabrication.

2.17 SUPPORTS

A. Supports shall adequately support the weight of the pipe and material contained within. Supports shall be manufactured in accordance with MSS SP-58, ANSI B31.1 and UL 203. Acceptable manufacturers: Elcen Mfg. Co., Michigan Hanger Co., Anvil, Persing & Co., or approved equal. Supports for piping above grade shall be as follows:
B.  Cast iron or steel piping:

1.  Interior:
   a.  Anvil Figure 260 adjustable clevis hanger and rod, carbon steel construction, zinc plated finish.
   b.  Strut channels, supporting steel, and trapeze hangers, carbon steel with zinc plated finish.

2.  Exterior (Crawl spaces and unenclosed areas):
   a.  Anvil Figure 260 adjustable clevis hanger and rod, carbon steel construction, hot dipped galvanized finish.
   b.  Strut channels, supporting steel, and trapeze hangers, carbon steel with hot dipped galvanized finish.

3.  Copper tubing - Anvil Figure CT-69 adjustable tubing ring and rod, carbon steel ring with copper finish and malleable iron adjusting nut.

4.  Riser clamps:
   a.  Clamps, bolts and nuts for cast iron or steel piping shall be Anvil Figure 261, carbon steel construction, hot dipped galvanized finish.
   b.  Clamps for copper tubing, glass or plastic piping shall be Anvil Figure 261c, black carbon steel construction, copper plated for copper tubing or with formed section plastic coated for glass or plastic piping.

C.  Hangers for piping under concrete slabs on grade or fill - Waste and vent, and domestic water piping shall be type 316 stainless steel rod.  Hangers for any other piping shall be type 316 stainless steel clevis type hanger and rod with rod lapped over the slab reinforcing steel.  See drawings for details.

2.18  UNIONS AND FLANGES

A.  Unions:

1.  Steel piping 2½” and smaller - Unions shall be ANSI B16.39 malleable iron, WOG, female pattern, threaded ends, brass seat, with ground joint.

2.  Copper tubing 2½” and smaller - Cast copper unions shall have solder ends, with ground joint.

B.  Flanges:

1.  Steel piping 3” and larger - Welding neck or slip-on type, flat or raised face, forged steel, ASTM A 181, Grade I, ANSI B16.5, Class 150 or 300 as


3. Gaskets shall be 1/16" thick, similar to Garlock or Cranite, factory cut, one piece. Provide full-face gaskets for flat-face flanged joints, and ring gaskets for raised-face flanged joints.

2.19 DISSIMILAR METALS

A. 2" and smaller - Dielectrically isolated unions, couplings or nipples. 2 1/2" and larger dielectrically isolated and gasketed flanges.

2.20 PIPE IDENTIFICATION

A. Identification of piping shall be by the use of colored, waterproofed, all-temperature, self-adhering pipe markers and directional arrows. Acceptable manufacturers: Ready Mode, Seton Style RPM, MAPA Label Tabs, or approved equal.

2.21 TAMPER PROOF FASTENERS

A. Where equipment is specified to have tamper proof or vandal proof fasteners, the Contractor shall coordinate and use the same type of fastener on each item. Provide Owner with two wrenches, screw drivers, etc., for each type of fastener used on the project.

PART 3 - EXECUTION

3.1 INSTALLATION OF VALVES

A. Valves shall be provided where indicated on the drawings or as hereinafter described. Valves shall be installed so that the handle is accessible and operable. Where required due to space limitations, special short style handles may be provided on ball valves. Gate, globe and other style valves having packing glands shall have valve handles installed in the horizontal or vertical (down) position or any angle between to keep packing glands moist.

B. Valves located in walls, chases and above suspended, inaccessible ceilings shall be provided with access doors. Valves located above accessible acoustical tile ceilings shall have the location of each valve marked with a pressure sensitive colored dot applied to the T-bar. Color to be selected by the Architect/Engineer. Valves located above
ceilings indicated to be used for drains, or for future use shall have a pipe plug or nipple and cap closure. Valves in equipment spaces indicated to be used for drains, blowdowns, etc., shall have hose threads for extensions to floor drains. Hose bibbs shall not be used.

3.2 EXCAVATING AND BACKFILLING UNDER BUILDING SLABS

A. The Contractor shall do excavating, trenching and backfilling for the work of this Division. The Contractor shall work around or remove obstructions as necessary. Bottoms of trenches shall be tamped hard. Bell holes shall be excavated to insure that pipe rests on solid earth for its entire length.

B. Backfilling trenches for piping under structural pile supported slabs shall be done by hand. Fill shall be "walked" or hand tamped on each side of pipe to provide compaction that will hold the piping in alignment. The remainder of the trench may be backfilled by hand or approved mechanical means. Care shall be taken during tamping to keep piping in alignment and hanger rods straight and plumb. Refer to DIVISION 2 - SITEWORK for fill material.

C. The Contractor shall remove any water which may be found or may accumulate in the trenches and shall perform work necessary to keep them clear of water while the work is in progress, or as may be required for inspections.

3.3 DISPOSAL OF EXCESS EXCAVATED MATERIAL

A. Excess fill taken from excavations shall, unless otherwise provided in the Contract Documents, be removed as soon as possible as work of this Division.

3.4 SUB-SURFACE OBSTRUCTIONS

A. Care must be taken not to disturb, injure or remove any pipes, cables, conduits or other underground structures or utilities that are to remain. As work of this Division, shore-up and protect underground piping, conduit structures or utilities which may be endangered during the work and maintain such structures and utilities during construction. Sub-surface obstructions shall be uncovered in advance of construction so that the method of avoiding same may be determined before pipe laying reaches the obstructions.

B. In the event subsurface structures, pipes, cables, conduits or utilities are broken or damaged in the execution of the work, the Owner and proper authorities shall be notified and proper repairs shall be made, as work of this Division, to the satisfaction of the Architect/Engineer and authorities involved. Damage to persons or property caused by such breaks shall also be the responsibility of this Division. The Architect/Engineer will, in each case, be the judge of the necessity of expedience of any change or rearrangement.
of any underground structures which may interfere with the construction of the work of this Division.

3.5 SHEETING AND SHORING

A. Sheetings and shorings shall be placed in excavations and trenches as required to suit the ground conditions and to properly and safely support the excavations and trench walls and any adjacent structures. Placement of the sheeting and shoring in the trench shall not restrict the excavation and trench width specified in other Sections. Sheetings and shoring for excavations and trenches less than five feet in depth may be of treated wood. Wood indicated to remain in excavations and trenches shall be treated type. Sheetings and shoring for excavations and trenches greater than five feet in depth shall be of steel construction.

B. The Contractor shall employ a Civil Engineer registered in the state of this project to design the steel sheet piling system required for excavations of five feet or greater. The Contractor shall submit one copy of the Engineer’s sealed calculations and drawings to the Architect/Engineer for record and file purposes only. The Contractor shall be responsible for the design and construction of the sheet piling system.

C. Unless otherwise instructed by the Architect/Engineer wood sheeting, shoring and bracing shall be cut-off at an elevation of 24" below finished grade. The lower portion of the sheeting and bracing below grade shall remain in the ground. If instructed by the Architect/Engineer to remove the wood or steel sheeting and shoring it shall not be removed until backfilling is completed.

3.6 RESTRAINED JOINTS

A. Restrained joints shall be provided for underground water mains 4” and larger and sewer force mains at each change of direction 11\(\frac{3}{4}\) degrees or greater and at tees. Restrained joints shall be installed per NFPA 24.

3.7 RECORD DRAWINGS

A. At the completion of the work, unless noted otherwise in the general conditions, mark-up one reproducible set with colored pencils in a neat and understandable manner to show significant changes made during construction. Provide an electronic copy of the drawings in .pdf format on a disc to be included in the closeout documents. Underground piping, valves and cleanouts outside of the building shall be dimensioned on the record drawings. Dimensions shall indicate the location of exterior mains with reference to the exterior building walls and/or corners. Contractor shall pay for reproduction costs.

3.8 OPERATING INSTRUCTIONS
A. Prior to the time scheduled for occupancy, the Contractor shall provide the services of a competent mechanic to instruct the Owner in the care and operation of equipment. Before final acceptance, the Contractor shall prepare and deliver to the Architect/Engineer three bound copies of operating instructions, which shall be contained in hard back loose leaf type binders, divided into a suitable number of volumes so as to permit easy reference, and shall include:

1. Description of major components of systems, including the function of major items.
2. Detailed operating instructions and instructions for making routine minor adjustments.
3. Routine maintenance operations.
4. Manufacturer’s catalog data, service instructions wiring diagrams, fabrication drawings and parts list for each piece of operating equipment.
5. Copies of equipment submittals and shop drawings, including review sheet, reviewed by and acceptable to the Architect/Engineer.
6. Guarantee and Warranty Information.
7. Names and telephone numbers of subcontractors and suppliers.

3.9 ELECTRICAL WORK

A. Refer to schedules and electrical drawings for motor voltages. Motors for mechanical equipment shall be provided under this Division. The work of this Division shall include setting and aligning integral drive motors in operating position. Unless noted otherwise, combination magnetic starters and, magnetic motor starters for mechanical equipment shall be provided under this Division and installed and electrically connected under DIVISION 16 - ELECTRICAL.

B. Electrical work in connection with DIVISION 15 - MECHANICAL required but not indicated as work of DIVISION 16 - ELECTRICAL shall be work of this Division. Control disconnects, monitoring, level, electrical interlock and signaling wiring and raceways shall be work of this Division. Safety, signaling, and control devices such as thermostats, firestats, damper motors, valve operators, push buttons, pilot lights, control and/or monitoring panels, crank-case heaters, etc., shall be provided and wired under this Division in strict accordance with an approved wiring diagram. Wiring and raceways installed under this Division shall comply with the requirements of DIVISION 16 - ELECTRICAL and shall be installed by a licensed electrician.
3.10 CONCRETE

A. Formed and poured in place concrete work including equipment housekeeping pads, concrete equipment bases that are installed on vibration isolators, and piping supports not provided as work of other Divisions shall be provided as work of this Division and shall be standard weight concrete in accordance with the American Concrete Institute’s Standard Specifications, and shall test at 3000 psi in 28 days.

B. Provide required templates and dimensioned drawings for housekeeping pads, supports, and anchor bolts. A 4" high (min.) reinforced concrete housekeeping pad shall be provided under each piece of exterior and interior floor supported mechanical equipment. Pads shall extend a minimum of 6" beyond edges of equipment. Edges of pads shall be chamfered.

3.11 EQUIPMENT SUPPORTS

A. Unless otherwise specified, supports necessary for properly supporting the work and the equipment of this Division shall be provided under this Division. Additionally, provide isolation materials to prevent transmission of vibration to the building structure. Isolation of equipment as shown on drawings or specified is the minimum required, and any additional isolation required to prevent transmission of vibrations shall be provided under this Division, in accordance with the equipment manufacturer's recommendations. Foundations for supports shall be provided under DIVISION 3 - CONCRETE or DIVISION 5 - METALS.

3.12 SAFETY PANS

A. Provide safety pans under water heaters, hot water storage tanks, fan coil units, air handling units, boilers, etc. Pipe safety pan outlet to floor drain, trapped waste, or to outside of building.

3.13 OPENINGS, GROUNDS AND CHASES

A. Openings, grounds, chases and lintels will be provided under other Divisions, as directed by this Division, to accommodate the piping, ductwork and equipment. Sleeves and prepared openings shall be accurately located in slabs or walls before pouring of concrete. It shall be the responsibility of this Division to verify that openings and chases are properly located. Openings associated with work of this Division not indicated or specified in other Divisions, shall be work of this Division. Coordinate location of grease ducts through roof and arrange for roof framing to be relocated to avoid offsetting of ducts.

B. Holes through existing concrete shall be either core drilled or saw cut. Drilled or cut holes required shall have the approval of the Architect/Engineer prior to cutting or
Jefferson Parish Human Services Authority
Hurricane Repairs and Renovation Project
1500 River Oaks Road West, Elmwood, LA 70123

Sleeves set in openings cut in existing masonry or concrete walls or concrete slabs shall be one pipe size smaller in outside diameter than the cored hole. The sleeve shall be grouted in place with non-shrinking waterproof grout. Where piping is installed through smoke and/or fire separations, fill annular space between sleeve and piping with safing or fire barrier material.

3.14 ACCESS DOORS

A. Equipment which may require constant or periodic operation or adjustment such as but not limited to valves, water hammer arresters, cleanouts, automatic smoke and fire dampers, damper operators, mixing boxes, variable volume equipment, steam traps, plumbing traps, plumbing fixture connections, etc., located in or above inaccessible ceilings, walls, or chases shall have hinged metal access doors as required by type of construction.

B. Minimum door size shall be 8" x 8". Doors shall be of sufficient size to adequately service, repair, replace or inspect the equipment. Locations of access doors in ceilings shall be coordinated to avoid conflict with ceiling mounted devices (lighting fixtures, fire alarm devices, ceiling diffusers, sprinkler heads, etc.). Locations shall be approved by the Architect/Engineer.

3.15 PIPE SLEEVES

A. Piping and tubing installed through masonry or concrete walls, concrete floors above grade, exterior metal wall panels, and smoke or fire rated partitions shall be installed through pipe sleeves as hereinbefore specified.

B. Sleeves are not required for soil, waste, vent, storm drainage, fire protection, or domestic water piping through slabs on grade or fill. Any other piping shall be provided with sleeves. Sleeves shall be finished flush with both sides of wall. Sleeves through floors above grade shall project a minimum of 2" above finished floors. Sleeves through exterior metal wall panels shall be installed to prevent water from entering around perimeter of sleeve. Diameter of sleeves shall be large enough to provide a 1/4" minimum annular space between pipe and sleeve or insulation and sleeve. Annular space shall be large enough to accommodate pipe movement due to expansion or contraction.

C. Where piping or tubing is installed through fire or fire/smoke rated separations, the annular space between the piping or tubing and sleeve shall be filled with UL Classified fire barrier material. Where piping or tubing is installed through smoke rated separations, the annular space between the piping or tubing and sleeve shall be packed solid with safing material. Annular space between pipe or tubing and sleeve installed through exterior walls shall be made waterproof by filling with a silicone type caulking compound on the exterior side only. Annular space between pipe and sleeve installed through basement walls, floors and slabs on grade or fill and slabs below water level shall
be made waterproof by using a mechanically expandable seal, or an approved equal means.

3.16 SUPPORTS

A. Hangers, guides, brackets and braces shall be adequately fastened to the structure by means of concrete inserts, drilled expansion shields, drilled wedge type devices, bolts or beam clamps. Powder driven fasteners shall not be used. Inserts in slabs and beams for fastening work shall be cast in place in new slabs. Inserts required in existing concrete shall be drilled type. Drilling shall not penetrate the post-tensioning tendons.

B. Where building construction consists of a metal roof supported by metal purlins, provide additional steel members to span between roof supports to provide supports for hanger rods.

3.17 GENERAL PIPING INSTRUCTIONS

A. Exposed and concealed horizontal lines of pipe and tube shall be carried on hangers and supports hereinbefore specified and properly spaced to maintain alignment. Install pipe and tubing true to line and grade. Piping shall be concealed except where noted. Piping shall be installed above suspended ceilings and in furred partitions. Exposed piping shall be installed parallel to or at right angles with building walls, except where otherwise shown on drawings. Changes in elevation, to suit varying ceiling heights, shall be made so that piping will stay exposed. Exposed pipe through walls, floors and ceilings shall be fitted with chromium plated escutcheons securely held in position with allowance for expansion. Escutcheons shall be large enough to fit the pipe, tubing or insulation and to cover openings around the sleeves through walls. Minimum bury for exterior piping shall be 18" below finish grade, unless noted otherwise on drawings or in specifications. PVC water mains shall have 30" minimum cover.

B. Wherever changes in sizes of piping occur, changes shall be made with reducing fittings. The use of reducing couplings in rolled or cut groove joint piping or bushings in other piping systems will not be permitted.

C. Cutting and boring through structural members shall be done only when approved by and under supervision of the Architect/Engineer. Offsets in piping above slab shall be made with fittings. Bending of pipe shall not be permitted. Automatic valves or traps shall be provided with unions and shut-off valves so that they can be removed for servicing. Valving shall also be arranged so as to eliminate the necessity of draining major parts or entire system while service or repairs are made. Drains where required by manufacturer and at each low point or trapped area of each system shall be provided.

3.18 CONNECTION OF COPPER TUBING
A. Copper tubing shall be cut with square ends, and burrs and fins removed. Tubing shall be handled and protected carefully and tubing cut, dented, or otherwise damaged shall be replaced. Ends of tubing and fittings shall be cleaned using sand or emery cloth.

B. Copper Water Tube: Apply a thin coat of flux to end of tube and solder cup. Insert tube into fitting full depth and apply heat. Apply solder until bead appears at end of fitting. Clean excess solder and flux from completed joint.

C. Copper Refrigerant Tube: Refrigerant piping shall be installed so proper oil drainage and entrainment are maintained. Materials used in the construction and installation of refrigerant piping system shall be suitable for the refrigerant used and no material shall be used that will deteriorate due to the chemical action of the refrigerant or the oil or the combination of both. Equipment and piping openings shall be plugged or capped to prevent air, dirt, or moisture from entering the system. Piping must be thoroughly cleaned before the system is charged with refrigerant. Suction lines shall be pitched no less than \( \frac{1}{2} \)" per 10' toward the compressor. During the brazing process dry nitrogen shall be bled continuously through the piping.

3.19 CONNECTION OF SCREW JOINTED PIPING

A. Piping shall be square cut and free from fins, burrs, die marks, etc. Threads shall be full cut to depth of die. Apply approved lubricant or thread sealing tape on male threads only. Screw fitting and pipe together using pipe wrenches so that not more than three threads remain exposed on pipe. Clean excess joint material from completed joint. Joints in galvanized piping systems shall be cleaned and sprayed with two coats of zinc rich rust inhibiting paint.

3.20 CONNECTION OF WELDED JOINT PIPING

A. Welded joints shall conform to the requirements of ANSI B31.1. Welders shall be qualified using shielded metal arc welding process or other approved process in accordance with the applicable provisions of the ASME Boiler and Pressure Vessel Code, Section IX. Prior to erection, each length of pipe shall be held in an inclined position and repeatedly tapped to loosen any scale or foreign matter within the pipe. Each length of pipe shall be thoroughly swabbed prior to erection.

3.21 CONNECTION OF GROOVE JOINTED PIPING

A. Piping shall be inspected and verified free from indentations, projections, grooves, weld seams or roll marks on the exterior pipe surface over the entire gasket seating area to insure a leak-tight gasket seating. Pipe ends shall be square cut. Cut and roll grooves shall meet the manufacturer's criteria. Gasket, pipe ends and coupling
housing shall be properly lubricated per manufacturer’s recommendations prior to seating and aligning.

3.22 SUPPORTS AND CLAMPS

A. Vertical support and bracing for risers shall be by use of riser clamps at every floor but not less than 15'-0" o.c. Horizontal piping above grade and within buildings shall have supports and rods adequate for size, material and service, and be supported at not more than the following intervals on straight runs of piping:

MAXIMUM SUPPORT SPACING - CAST IRON PIPING

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>SUPPORT SPACING</th>
<th>MIN. HANGER ROD-DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot;</td>
<td>5'-0&quot; and at each Joint</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>3&quot;</td>
<td>5'-0&quot; and at each Joint</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>4&quot;-5&quot;</td>
<td>5'-0&quot; and at each Joint</td>
<td>5/8&quot;</td>
</tr>
</tbody>
</table>

MAXIMUM SUPPORT SPACING - STEEL AND COPPER PIPING

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>SCREWED, WELDED JOINTS</th>
<th>SOLDIERED &amp; GROOVED JOINTS</th>
<th>MIN. HANGER ROD DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>½&quot; to 1¼&quot;</td>
<td>6'-6&quot;</td>
<td>6'-6&quot;</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>1½&quot; to 2&quot;</td>
<td>10'-0&quot;</td>
<td>7'-6&quot;</td>
<td>3/8&quot;</td>
</tr>
<tr>
<td>2½&quot; to 3&quot;</td>
<td>10'-0&quot;</td>
<td>10'-0&quot;</td>
<td>1/2&quot;</td>
</tr>
<tr>
<td>4&quot; to 6&quot;</td>
<td>10'-0&quot;</td>
<td>10'-0&quot;</td>
<td>5/8&quot;-¾&quot;</td>
</tr>
</tbody>
</table>

B. Unless otherwise detailed on the drawings, underground piping shall have hanger rod sizes as listed below to support the piping at not more than the following intervals on straight runs of piping:

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>MAX. SUPPORT SPACING</th>
<th>MIN. SUPPORT ROD DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>½&quot; to 6&quot;</td>
<td>4'-0&quot;</td>
<td>¼&quot; *</td>
</tr>
</tbody>
</table>

* If allthread rod is used in lieu of smooth rod, allthread rod shall be one size larger.

C. When interior support rods for pressurized piping are over 12" in length, provide lateral bracing every fourth hanger or as required to prevent swaying. Offsets or bends in hanger rods or pipe hanging from pipe are not acceptable. Piping shall be racked
and handled in a manner to prevent entrance of dirt and foreign matter. Open pipe ends shall be plugged or capped during erection. Horizontal pipe shall be supported not over 1' from the fitting at each change in horizontal direction or vertical elevation of the piping. Pipes must be installed so that they may contract or expand freely without damage to other work or injury to themselves.

D. In securing rods and hangers to wood or metal, angle clips, beam clips or C-clamps shall be used. Angle clips must be attached to structure by means of screws or bolts. Securing rods to concrete shall be as hereinbefore specified. Trapeze supports with U-bolts, pipe straps or clamps may be used where two or more pipes run parallel at the same elevation. Perforated type strap hangers shall not be used. Exterior pipe supports shall be hot dipped galvanized after fabrication.

E. Vibrations or movement developing in piping shall be eliminated or isolated by re-spacing of supports, anchoring or installation of spring supports as directed. Refrigerant liquid piping shall be isolated by providing a 6" long piece of ¾" thick elastomeric type insulation between pipe and hanger. Insulated piping with a normal operating range of 55 degrees or less, provide a 20-gauge sheet metal saddle approximately 12" long and having 180-degrees of contact with insulation between the hanger or support and the insulation for each pipe. Insulated piping with a normal operating range of 56 degrees or greater may have the hanger installed between the pipe and the insulation. Where individual pipe supports are installed outside of the insulation jacket or trapeze supports are used to support insulated pipes, a galvanized sheet metal saddle, as described above, shall be installed between the support and the insulation.

F. Piping and fittings below pile supported slabs on grade or fill shall be supported as follows:

1. Piping shall be hung on 4' centers.

2. PVC piping shall have one or two 12" long solid wall PVC half-sleeves installed between the hanger and the pipe as indicated in the Contract Documents.

3. Additionally waste and vent, storm drainage, acid waste and vent, greasy waste and vent fittings shall be hung as follows:
   a. Vertical combinations, wye and eighth bends and up-right tees shall have two hangers.
   b. Horizontal combinations, wye and eighth bends and tees shall have three hangers.
   c. Horizontal double combinations, double wye and eighth bends and crosses shall have four hangers.

3.23 UNIONS OR FLANGES
A. Unions or flanges shall be provided at items of equipment to facilitate their easy maintenance, including tube bundle or coil removal, and/or cleaning. It shall not be necessary to remove any valve, strainer, or device to do the required maintenance. Piping connections at equipment shall be in accordance with the current engineering and installation practices. The requirements of this paragraph will be strictly enforced and if in the opinion of the Architect/Engineer it is not adhered to, the Contractor will be required to re-pipe the equipment as directed.

3.24 WORK RELATED TO EQUIPMENT NOT FURNISHED AS WORK OF THIS DIVISION

A. Unless specifically indicated otherwise, any required mechanical services for and required mechanical connections to items indicated on the drawings or in the specifications or items provided by the Owner shall be mechanically connected as work of this Division. The Contractor shall provide piping, valves, traps, etc., as required for complete operation of each piece of equipment.

3.25 DISSIMILAR METALS

A. Inert NSF/FDA lined dielectric nipples shall be provided between copper, bronze or brass piping material or valves and steel piping material or steel tanks. Dielectric nipples and brass or copper unions or flanges shall be provided at cast iron valves and equipment where hereinafter specified for equipment maintenance. Dissimilar metals shall be isolated from surface contact with each other by the use of a non-conductive material, tape, etc.

3.26 PROTECTION OF WORK

A. The Contractor shall protect equipment, fixtures, and work from damage. Damaged work will be rejected and replaced at the expense of the Contractor. Where possible, rooms containing new plumbing fixtures shall be kept locked until the building is turned over to the Owner. Immediately after installation of each plumbing fixture, it shall be covered with a fixture protector.

B. Mechanical equipment shall be protected from damage and from the weather. Provide adequate and proper storage facilities for items during the progress of the work.

3.27 CLEANING OF EQUIPMENT AND MATERIAL

A. Prior to acceptance, the Contractor shall clean equipment and remove grease, dirt and foreign matter. Pressure regulating assemblies, traps, strainers, flush valves and similar items shall be thoroughly cleaned. Air, oil and natural gas piping shall be blown out with clean compressed air. When connections are made to existing systems,
the Contractor shall do cleaning and purging of the existing systems required to restore them to the condition existing prior to the start of work.

3.28 FRICTION LOSSES, ELECTRICAL RATINGS AND SPACE REQUIREMENTS

A. The values of air and water friction losses, electrical current ratings and space requirements for various pieces of equipment, as contained in these specifications or as scheduled, are estimated values and sizes and have been used in obtaining specifications for equipment and for sizing ducts, pipe, electric wiring and motor controls. Any necessary changes in any of these items resulting from values other than the estimated ones shown shall be the responsibility of the Contractor and shall be subject to the approval of the Architect/Engineer. The Contractor shall pay any costs for additional labor and material required including costs of any other Contractor involved. Should substitute equipment require different requirements from that shown on the drawings, the Contractor shall be responsible for the cost of the changes. Any such changes must be approved by the Architect/Engineer.

3.29 MARKING OF EQUIPMENT

A. Each piece of mechanical equipment shall be suitably identified by means of ¼” high letters cut in white laminated phenolic strip to show black letters. Mechanical equipment, such as but not limited to, boilers, air handling units, exhaust fans, starters, etc., shall be labeled. Strip shall be secured to interior equipment using self-adhesive backing and to exterior equipment by means of two brass bolts and nuts or screws.

3.30 IDENTIFICATION OF PIPING

A. Piping, whether insulated or not shall be identified. Identification may be omitted from piping in inaccessible chases and furring and where use is obvious, due to its connection to fixtures or equipment and where the appearance would be objectionable, as in finished rooms.

B. Identification shall be placed as follows - near each valve and branch connection, above accessible ceilings wherever piping emerges or disappears from view when viewed from the floor of the room in which it is installed, labels shall not be more than 10’ apart.

3.31 CHANGES TO PIPING OR DUCTS

A. Should the Contractor desire to make changes in the routing or arrangement of piping or ducts, whether for his own convenience, to avoid conflict with the work of other trades, or to conform to local codes, such changes shall not be made without the prior approval of the Architect/Engineer.
3.32 STARTING AND TESTING

A. A competent and experienced service and installation mechanic shall be employed by the Contractor to start test and adjust the equipment. The Architect/Engineer reserves the right to require the test of any item of equipment or machinery. Such tests shall be conducted by the Contractor in the presence of the Architect/Engineer.

3.33 PROJECT CLOSEOUT DOCUMENTS

A. Prior to the final acceptance of the project the Contractor shall deliver to the Architect/Engineer for review, the following in two three-ring binders:

1. Certificates of approval from local regulatory agencies.
2. Extended equipment warranties.
3. Signed receipts showing that keys to access doors, locked equipment, underground valve wrenches and vandal-proof screwdrivers have been delivered to the Owner.
4. Operating instruction manuals which shall include copies of reviewed submittals and shop drawings including review sheet.
5. Results of potable water sterilization tests.
6. Performance tests of backflow preventer.
7. HVAC test and balance reports (Hard copy and PDF).
8. Record drawings.

B. Final payment will be withheld until each applicable item has been provided to and is found satisfactory by the Architect/Engineer.

- END OF SECTION -
SECTION 221000 - PLUMBING SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Work under this Section shall include providing a complete and functioning plumbing system for the project and any appurtenances indicated or necessary. The systems shall include but shall not be limited to the following:

B. Work under this Section shall include providing a complete and functioning plumbing system for the project and any appurtenances indicated or necessary. The systems shall include but shall not be limited to the following:

1. Sanitary system (sewer, soil, waste, and vent)
2. Domestic water system (hot and cold)
3. Plumbing fixtures
4. Associated equipment

C. Items specified or required shall be provided for a complete and operating system as described in SECTION 15010 - MECHANICAL GENERAL PROVISIONS.

1.2 BACKING

A. Each plumbing fixture not specified to be installed on a concealed chair carrier shall be provided with proper backing within the wall. Such backing shall be provided under other Divisions as directed by this Division.

1.3 SPECIAL REQUIREMENTS

A. PVC piping shall not be installed in any above ceiling plenum space or any mechanical equipment room used as a return air plenum.

1.4 ELECTRICAL WORK

A. Electrical work in connection with work of this Section not indicated as work of DIVISION 16 - ELECTRICAL, including disconnect switches for control wiring, shall be work of this Section.

PART 2 - PRODUCTS

2.1 VALVES (Plumbing)
A. Valves shall be as listed below unless otherwise noted on the drawings. All valves for use in potable water system shall be lead free model of the valves listed below:

1. Water shut-off valves above grade:
   
   a. 4" and smaller - Nibco Series S-FP-600N or Watts Series B, full port ball valve; 600 psi ASTM B-283 bronze body, ASTM B-16 chrome plated brass ball and stem; PTFE seats, packing, and gaskets; solder ends; two piece construction with lever handle. Acceptable manufacturers: Conbraco, Hammond, Red-White, Milwaukee, Nibco, Watts, or approved equal.

2. Water throttling valves above grade:
   
   a. 2" and smaller - Nibco Series S-585-70 or Watts Series B-6081-BS full port ball valve; 600 psi ASTM B-124 bronze body, ASTM B-16 brass ball and blowout proof stem; PTFE seats, packing, and gaskets; solder ends; memory stop plate; two piece construction with lever handle. Acceptable manufacturers: Conbraco, Hammond, Red-White, Milwaukee, Nibco, Watts, or approved equal.

3. Water check valves above grade:
   
   a. 2½" and smaller - Nibco Series S-413 or Watts Series WCV, 150 psi swing check; ASTM B 62, bronze body, and disc holder; composition type removable disc; soldered ends. Acceptable manufacturers: Crane, Hammond, Red-White, Milwaukee, Nibco, Watts, or approved equal.

   b. 3" and larger - Nibco Series F-918 or Watts Series WCV, 125 psi swing check; ASTM A 126, iron body with ASTM B 62 bronze disc and seat ring; flanged ends for ANSI standard 150 psi flanges. Acceptable manufacturers: Crane, Hammond, Red-White, Milwaukee, Nibco, Watts, or approved equal.

   c. At the Contractor's option he may furnish for each 2½" and larger check valve above grade, Nibco #F-910 or Metraflex #900, 125 psi flanged globe style check valve; ASTM A 48, Class 35 cast iron body with ASTM B 584 bronze seat and disc; flanged ends for ANSI standard 150 psi flanges. Acceptable manufacturers: Bell & Gossett, Metraflex, Mussco, Nibco, or approved equal.

4. Water shut-off valves underground:
a. 2½" and smaller - Nibco #S-113 or Hammond #IB647 solid wedge, non-rising stem gate valve; 200 psi ASTM B 62 bronze body and wedge; TFE impregnated asbestos packing; solder ends; and stem extension to bring handle to within 9" (±) of finished grade. Acceptable manufacturers: Crane, Hammond, Red-White, Milwaukee, Nibco, or approved equal.

b. 3" and larger - Nibco #F-619-SON or Hammond #IR1138 solid wedge, non-rising stem, bronze mounted gate valve; 200 psi ASTM A 126, Class B iron body; ASTM B 62 wedge face ring on iron wedge; flanged ends for ANSI standard 125 psi flanges; #341, 2" square operating nut. Acceptable manufacturers: Crane, Hammond, Red-White, Milwaukee, Nibco, or approved equal.

5. Water check valves underground - Same as hereinbefore specified for check valves above grade.

B. Ball and throttling valves installed in insulated piping shall have factory furnished metal stem extensions suitable for the thickness of the insulation installed. Each type of valve furnished for the project shall be the product of the same manufacturer; i.e., each ball valve or butterfly valve, unless prior written deviation is given by the Architect/Engineer.

2.2 TAPPING SLEEVE AND VALVE

A. Tapping sleeve shall be suitable for installing on the existing water main. Sleeve shall have Class 125 outlet flange. Sleeve shall be rated at 200 psi. Bolts and nuts shall be stainless steel hexagon head with stainless steel washers. Acceptable manufacturers: Dresser, Kennedy, or approved equal.

B. Tapping valve shall be non-rising stem (NRS) gate valve, flanged by mechanical joint. Valve shall be iron body ASTM A 126, bronze mounted parallel seats ASTM B 62, 175 psi rated, with indicator post flange and 2" square wrench nut turning counter-clockwise to open. Valve shall be UL and/or FM listed. Bolts nuts and washers shall be stainless steel. Acceptable manufacturers: Kennedy, M & H, Mueller, or approved equal.

2.3 FLOW-BALANCING DEVICES

A. Body of the device shall be of cast iron construction. Indicating device shall be of stainless steel and sight glass shall be borosilicate glass. Device shall be capable of operating at 125 psig and 250 degrees F. Working parts must be able to be removed without breaking the piping connections. Device shall provide a visual reading of the flow without using external attachments. A built-in balancing valve shall provide external
adjustments. Acceptable manufacturers: 1-9 gpm - Bell & Gossett Model TB-1; 10 gpm and higher - Bell & Gossett Model TFI, or approved equal.

2.4 PIPE, FITTINGS, AND JOINTS

A. Soil, Waste, and Vent:

1. Underground and underslab pipe and fittings:

   a. Service weight, centrifugally spun, cast iron pipe, and drainage type fittings with hub and spigot ends, ASTM A-74; pipe and fittings shall be coated per ASTM A-74; joints shall be neoprene insert type compression gaskets, ASTM C-564. Cast iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International.

2. Above grade pipe and fittings:

   a. Service weight, centrifugally spun cast iron pipe and drainage type fittings with plain or beaded ends, ASTM A 888 and CISPI 301; pipe and fittings shall be coated per ASTM A-74. Cast iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and listed by NSF International. Joints shall be neoprene elastomer sleeve with stainless steel shield and clamp assembly; sleeve shall bear the ASTM C 564 marking, clamp shall bear the CISPI 310 NO-HUB marking. Horizontal waste arms between stacks and plumbing fixtures shall be hard drawn, copper drainage tube, type DWV, ASTM B 306, or seamless copper water tube, type L, ASTM B 88; fittings shall be wrought copper drainage type, ASME B16.29 or cast copper drainage fittings, ASME B16.23; joints shall be solder type using 95-5 type tin-antimony solder, ASTM B 32, Alloy grade 95A.

B. Domestic Water:

1. Pipe and fittings under slabs on grade:

   a. Piping 1½" and smaller - Seamless copper tube, type L, soft annealed, ASTM B 88. No joints will be allowed below the slab. Turn piping up and make joints above the slab.

   b. Piping 2" through 3" - Seamless copper water tube, type L, hard drawn, ASTM B 88; fittings shall be wrought copper pressure type ANSI B16.22 or cast bronze pressure type, ANSI B16.18; joints shall be silver
soldered using brazing alloys AWS A5.8, melting at or above 1000 degrees F.

2. Pipe and fittings above grade:

   a. Piping 2½” and smaller - Seamless copper water tube, type L, hard drawn, ASTM B 88; fittings shall be wrought copper pressure type, ASME B16.22 or cast copper pressure type, ASME B16.18; joints shall be solder type using 95-5 type tin-antimony solder, ASTM B 32, alloy grade 95A.

   b. Piping 3” and larger - Seamless copper water tube, type L, hard drawn, ASTM B 88; 3” and 4” fittings shall be roll grooved wrought copper pressure type, ASTM B 75; 5” and larger fittings shall be roll grooved, ASTM B 584; joints shall be made by using a two piece malleable coupling, ASTM A 47, or ductile iron, ASTM A 536 housing; gasket shall be molded EPDM suitable for -30 degrees to +230 degrees Fahrenheit; bolts and nuts shall be track-head, heat treated carbon steel, ASTM A 183.

2.5 WATER HAMMER ARRESTERS


2.6 CLEANOUTS AND COVERS

   A. Cleanout plugs installed in cast iron and copper piping systems shall be cast brass, flanged type with raised square head, CSS301. Cleanout plugs installed in plastic piping systems shall be of same material and have raised square head.

   B. Covers installed outside the building shall be cast iron, 10" diameter, with a cast iron ring. Word "SEWER" or "DRAIN" shall be cast on the cover. Covers installed inside the building in un-carpeted floors shall be cast nickel brass, 10" diameter, with a scoriated satin finish and brass ring. Acceptable manufacturers, Josam #58610-10, Smith #4810, Wade, Zurn, or approved equal. Cleanouts installed in carpeted floors shall be a cast iron cleanout with adjustable nickel brass top with carpet clamping plate. Acceptable manufacturers Josam #5610-X, Smith #4020S-X, Wade, Zurn, or approved equal.

2.7 INSULATION AND ACCESSORIES

   A. Insulation shall have a vapor barrier jacket or facing complying with NFPA 90A fire and smoke hazard rating as determined by Underwriters Laboratories procedure
UL 723, ASTM E 84 and NFPA 255 not to exceed a flame spread of 25 and smoke developed of 50. Maximum jacket permeability (if jacketed) shall be 0.02 perms per ASTM E 96. Accessories such as adhesives, mastics, cements, tapes, etc., shall have the same fire and smoke hazard rating as jacket or facing.

B. Fiberglass insulation:

1. Pre-formed, split type, fiberglass pipe insulation with an all service jacket having a maximum "k" factor per ASTC C 335 of 0.23 Btu×in/hr×ft²×°F at a mean temperature of 75 degrees F. Acceptable manufacturers: Certainteed 500 Snap-on, Owens-Corning 25 ASJ/SSL, or approved equal.

2. Domestic cold water piping - ½" thick.

3. Domestic hot water supply piping. Branch piping 2" and smaller not exceeding 12'-0" in length - ½" thick. Branch piping exceeding 12'-0" in length and main piping 2" and smaller - 1" thick. Main piping 2½" and larger 1½" thick.

4. Fitting insulation shall be blanket type, ¾ pound per cubic foot density, commercial grade duct wrap with foil facing having a maximum "k" factor per ASTM C 518 of 0.32 Btu×in/hr×ft²×°F at a mean temperature of 75 degrees F. Acceptable manufacturers: Certainteed Standard Duct Insulation, Owens-Corning Commercial Faced Duct Wrap, or approved equal.

C. Fitting and valve insulation:

1. Fiberglass blanket insulation equal in thickness to the adjacent pipe insulation, field cut to fit fittings. Valves shall be insulated using oversized pipe insulation field cut to fit valves.

D. Accessories:

1. Fitting Covers - Preformed, one-piece, snap-on PVC jacket covers for fittings. Rated at 25/50 per ASTM E-84. Acceptable manufacturers: Certainteed Snap-Form, Proto LoSmoke, Zeston, or approved equal.

2. PVC Jackets - Smooth white PVC, 0.02" thick with self-sealing strip. Rated at 25/50 per ASTM E-84. Acceptable manufacturers: Proto LoSmoke or approved equal.

2.8 FIXTURES AND TRIM

A. Before ordering fixtures, the contractor shall review field conditions and shall coordinate with work of other trades including:
1. Coordinate all fixtures with cabinets details and counter tops to ensure adequate clearance and proper flange type for installation at each location.

2. Coordinate with Architectural drawings to ensure that the each fixture type matched that is shown on the Architectural drawings.

3. Confirm that ADA fixtures are provided with appropriate ADA trim and accessories for full ADA compliance.

4. Confirm left/right hand features.

5. Confirm clearances for carriers.

B. Fixtures shall be provided with traps, set true and plumb, and securely fastened in place. Supply pipes to fixtures shall be fitted with stop valves. Exposed metal parts, trimmings, piping, fittings, valves, etc., shall be chromium plated brass. Heavy pattern cast iron floor flanges or threaded nipples with suitable gaskets to make joints gas and watertight shall be used on china fixtures.

C. China fixtures shall be white (unless otherwise noted) and shall be as manufactured by American Standard, Crane, Eljer, or Kohler.

D. Stainless steel sinks shall be as manufactured by Elkay or Just.

E. Electric water coolers shall be as manufactured by Elkay, Halsey Taylor, Haws, Oasis, Murdock or Sunroc.

F. Standard type brass supply fittings and trim shall be as manufactured by American Standard, Crane, Eljer, Kohler, Speakman, or Delta HDF. Hot and cold water valves on supply fittings shall be 1/4-turn cartridge type.

G. Flush valves shall be as manufactured by Delany, Sloan, or Zurn.

H. Drains and fixture carriers shall be as manufactured by Josam, Smith, Wade, Watts, Sun or Zurn.

I. Water closet seats shall be as manufactured by Beneke, Bemis, Church, Jones Stephens, Olsonite, or Centoco.

J. Terrazzo mop basins shall be as manufactured by Fiat or Stern-Williams.

K. Specialty type brass supply fittings and trim shall be as manufactured by Chicago Faucet, T&S Brass, Elkay or Zurn.
L. Shower valves and heads shall be as manufactured by Leonard or Powers.

M. Fixtures:

1. Water Closets:
   a. (WC-1) Sloan #WETS-8009.8013 or Gerber # 20-312 floor mounted, INTELLI-Flush 503 series pressure assisted tank, 1.6gpf siphon jet, elongated vitreous china bowl, with close coupled vitreous china tank, cover and bolt caps.
      1) INTELLI-Flush with on-wall sensor, 503 adapter kit, override button, sealed battery.
      2) Church #9500SSC or Centoco #1500CCSS solid white plastic open front elongated seat with check hinge and stainless steel hinge posts.
      3) Flexible chrome plated copper or brass supply riser with cone or flanged top, chrome plated wall extension and wheel handle compression stop.
   b. (WC-2) ADA fixture, Sloan #WETS-8029.8113 or Gerber # 21-318 floor mounted, INTELLI-Flush 503 series pressure assisted tank, 1.6gpf siphon jet, elongated vitreous china bowl, with close coupled vitreous china tank, cover and bolt caps. Where required furnish tank with right hand trip-lever.
      1) INTELLI-Flush with on-wall sensor, 503 adapter kit, override button, sealed battery.
      2) Church #9500SSC or Centoco #1500CCSS solid white plastic, open front elongated seat with check hinge and stainless steel hinge posts.
      3) Flexible chrome plated copper or brass supply riser with cone or flanged top, chrome plated wall extension, and wheel handle compression stop.

2. Lavatories:
a. (L-2) ADA fixture, American Standard Ovalyn #9482.000 or Kohler Caxton #K-2211 lavatory, undercounter vitreous china bowl, with overflow; size - 20"x17". Install at ADAAG height.

1) Sloan #ETF-600-B ADAAG compliant, sensor activated, 24 VAC, chrome plated 4" centerset brass faucet; #2, hot and cold back check valves; #P-Plug-in 120 VAC/24 VAC transformer; #M1X-60-A - mechanical mixing valve; #ETF-460-A - chrome plated brass grid type strainer.

2) Lead free ASSE 1070 compliant point of use mixing valve, 3/8" O.D. Chrome plated compression tee, Flexible chrome plated brass supply risers with cone or flanged top.

3) 1¼"x1½" 17-gauge cast brass, slip joint type P-trap.

4) Flexible chrome plated brass supply risers with cone or flanged tops, chrome plated wall extensions, and 1/4 turn wheel handle angle compression stops.

5) Truebro LavGuard or equal trap and pipe insulation.

3. Urinals:

a. (U-2) ADA fixture, American Standard Lynnbrook #6601.012 or Kohler Bardon #K-4960-ET wall hung, siphon jet or washout, vitreous china urinal with integral trap, 3/4" top spud with wall hanger. Install at ADAAG height.

1) Sloan Optima #8186 or Delany Impulse #1451 top-mounted, battery-powered, sensor-activated, 1.0 gpf flush valve with screwdriver stop and vacuum breaker.

4. Electric Water Coolers:

a. (EWC-2) ADA fixture, Elaky model EZSTL8WSSK or equal wall hung hi-low water cooler with optional ADA skirt and bottle filling station. Receptor, backsplash, and cabinet enclosure shall be stainless steel finish. Compressor shall be mounted below receptor. Capacity at 80 F ambient shall be 8.0 gph of 50 F water. Compressor shall be air cooled, 1/15 hp, 4.8 amps at 115 volts. Install at ADAAG height.
i)  1¼" x 1½" 17-gauge tubular brass, slip joint type P-trap.

2)  Flexible chrome plated copper or brass supply riser with cone or flanged top and wheel handle compression stop.

3)  In wall Bi-Level fountain carrier.

5. Sinks:

   a.  (S-1) Elkay Lustertone ELUH1814 or equal, 18-gauge, type 304 stainless steel, under mounted, single compartment countertop bowl.

      1)  Elkay #LKD-2439 or Just #JWF-200-R70 8" spread mixing faucet with restricted arc gooseneck spout, 1/4 turn lever handles, and aerator for three hole punching.

      2)  Elkay #LK-18B or Just #J-35-SSF perforated waste, type 302 stainless steel; 1½" chrome plated brass tailpiece.

      3)  1½" x 2" 17-gauge cast brass, slip joint type P-trap.

      4)  Flexible copper or brass supply risers with cone or flanged tops and wheel handle 1/4 turn angle compression stops.

6. Mop Basin:

   a.  (MB-1) Williams Serviceptor, Series SB or Fiat Series TSB-100, 36 x 24 one piece 12" high precast terrazzo basin and integral cast drain body with 3" flat type 316 stainless steel strainer.

      1)  American Standard #8354.112 or Speakman #SC-5811-RCP-CK wall mounted mixing faucet with integral stops, check valves, vacuum breaker and wall brace.

      2)  Williams #T-35 or Fiat #E832-AA, 36" long x 5/8" rubber hose and stainless steel hose bracket.

      3)  Stainless steel protective curb cap integrally cast on all sides.

      4)  3" cast iron P-trap.

7. Service Sinks:
a. (SS-1) American Standard Lakewell #7692.008 or Kohler Bannon K-6716 enameled cast iron with wall hanger and drilled back for faucets; size - 22" x 18".

1) American Standard Heritage #8341.076 or Kohler #K-8906 rough chrome finish supply fitting with vacuum breaker in spout, bucket hook, indexed lever handles and stops in shanks.

2) Chrome plated strainer outlet.

3) American Standard #7798.020 or Kohler #K-6672 acid-resisting inside enameled cast iron P-trap standard with painted exterior chrome plated strainer, and supporting flange; 2" size.

2.9 MOUNTING HEIGHTS OF PLUMBING FIXTURES

A. Mounting heights of plumbing fixtures shall be verified against the Architectural drawings and plumbing fixture manufactures specifications sheets to ensure that the each fixture type is installed at the correct height. Where discrepancies exist, the contractor shall review with the Architect for the final mounting height of the plumbing fixture(s) in question.

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Standard Height</th>
<th>Adult ADAAG</th>
<th>Kindergarten / (Pre-K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.C.</td>
<td>15&quot; rim to floor</td>
<td>*17&quot; - 19&quot; seat to floor</td>
<td>*15&quot;/(*11&quot;) seat to floor.</td>
</tr>
<tr>
<td>L.</td>
<td>31&quot; rim to floor</td>
<td>34&quot; rim to floor</td>
<td>30&quot;/(22&quot;) rim to floor</td>
</tr>
<tr>
<td>U.</td>
<td>24&quot; rim to floor</td>
<td>17&quot; rim to floor</td>
<td>------------------------</td>
</tr>
<tr>
<td>E.W.C.</td>
<td>40&quot; rim to floor</td>
<td>36&quot; spout outlet to floor</td>
<td>30&quot; rim to floor</td>
</tr>
<tr>
<td>H.W.</td>
<td>31&quot; rim to floor</td>
<td>29&quot; bottom of apron to floor</td>
<td>30&quot; rim to floor</td>
</tr>
<tr>
<td>S.</td>
<td>36&quot; rim to floor</td>
<td>**34&quot; rim to floor</td>
<td></td>
</tr>
<tr>
<td>SH.</td>
<td>48&quot; centerline of controls to floor</td>
<td>43&quot; centerline of controls to floor</td>
<td></td>
</tr>
<tr>
<td>S.S.</td>
<td>26&quot; rim to floor</td>
<td>------------------------</td>
<td></td>
</tr>
</tbody>
</table>
M.B. 36” centerline of fitting to floor

*Handle for flush valve in barrier-free stall shall be mounted to wide side of stall, refer to architectural drawings.

**Sink bowl shall be 6½” deep (max.).

2.10 DRAINS - Refer to DRAIN SCHEDULE on drawings for each required drain.

2.11 ELECTRIC WATER HEATER

A. Heaters shall be a NAECA listed commercial vertical electric storage type, fit the allocated space, be suitable to operate on the voltage indicated and have the capacity scheduled on the drawings. Tank shall be of steel construction, lined with a high temperature glass coating and shall be furnished with a magnesium anode rod. Tank shall have a minimum working pressure of 150 psi. Entire tank shall be wrapped in a heavy fiberglass insulation blanket and encased in a factory finished metal jacket.

B. Heater shall be factory pre-wired and tested and shall be UL listed. Heating elements shall be immersion type with surface mounted thermostat and shall have manual reset high limit control. A suitable sized ASME temperature and pressure relief valve shall be furnished and installed. Acceptable manufacturers: A.O. Smith, National, Ruud, State, or approved equal.

2.12 THERMAL EXPANSION TANK

A. Upper and lower domes of the tank shall have an outer shell of steel construction designed for 150 psi working pressure and 240 degrees F temperature. The shell shall be specifically designed for a replaceable bladder tank. Tank shall be finished with zinc chromate primer. An integral support base shall be provided on floor models. Seamless replaceable bladder shall be constructed of heavy duty Butyl and shall be FDA approved for use in potable water systems. Fittings shall be non-ferrous. Tanks shall be factory pre-charged to 40 psig. Acceptable manufacturers: ELBI DTS Series, Wessels TXA Series, or approved equal.

2.13 ELECTRICAL WORK

A. Materials shall be new and shall be Underwriters Laboratories labeled or listed. Wiring shall be contained in metallic raceways. Raceways shall meet the requirements of DIVISION 16 - ELECTRICAL. Wiring for 115 volts and higher shall be copper #12 AWG or larger. Wiring type, insulation, etc. shall meet the requirements of DIVISION 16 - ELECTRICAL. Wiring less than 115 volts shall be copper. Wire size, type and insulation shall be selected to suit the application.
PART 3 - EXECUTION

3.1 UNDERGROUND PIPING

A. Underground piping shall be laid with bell ends pointing upgrade. Pipe shall be graded carefully, bell holes shall be separately excavated and each length of pipe supported firmly and uniformly at the proper elevation and grade. Adjacent lengths of piping shall be adjusted with reference to each other, shimming or wedging between bell and spigot will not be permitted.

3.2 JOINTS

A. Cast iron compression joints - Joints shall have neoprene insert type gasket designed for use with plain end pipe and fittings. Gasket shall be folded and placed into hub so that retaining lip of gasket is properly seated. Approved gasket lubricant shall be applied to inside of gasket only. End of pipe or fitting shall be inserted into gasket and jacked into place using an approved jacking tool or lead maul and wood blocking per manufacturers recommendations.

B. Hubless cast iron joints and cast iron to PVC joints - Joints shall be made using approved connectors as hereinbefore specified. Piping shall be inserted into sleeve until seated, install shield to completely cover sleeve, tighten clamps with torque wrench to specified pressure.

C. Welded underground joints - Before field wrapping and coating of field welded joints the joint shall be thoroughly wire brushed and cleaned of scale, rust and other deleterious substances. Ends of the factory applied coating shall be trimmed back as necessary. Apply one coat of primer as recommended by the manufacturer of the tape being applied. Install two spiral wraps of 10 mil tape with ½" width laps.

D. Threaded and bonded (TAB) joints - Clean ends of piping using joint cleaner (methyl chloride, acetone or methyl ethyl keytone) and paper towels. Clean entire bonding surface to remove oil, grease, mud, fingerprints, etc., do not touch after cleaning. Thoroughly mix adhesive per manufacturers instruction. Apply adhesive to the machined portion of the spigot end of the pipe and ½" past the last thread of the bell end of the pipe or fitting. Screw the pipe together using wrenches suitable for use with fiberglass piping. Check lock-up of joint by moving pipe in a up-and-down or side-to-side motion. If movement of pipe at joint is noted tightened until no movement is noted.

E. Installation of screw jointed, and solder jointed, grooved jointed, and/or welded jointed piping shall be as specified in SECTION 15010 - MECHANICAL GENERAL PROVISIONS.
3.3 VALVE BOXES

A. Valve boxes shall be set flush with finished grade, concrete collar or paved surface. Each valve box shall be set in a precast or poured-in-place 4" thick concrete collar. Collar shall be 12" larger than the outside diameter of the valve box ring.

B. For valves 2½” and smaller, install a suitable length of 8" diameter PVC pipe between pipe and cast iron ring. Plastic pipe shall be notched to fit over the pipe. Valve shall not be deeper than 12” below grade. If the piping system is deeper than 18” below grade, the piping shall be offset to bring the valve within 12" of finished grade.

C. Valves 3" and larger, the adjustable riser portion of the roadway box shall be long enough to allow for the top to be raised an additional 2" inches without replacing the lower section. Provide two T-handle socket wrenches of sufficient length to operate the deepest valve on the project. Obtain a signed receipt from the Owner {} when wrenches are delivered.

3.4 CLEANOUTS AND COVERS

A. Cleanouts shall be of the same size as pipes in which they are installed up to 8" in diameter. Cleanouts shall be installed at the base of each stack and at each change of direction more than 45 degrees. Cleanouts shall be installed not more than 50 feet apart in lines 3" and smaller; 75 feet apart in 4" lines and not more than 100 feet apart in lines 5" and larger. Cleanout plugs shall be within 3" of finished grade or building slab.

B. Covers shall be installed on each cleanout concealed underground and under slabs on fill or grade. Cleanouts outside the building shall have the cover installed flush with the concrete paving or shall be set securely in a precast or reinforced concrete collar 12" larger than the diameter of the cast iron ring flange flush with finished grade. Cleanouts in the floor inside buildings shall have the covers and ring set flush with the finished floor covering. Cleanouts in carpeted areas shall have ring with an additional carpet flange. Cleanouts in walls, chases, or inaccessible ceilings shall have access doors as specified in SECTION 15010 - MECHANICAL GENERAL PROVISIONS.

3.5 WATER HAMMER ARRESTERS

A. Install water hammer arresters on each cold water header serving two or more flush valves and on each hot and cold water header serving four or more fixtures without flush valves. Also, install arresters at each quick closing valve such as, but not limited to, disposers, washing machines, dishwashers, solenoid valves, etc. Care shall be exercised when selecting arresters for high volume water usage equipment. ARRESTERS shall be selected, sized and installed per P.D.I. Standard WH 201. Install access doors
as hereinbefore specified for each arrester installed in inaccessible chases, walls, or ceilings.

3.6 INSULATION

A. Pipe, fittings, valves, etc., shall be insulated as hereinafter specified unless otherwise noted.

B. Piping systems:

1. New domestic water piping, fittings and valves installed inside the building or in an accessible crawl space shall be insulated with pipe insulation as hereinbefore specified. Existing uninsulated domestic water piping, fittings, and valves within the area of work shall also be insulated. Underground domestic hot and tempered water piping, fittings and valves shall be insulated with 3/4"-thick foamed elastomeric slip-on tubular type insulation as hereinbefore specified.

2. Fitting insulation shall be covered with jacket covers. Jacket cover joints shall be fastened using stainless steel tack fasteners, pressure sensitive tape, brushed-on vapor barrier mastic or any approved combination.

3. New horizontal runs of waste and acid waste piping and horizontal runs of storm drainage piping inside the building including the fittings shall be insulated. Existing uninsulated horizontal runs of waste and storm drainage piping and fittings within the area of work shall also be insulated. The bottom of the roof drain body and the vertical pipe between the drain body and the horizontal main shall also be insulated. Piping installed above suspended ceilings shall be wrapped with duct wrap as hereinbefore specified. Exposed piping shall be insulated with split type pipe insulation as hereinbefore specified for water piping. Use oversized insulation on hub and no-hub joints.

4. Floor drains and P-traps receiving air conditioning condensate and electric water cooler waste piping above the lowest floor slab, shall have the waste piping and fittings including the bottom of the floor drain insulated from the floor drain or P-trap to the waste stack.

C. Joints:

1. Fiberglass - Transverse joints in exposed fiberglass insulation shall be secured by self-adhering butt strips. Longitudinal joints in exposed fiberglass insulation shall be secured by self-adhering lap strips which are an integral part of the vapor barrier jacket. Longitudinal joints in concealed fiberglass insulation shall be secured as specified for exposed insulation or may be stapled by using outward
clinching staples. If the self-adhering lap strips do not adhere firmly, the Contractor shall re-secure the defective lap strips by stapling as specified above.

D. Protective covering:

1. Where insulation is exposed to areas of physical abuse or damp and wet areas such as toilet rooms, crawl spaces, kitchens, dishwashing rooms, mechanical, and water heater rooms, etc., exposed insulation up to 6'-0" above the floor shall be covered with a PVC jacket.

3.7 FIXTURES AND TRIM

A. General:

1. Each fixture shall be securely fastened to its supporting device (blocking, carrier, floor, or wall hanger). Each fixture shall be installed level and plumb for proper operation. Space between the finished wall and the top and sides of each fixture shall be caulked with flexible silicone based compound. Water lines serving fixtures shall be securely anchored in wall to prevent undue movement. Adjacent and similar fixtures shall be installed at the same elevation. Edges, tops and sides of fixtures requiring caulking or grout shall have joint finished flush with fixture.

2. Where commercial chair carriers are specified for fixtures, carriers shall be securely and properly bolted to the floor slab using wedge type anchor bolts. Securing carriers to adjacent metal studs for support will not be permitted.

3. Where wall hangers are specified for fixtures being installed on metal stud walls, the Contractor shall, if required by the type of fixture, provide additional bracing to prevent wall from deflecting when 150 lbs. of pressure is applied to front edge of fixture. Where wall hangers are specified for fixtures being installed on masonry walls, the Contractor shall use inserts as required to properly secure hanger.

B. Water Closets:

1. Bowls hung from chair carriers shall have proper washers and nuts installed behind bowl and have the outside acorn nuts torqued to proper tightness. Residential carriers specified for use in wood stud construction may have studs used for support.

2. Floor mounted bowls shall be securely fastened to closet flanges. Base of bowl shall be set in a complete bed of waterproof grout. Annular space
around hole in slab and pipe or closet flange shall also be filled with the waterproof grout. Floor flanges shall be caulked into position.

C. Lavatories and Sinks:

1. Wall hung bowls shall have the chair carrier set screws properly tightened to secure lavatory to carrier arms.

2. Countertop bowls shall be set in a continuous heavy bead of flexible silicone caulking compound and anchoring screws tightened securely.

D. Urinals:

1. Bowls hung from chair carriers shall have proper washers and nuts installed behind the urinal and acorn nuts torqued to proper tightness.

E. Service Sinks:

1. Fixture shall have a wall hanger securely fastened to the blocking in the wall. Trap standard support leg shall be adjusted to bear the weight of the fixture.

F. Mop Basins:

1. Precast terrazzo receptors shall be set in a complete bed of waterproof grout, ¼" minimum thickness.

G. Drains:

1. Floor Drains - Floor drains shall be installed at the low point of the floor unless drain is used as a hub or kitchen drain.

2. Hub Drains - Hub drains shall have the rim of the drain installed above the finished floor for use as an open sight drain

3. Membrane flashing clamp shall be attached to the waterproof membrane furnished under other Divisions.

3.8 SANITARY SYSTEM

A. Sewage piping from soil and waste stacks shall be extended to the outside of the building and connected to the building sewer. The building sewer shall be connected to the Parish sewerage system where indicated on the drawings.
B. Horizontal sanitary piping shall be graded not less than 1/8" per foot unless otherwise noted. See drawings for grading other than specified above. Swing joints shall be installed in sewer systems where piping leaves pile supported slabs. Changes in direction in the sanitary system shall be made by the appropriate use of 45 degree wyes, long or short sweep quarter bends, sixth, eighth, or sixteenth bends, or by a combination of these or equivalent fittings. Single or double sanitary tees and short quarter bends may be used only where the flow is from the horizontal to the vertical. Waste and vent lines shall be provided for each fixture and drain, as scheduled on the drawings.

C. Vent piping shall be connected at a height of not less than 12" above the flood level of the fixture served, and shall be graded to drip back into the soil, waste, or vent stack by gravity. Fixtures not specified to be provided with traps as integral parts of their assembly shall have separate traps. No PVC piping shall be installed in any return air plenum space.

D. Vertical stacks, (stack vents and vent stacks) unless indicated otherwise, shall be extended full size not less than 9" above the roof and shall be placed in position before the roofing is applied. Vents shall be flashed using two piece boot and thimble type flashing with the top of thimble turned down into the cavity of the pipe. Flashing shall be of 2½ pound sheet lead and shall extend 8" from the outside of the boot in all directions. Vertical stacks installed through metal roofs shall have flashing furnished and installed under other Divisions of the Specifications. No vertical stacks shall be installed within 10'-0" of any new or existing air intakes. Offset stacks in ceiling below to comply with this requirement.

3.9 WATER SYSTEM

A. Underground copper water mains shall be installed with a minimum earth cover of 18". Underground plastic water mains shall be installed with a minimum earth cover of 2'-6". Offsets, where indicated on the drawings, shall be installed in water system piping, to compensate for ground subsidence, where piping leaves pile supported slabs. Branch lines from hot and cold water mains shall be provided and connected to fixtures, heaters, hose bibbs and outlets indicated. Shutoff valves shall be provided where shown, specified or noted and on each supply to each fixture not provided with a compression stop or auxiliary shutoff valve.

B. Provide valved make-up and/or quick-fill connections where indicated on the drawings for the chilled, hot and/or condenser water systems. Sizes shall be as indicated. Final connection will be made under SECTION 15600 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS. Provide a pressure reducing valve set at 20 psi on the hot water supply line to each commercial dishwasher and clothes washer.

3.10 WATER HEATERS
A. Waters shall be installed within a drain pan on a concrete pad. Heater shall be positioned so that piping connections are accessible. NEC clearance shall be provided for access to electrical components. Heaters shall have adequate clearance to remove and replace heating devices (electrical elements or gas burners). Space shall be allowed for heaters to be removed and replaced without removing adjacent piping or equipment.

3.11 THERMAL EXPANSION TANK

A. Thermal expansion tank shall be connected into the cold water piping to the water heaters, between the heater inlet and the check valve. When multiple heaters are installed, connection point shall be the common line serving each heater.

3.12 CLEANING AND FLUSHING

A. New water lines shall be cleaned and flushed prior to being placed in use and before final acceptance. Water shall be allowed to flow at full main pressure through fixtures and outlets for a minimum of 15 minutes. Prior to flushing, aerators shall be removed and shall be replaced after flushing.

3.13 DISINFECTION OF POTABLE WATER PIPING

A. New potable water lines shall be disinfected prior to being placed in use and before final acceptance of the project. Disinfection shall be in accordance with the Louisiana State Plumbing Code. New water lines shall not be used until system is tested, disinfected and accepted by the Architect/Engineer and the Division of Health, Louisiana Department of Health and Hospitals.

3.14 PROTECTION OF TUBING

A. Water piping installed through concrete slabs on grade or fill shall be protected by a 0.008 mm thick plastic sleeve, color coded (red for hot, blue for cold) and shall extend from 12" below slab to minimum of 6" above slab. Tubing shall be installed at least 3" clear of any reinforcing steel, conduits, etc. Where copper tubing is installed through holes or notches studs, joists, etc., or through furring strips on hollow masonry walls, an approved steel plate shall be installed on each side of member to protect the tubing from damage by nails, screws, staples, etc.

3.15 TESTS OF PIPING

A. The tests described below shall be made in the presence of the Architect/Engineer and a representative of the authority having jurisdiction, if required.

B. Soil, Waste, Vent, Storm Drainage, Greasy Waste, Oil Laden/Waste Oil, and Acid Waste - Piping shall be tested in sections not less than 10' nor more than 40' in
height. Stacks shall be filled with water to the highest point and allowed to stand for 30 minutes without dropping. A smoke or peppermint test may also be required should leaks not be identified during the pressure test.

C. Water - Piping shall be subjected to a hydrostatic pressure test of 100 psi for one hour with no drop in pressure. Piping systems installed above an existing ceiling system shall be tested with compressed air at 100 psi for one hour.

D. Existing Systems - Where new systems are indicated to be connected to an existing system, the new systems shall be tested and then connected to the existing system. Existing systems (except gas) are not to be subjected to the test pressure. Existing gas piping shall be tested at test pressure and any deficiency shall be identified and submitted in writing to the Architect/Engineer accompanied by a cost estimate to perform the corrective work.

3.16 ELECTRICAL WORK

A. Control or signaling wiring shall not be installed in raceways with power wiring. Wiring and raceways for line voltage interlocking shall be work of this Section. Voltage shall be 115 volts, 1-phase, 60 hertz. Provide transformer where required. Control and signaling wiring and raceways between equipment specified under this Section shall be work of this Section.

B. A source of power may be indicated under DIVISION 16 - ELECTRICAL for activating control devices where power for controls does not originate at the control transformer furnished with the starter or control panel. Work of this Section shall include wiring required for controls from this source. If additional 120 volt power is required it shall be obtained from spare breakers at a location approved by the Architect/Engineer. The cost of installation of raceways, wiring, etc. shall be included as work of this Division. The Contractor shall review electrical drawings prior to bidding.

- END OF SECTION -
SECTION 230500 - HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

A. Work under this Section shall include providing complete and functioning Heating, Ventilating and Air Conditioning (HVAC) systems for the project and appurtenances indicated or necessary.

B. Items specified or required shall be provided for a complete and operating system as described in SECTION 200000 - MECHANICAL GENERAL PROVISIONS.

1.2 ELECTRICAL WORK

A. Electrical work in connection with work of this Section not indicated as work of ELECTRICAL DIVISION, shall be work of this Section.

PART 2 - PRODUCTS

2.1 PIPING

A. Refrigerant tubing, piping and fittings:

   a. Seamless copper air conditioning and refrigerant tube (ACR), ASTM B 280, Type L, hard-drawn; wrot copper solder-joint fittings, ANSI B16.22; joints shall be silver soldered or brazed, AWS A5.8.

2. Condensate drain piping and fittings:

   a. 1" and smaller - Seamless copper water tube, ASTM B 88, Type L, hard-drawn; wrot copper solder-joint fittings, ANSI B16.22; joints shall be soldered using 95-5, ASTM B 32, Grade 95A solder.

   b. 1¼" and larger - Seamless copper drainage tube, ASTM B 306, Type DWV; cast bronze solder-joint fittings, ANSI B16.23; joints shall be soldered using 95-5, ASTM B 32, Grade 95A solder.

2.2 SPECIALTIES

A. Refrigerant Specialties:
1. Filter-Driers:
   a. Provide a liquid line filter-drier for each system with the capacity required to suit the equipment specified and for the refrigerants used.
   b. Acceptable manufacturers: Alco, Henry, Sporlan, or approved equal.

2. Moisture Indicators:
   a. Provide refrigerant liquid line moisture-indicating sight glasses for each system of the size to match the size of the liquid line.
   b. Acceptable manufacturers: Alco, Henry, Sporlan, or approved equal.

2.3 INSULATION

A. Insulation shall have a vapor-barrier jacket or facing complying with NFPA-90A fire and smoke hazard rating as determined by Underwriters Laboratories procedure UL 723, ASTM E 84 and NFPA 255 not to exceed a flame-spread of 25 and smoke-developed of 50. Maximum permeability of jacket shall be 0.02 per ASTM E 96.

B. Accessories such as adhesives, mastics, cements, tapes, etc., shall have the same fire and smoke hazard rating as jacket or facing.

C. Piping Systems:

1. Unless otherwise noted, piping installed inside the building shall be insulated with preformed split-type insulation. Insulation type and thickness shall be in accordance with the following table:

<table>
<thead>
<tr>
<th>Inside the Building</th>
<th>Service</th>
<th>Pipe Size</th>
<th>Insulation Type</th>
<th>Insulation Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Refrigerant Suction and Hot Gas</td>
<td>2 1/2&quot; and smaller</td>
<td>Fiberglass or Closed Cellular</td>
<td>1 1/2&quot; Fiberglass or 3/4&quot; Closed Cellular</td>
</tr>
<tr>
<td></td>
<td>Refrigerant Suction and Hot Gas</td>
<td>3&quot; and larger</td>
<td>Fiberglass or Closed Cellular</td>
<td>2&quot; Fiberglass or 1 1/2&quot; Closed Cellular</td>
</tr>
</tbody>
</table>
Inside the Building

<table>
<thead>
<tr>
<th>Condensate Drain</th>
<th>All</th>
<th>Fiberglass or Closed Cellular</th>
<th>1/2”</th>
</tr>
</thead>
</table>

2. Piping installed outside the building and above grade shall be insulated with fiberglass split type pipe insulation in accordance with the following table:

<table>
<thead>
<tr>
<th>Service</th>
<th>Pipe Size</th>
<th>Insulation Type</th>
<th>Insulation Thickness (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refrigerant Suction and Hot Gas</td>
<td>2 1/2” and smaller</td>
<td>Fiberglass or Closed Cellular</td>
<td>2&quot; Fiberglass or 1&quot; Closed Cellular</td>
</tr>
<tr>
<td>Refrigerant Suction and Hot Gas</td>
<td>3” and larger</td>
<td>Fiberglass or Closed Cellular</td>
<td>2 1/2” Fiberglass or 2” Closed Cellular</td>
</tr>
<tr>
<td>Condensate Drain</td>
<td>All</td>
<td>Fiberglass or Closed Cellular</td>
<td>1/2”</td>
</tr>
</tbody>
</table>

3. Fiberglass Piping Insulation - Pre-formed split-type fiberglass insulation, nominal 3-pound per cubic foot density, white all service jacket, and with thermal conductivity (k factor) of 0.23 at mean temperature of 70°F. Insulate fittings, flanges and valves with factory molded or field mitered sections joined with adhesive and wired in place. Provide vapor seal at fittings with a layer of glass fitting tape embedded between two 1/16” coats of vapor retarder mastic. Fitting tape shall extend over the adjacent pipe insulation and overlap on itself at least 2”.

4. Cellular Glass Piping Insulation - Preformed split-type cellular glass piping insulation, nominal 7.5 pound per cubic foot density, white all service jacket, and with thermal conductivity (k factor) of 0.29 at mean temperature of 75°F. Apply joint sealant at all joints. Insulate fittings, flanges and valves with factory molded sections joined with adhesive and secured with metal bands. Provide vapor seal with vapor retarder or weather barrier reinforced mastic. Insulation shall be Foamglas by Pittsburg Corning, or approved equal.
5. Closed Cellular - Foamed tubular elastomeric insulation. Insulation shall meet the requirements of ASTM C 534, have a flame spread rating of 25 or less and a smoke developed rating of 50 or less per ASTM E 84. Miter fit insulation at fittings and accessories. All seams and splices shall be glued.

6. Calcium Silicate shall be 13.0 pounds-per-cubic-foot density rigid hydrous calcium silicate segmented type insulation. Insulation shall have a maximum “k” factor per ASTM C 533 of 0.52 Btu×in/hr×ft²×°F at 500 °F mean temperature. Insulation shall be asbestos-free.

7. Pipe Insulation Jackets - Provide jackets over insulated piping, fittings, flanges and valves. Jackets shall be in accordance with the following table:

<table>
<thead>
<tr>
<th>Piping Insulation Jackets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Service</strong></td>
</tr>
<tr>
<td>Refrigerant</td>
</tr>
</tbody>
</table>

8. Acceptable manufacturers: Knauf, Owens-Corning, or approved equal.

D. Ductwork:

1. Ductwork indicated to be externally insulated.

   a. External wrap shall be 2" thick, 1 pound-per-cubic-foot density (or 2.2" thick 3/4 pound-per-cubic-foot density) commercial-grade duct wrap. Insulation shall have a maximum “k” factor per ASTM C 518 of 0.29 Btu×in/hr×ft²×°F at 75° F mean temperature. Maximum permeability of facing shall be 0.02 per ASTM E 96. Provide with FSK (foil-scrim-kraft) jacket. [Where external wrap is not concealed, provide paintable white PSK (polypropylene-scrim-kraft) jacket. In lieu of FSK]

   b. Ductwork external rigid board insulation shall be 2" thick, 6 pound density rigid duct board. Provide with FSK (foil-scrim-kraft) jacket.
[Where external insulation board is not concealed, provide paintable white PSK jacket in lieu of FSK.]

c. External duct insulation shall have a vapor-barrier complying with NFPA 90A with fire and smoke hazard rating as determined by Underwriters Laboratories procedure UL 723, ASTM E 84, and NFPA 255 not to exceed a flame spread of 25 and a smoke developed of 50. Maximum permeability of facing shall be 0.02 per ASTM E 96.

2. Fire Rated Duct Insulation:

   a. UL rated 3M Fire Barrier Duct Wrap or equal. The duct wrap shall be a foil encapsulated blanket and shall be installed using multiple staggered layers to provide 2-hour fire rating and to allow zero clearance to combustible materials. Installation shall be in full accordance with the manufacturer’s installation instructions and the products UL listing for the specific application including details and accessories for duct access doors, rated wall penetrations, rated floor penetrations, etc.

3. Duct Lining (Flexible):

   a. Ductwork inside buildings specified to have internal acoustical and thermal lining shall have 1” thick, 1½ pounds-per-cubic-foot density, coated, flexible duct liner. [Where specifically indicated provide 2” thick duct liner.]

   b. Liner shall have a maximum "k" factor per ASTM C 518 of 0.23 Btu×in/hr×ft²×°F at 75 °F.

   c. Liner shall have a coating on the air-side of the lining which shall comply with Underwriters Laboratories procedure UL 723, ASTM E84, and NFPA 255 not to exceed a flame spread of 25 and smoke developed of 50.

   d. Liner surface shall be treated with an EPA registered antimicrobial agent to prevent fungal and bacterial growth. The liner shall conform to ASTM C 1338, G21 and G22. The liner shall have an encapsulant edge coating.

2.4 DUCTWORK

A. General:

   1. Inlet and outlet connections to fan equipment shall be made with flexible fiberglass, nylon cloth a maximum of 10" in length, DuroDyne Excelon, or
equal. The cloth shall be flame retardant and have a maximum flame spread rating of 25 and a maximum smoke developed rating of 50.

2. Joints and seams in duct systems shall be sealed with joint sealant.

3. Ductwork shall be fabricated and installed in accordance with applicable SMACNA standards.

4. Square and rectangular ductwork shall be constructed in accordance with the following table:

<table>
<thead>
<tr>
<th>SQUARE AND RECTANGULAR DUCTWORK</th>
<th>SMACNA Pressure rating (Inches WG)</th>
<th>SMACNA Seal Class</th>
<th>Insulation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Ductwork</td>
<td>2</td>
<td>B</td>
<td>Lined</td>
</tr>
<tr>
<td>Return and Transfer Air Ductwork</td>
<td>-2</td>
<td>C</td>
<td>Lined</td>
</tr>
<tr>
<td>General Exhaust Ductwork</td>
<td>-2</td>
<td>C</td>
<td>None</td>
</tr>
<tr>
<td>Outside Air</td>
<td>-2</td>
<td>C</td>
<td>External</td>
</tr>
</tbody>
</table>

To protect against condensation, provide external duct insulation in addition to duct lining where lined supply air ductwork is installed in a non-air conditioned space.

5. Round and oval ductwork shall be constructed in accordance with the following table:

<table>
<thead>
<tr>
<th>ROUND AND OVAL DUCTWORK</th>
<th>SMACNA Pressure rating (Inches WG)</th>
<th>SMACNA Seal Class</th>
<th>Insulation Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Ductwork</td>
<td>2</td>
<td>B</td>
<td>External</td>
</tr>
<tr>
<td>Return Air Ductwork</td>
<td>-2</td>
<td>C</td>
<td>External</td>
</tr>
<tr>
<td>Outside Air Ductwork</td>
<td>-2</td>
<td>C</td>
<td>External</td>
</tr>
<tr>
<td>General Exhaust Ductwork</td>
<td>-2</td>
<td>C</td>
<td>None</td>
</tr>
</tbody>
</table>
B. Supply, Return, Outside Air and Exhaust Ductwork:

1. Square and Rectangular:

   a. Ductwork shall be constructed from galvanized sheet steel except where stainless steel in indicated. Gauges and construction standard shall be in accordance with "SMACNA HVAC Duct Construction Standards, Metal and Flexible", latest edition.

   b. 90-degree elbows in square and rectangular ductwork shall have single-thickness turning vanes on 1 1/2" centers. Other changes in direction less than 90-degrees shall be made with radius type fittings. **Omit turning vanes in internally lined transfer ductwork.**

   c. Sizes indicated on the drawings are sheet metal sizes. Where applicable, allowance has already been made for the lining.

2. Single Wall Round and Oval:

   a. Except where indicated otherwise, duct and fittings as shown on the drawings shall be unlined, round or oval, spiral wound, manufactured from galvanized sheet steel complying with ASTM A653/653M, A924/A924M. Where indicated, ductwork and fittings shall be stainless steel. Ducts shall have lockseam construction.

   b. Fittings shall be compatible with the duct and provided by the duct manufacturer. Elbows up to 8" in diameter shall be die-formed, elbows 9" and larger shall be segmented. Fitting joints shall be brazed or welded.

   c. Snap-lock ductwork will not be allowed.

   d. Joints between duct and fittings shall be flanged type for exhaust systems and shall be either slip or flanged type for supply.

2.5 EXTERNAL DUCT MEMBRANE

A. Provide Flexclad 400 or Alumagaurd LT all weather self adhering rubberized asphalt membrane over all ductwork installed outdoors. Membrane shall be installed in strict conformance with the manufacturer's installation requirements.

2.6 FLEXIBLE DUCTS

A. Flexible ductwork shall be acoustical type Flexmaster 8M or equal, factory-fabricated, preinsulated assembly rated for a positive working pressure of 10" w.g.
Assembly shall consist of a laminate inner liner encapsulating a high-tensile, spring steel helix wire. A fiberglass blanket with an insulating valve of R=6.0°F-Ft2-Hr/BTU shall cover the inner liner. Increase insulation thickness to provide an insulating valve of R=8.0°F-Ft2-Hr/BTU where flexible ductwork is installed in an non-air conditioned space. The insulation shall be covered with a reinforced metalized jacket. Jacket shall have a perm rating of 0.01 per ASTM E 96-A. The entire assembly shall comply with UL 181, NFPA 90A and 90B as a Class 1 Air Duct Material. Assembly shall also have a flame spread rating of 25 or less and a smoke developed rating of 50 or less. [Where flexible duct is is not concealed, remove the factory insulation and insulate with external duct wrap with paintable white PSK (polypropylene-scrim-kraft) jacket as specified for externally insulated round ductwork. ]

2.7 DUCT FITTINGS

A. Spin-in

1. Each rigid or flexible round duct shall be connected to the square or rectangular sheet metal main or branch ducts using an engineered, galvanized, sheet metal fitting as shown on drawings.

2. Fittings shall be constructed of heavy gauge, galvanized sheet steel with riveted construction. Where duct sizes allow, provide conical-converging type to reduce the pressure-drop through the fitting. Throats of fittings shall be constructed so that positive seals are provided when fittings are installed.

3. The following options shall be provided:

a. Adjustable dampers with positive-locking, damper regulators with handles (delete dampers in VAV systems upstream of VAV boxes).

b. Insulation stand-offs to allow for damper adjustment without damaging insulation.

2.8 DUCT ACCESS DOORS

A. Frame shall be 22-gauge galvanized steel with neoprene gasket seal and "dove tail" edges to attach to ducts. Size of doors shall be as required to service item inside duct.

B. Doors shall be 22-gauge galvanized steel with continuous piano hinge and cam locks. Quantity of locks shall depend on door size.

C. Door shall be insulated with 2" thick, fiberglass insulation compressed to 1". "R" factor shall be 7.7.
D. Access doors installed at fire dampers shall have glass panel insert.

E. Acceptable manufacturers: Air Balance, Karp type KHD, Krueger, Ruskin type ADH-22 or ADHW-22, or approved equal.

2.9 DUCT JOINT SEALANT

A. Indoor Application:

1. Duct and duct mounted equipment installed indoors shall be sealed using a mineral-gypsum impregnated fiber tape and a liquid adhesive. Tape and adhesive shall have a combined UL listing of a flame spread of 10 and a smoke developed of 0. **Omit Sealant on ductwork exposed in finished areas.**

B. Outdoor Application:

1. Ducts and duct mounted equipment installed outdoors shall be sealed using a brush-on industrial grade outdoor water based duct sealant. Sealant shall have a UL listing of a flame spread of 5, and a smoke developed of 0.

2.10 VIBRATION ISOLATION

A. Provide isolators as specified. Where vertical height for installation is limited, modifications to the isolator connection may be required; i.e., custom brackets or supports to allow mounting of isolators to the side of in lieu of directly under equipment. Minimum deflection shall be in accordance with ASHRAE 2015 HVAC Applications Handbook, Page 48.45 for the specific installation conditions. Provide structural rails or structural bases where equipment base is not self supporting.

B. Isolation Type:

1. The following type isolation shall be provided unless specifically indicated otherwise on the drawings:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Handling Units</td>
<td>A</td>
<td>Spring Isolators</td>
</tr>
<tr>
<td>Condensing Units, Fans</td>
<td>C</td>
<td>Isolator Pad</td>
</tr>
<tr>
<td>Piping Systems</td>
<td>D</td>
<td>Spring and Rubber Hanger</td>
</tr>
</tbody>
</table>
2. Type A: Free-standing, unhoused, laterally stable steel springs incorporating leveling bolts and ¼" thick ribbed noise isolation pads. The springs shall have a lateral spring stiffness greater than 0.8 times the rated vertical stiffness, and shall be designed to provide 50 percent overload capacity. In capacities up to 5,000 pounds, springs shall be replaceable. In capacities over 5,000 pounds, springs shall be welded to the top and bottom load plate assemblies.

Acceptable manufacturers: Amber/Booth, Vibration Mounting Series AC, Kinetics Model FDS, or approved equal.

3. Type B: Reinforced concrete inertia bases with spring isolators. The steel members shall be designed and supplied by the isolator manufacturer. Concrete shall be poured into a welded steel frame, incorporating prelocated equipment anchor bolts, ½" diameter reinforcing bars on nominal 8" centers each way, and recessed isolator mounting brackets to reduce the mountain height of the equipment, but yet remain within the confines of the base. The thickness of the base shall be a minimum of 8 percent of the longest span between isolators, at least 6 inches, or as indicated on the drawings. Where inertia bases are used to mount pumps, the bases shall be wide enough to support piping elbows.

Acceptable manufacturers: Amber/Booth, Vibration Mountings Type WPF, Kinetics Model CIB, or approved equal.

4. Type C: Pads shall be individually coated with a flexible moisture impervious elastomeric membrane. Pads shall have a constant natural frequency over the operating load range, and the stiffness shall increase proportionately with load applied. Pads shall be no taller than the shortest horizontal dimension. Where the equipment base does not provide a uniform load surface, steel plates shall be bonded to the top of the pads.

Acceptable manufacturers: Kinetics Model KIP-Q Molded fiberglass, Vibration Mountings - Shear-Flex or Cork-Rib, or approved equal.

5. Type D: Combination spring and fiberglass (or rubber) hangers, incorporating precompressed molded fiberglass (or rubber) noise and vibration isolation pads, coated with a moisture impervious elastomeric membrane in series with springs, each encased in welded steel brackets. Springs shall be as hereinbefore specified. Isolators shall be designed for 50 percent overload capacity, and shall accommodate rod misalignment over a 30-degree arc. Brackets shall be designed to carry 500 percent overload without failure.

Acceptable manufacturers: Amber/Booth Vibrations Mounting Series RSH, Kinetics Model SFH, or approved equal.
2.11 SPLIT SYSTEMS (DX)

A. Provide systems having capacities scheduled on the drawings. Each system shall consist of a high efficiency condensing unit and evaporator/blower with integral factory mounted and wired multiple step electric heater. System components shall be ARI certified and UL listed.

B. Each high efficiency compressor shall be provided with low-friction valve parts, rubbing surfaces, and piston rings. The hermetic compressor shall be protected against adverse weather, abnormal temperatures and high pressures. Units shall have internal pressure relief which resets automatically. Provide internal crankcase heater that operates only when the compressor is off. The compressor shall be internally spring-mounted and the housing shall be externally isolated and enclosed in a separate compartment.

C. Each condenser fan motor shall have permanently lubricated ball bearings.

D. Each condensing unit casing shall have a baked enamel finish which shall protect the casing and base of the unit against rust and corrosion. Rubber grommets shall isolate the refrigerant lines from the casing to eliminate the possibility of noise caused by vibration.

E. The unit manufacturer shall select and provide a replaceable core filter/drier, and a moisture indicating sight glass, for installation in the refrigerant piping.

F. Each evaporator blower shall be direct drive with a multi-speed blower motor.

G. Each direct expansion cooling coil shall have aluminum fins mechanically bonded to copper tubes.

H. The evaporator blower with integral electric heating and DX cooling coils shall have a baked enamel finish to protect the unit casing. Unit shall be provided with 2 sets of throw-away filters.

I. Provide a 5-year parts warranty on compressors.

J. Acceptable manufacturers: Carrier, Trane, York, Daikin, or approved equal.

2.12 DUCTLESS SPLIT SYSTEMS

A. Provide complete ductless splits systems with the features indicated in the contract documents. The systems shall be provided with all equipment, controls, wiring, piping, insulation, accessories and appurtenances for complete and properly operating systems.
B. Provide five year parts warranty on compressors.

c. Acceptable manufacturers: Daikin Industries or approved equal.

2.13 AIR COOLED CONDENSING UNITS

A. Provide condensing units which have capacity as scheduled on the drawings. Each unit shall be enclosed in weatherproof casing, galvanized, bonderized with baked enameled surfaces, with removable access panels, suitable for outdoor installation. Each unit shall be complete with refrigeration compressor, air cooled condenser, fan, factory wired controls and control panel.

B. Each compressor shall be hermetic or semi-hermetic type, mounted on vibration isolators. Air cooled condenser shall have copper tube-aluminum fin or aluminum tube-aluminum fin coil, arranged for vertical up air discharge, condenser fan with discharge air guard, and furnished with ASA B9.1 relief device.

C. Controls shall provide for compressor control by cycling. Unit shall have high and low pressure cut-out, compressor motor and condenser fan motor overloads, nonrecycle relay and crankcase heater.

D. Provide five year parts warranty on compressor.

e. Acceptable manufacturers: Carrier, Trane, York, or approved equal.

2.14 CURBS AND SUPPORTS

A. Prefabricated metal roof curbs shall be provided for roof mounted fans, rooftop air conditioning units, etc.

B. Prefabricated metal roof support rails supporting roof mounted equipment shall be of 18-gauge galvanized steel construction with mitered and welded corner seams, integral base plate and integral cant strips.

C. All roof mounted curbs and supports shall be fully coordinated with the roof type and the roofing manufacturer’s installation details and requirements.

D. Curbs and rails on sloped roofs shall be sloped to suit the roof and installed to the top surface level.

E. All curbs and rails shall be fastened to the building structure to withstand hurricane force winds.
F. All equipment installed outdoors shall be fastened to their curbs, rails, supports and or building structure to withstand hurricane force winds. Provide galvanized or stainless steel straps or cables to anchor roof mounted equipment securely to structure to withstand hurricane force winds.

2.15 FANS

A. Fans shall be of the sizes and types scheduled on the drawings and shall be complete with back draft dampers and accessories scheduled. Fans shall be rated in accordance with AMCA Standards and shall be AMCA labeled. Fractional horsepower motors shall be provided with internal overload protection and disconnecting means.

2.16 DAMPERS

A. Provide fire, smoke and volume dampers at locations indicated on the drawings. Installation of dampers shall be in accordance with the applicable requirements of NFPA-90A and the guidelines of the Sheet Metal and Air Conditioning Contractor's National Association (SMACNA). Fire and smoke dampers shall be UL approved listed and labeled as required. The sizes of the dampers listed on the drawings are approximate sizes. The Contractor shall verify the actual size required by field measurements before final ordering. Where dampers include multiple sections, provide mullions, angles and other supports and accessories for an installation in full conformance with the manufacture's installation instructions for the velocities and static pressures the damper will be subjected to.

B. Fire Dampers:

1. Provide Style B dynamic fire dampers with fusible links listed for 165°F.

2. Dampers shall be classified for dynamic closure to a minimum of 4000 FPM and 4" WG static pressure. Fire dampers shall have the same minimum rating as the partitions in which they are installed, but in no case shall the rating be less than 1½ hours in accordance with UL 555 Standard for Fire Dampers. Dampers shall be rated U.L. leakage Class I.

3. Each fire damper shall be installed within an approved sleeve and secured with mounting angles.

4. Where required due to the application, substitute thinline dampers, multi-blade dampers, dampers specifically designed for installation at grilles, etc., to allow for full conformance with UL installation requirements for fire dampers.

5. Dampers at outside air intake louvers may be static type.
C. Manual Volume Dampers:

1. Damper frames shall be of welded 16-gauge hot rolled galvanized steel construction with integral top and bottom blade stops.

2. Blades shall be constructed of triple-crimped 16-gauge hot rolled galvanized steel. Blades shall be a maximum of 8" wide and shall be of the opposed type, center pivoting and shall have blade edge seals on mating edges.

3. Blade actuators shall be ¼" diameter steel connecting bars attached to alternate blades with 12-gauge blade clips and bronze trunnion pins. Shaft end linkages shall be connected to adjacent blades.

4. Blade shafts shall be ½" diameter with steel stub ends on all but actuator shaft which shall be full length of blades with 6" extension and locking hand quadrants for duct mounting. Bearings shall be nylon type.

5. Dampers larger than 48" in any dimension shall be provide in multiple sections. Finish shall be standard mill finish.

6. Provide insulation stand-offs on externally insulated ductwork so that damper can be adjusted without damaging insulation.

D. Backdraft Dampers:

1. Provide Ruskin Model CBD2 counter-balanced backdraft damper with aluminum blades, vinyl edge seals and adjustable counter weight. Damper must be suitable for both horizontal and vertical installation with airflow in both directions.

E. Acceptable manufacturers: Ruskin, Nailor, Greenheck, or approved equal.

2.17 AIR DISTRIBUTION DEVICES

A. General

1. Ceiling mounted air distribution devices shall be fully compatible with the ceiling type in each area. See architectural drawings and specifications. Ceiling mounted air distribution devices shall be fully compatible with the ceiling type in each area. All lay-in devices installed in narrow (or wide) tee ceilings shall have narrow (or wide) tee design borders. All lay-in devices installed in ceilings with dropped panels shall be dropped panel design.
2. For square or rectangular neck diffusers with round branch ducts, provide a square-to-round galvanized sheetmetal adapter with the round neck size equal to branch duct size indicated. Adapter shall be minimum of 4" deep so as not to reduce the effective area of the diffuser.

3. Provide an air extracting device where supply grilles or supply registers are installed on a branch duct tap.
   a. At each supply register or grille with a rectangular duct tap not exceeding 1'–6", install a Titus Model AG-45 air-extracting device with a #3 key operator and access through face of register/grille.
   b. At each supply register or grille with a rectangular duct tap from 1'–7" long to 3'–0" long and at each ceiling diffuser with a rigid duct tap up to 3'–0" long, install a Titus Model AG-45 air-extracting device with a push-pull wire operator.
   c. At each ceiling diffuser with a rigid duct tap over 3'–0" long and any branch duct tap serving two or more supply air devices, provide a Titus Model AG-45 air-extracting device. Device shall be complete with end bearings, square shaft and a concealed operator in an accessible location.

B. Registers, Grilles and Ceiling Diffusers:

1. Supply Registers (SR) - Titus Model 272; ¾" spacing, airfoil blades, double deflection register with vertical face bars; Model AG-15 opposed blade damper and Model PF surface mount frame. Register, frame and damper shall be aluminum construction with aluminum enamel finish.

2. Ceiling Diffusers (CD) - Titus Model TDC-AA; louvered face square and rectangular ceiling diffuser with square or rectangular neck, with removable 1, 2, 3 or 4 way blow cores with opposed blade dampers. Diffuser and damper shall be aluminum construction with white enamel finish. Face style shall be Type 1 - surface mount.

3. Ceiling Mounted Return Air Grille (RG) - Titus Model 50F; eggcrate grid core with ½" x ½" x 1" grid spacing. Grille shall be aluminum construction with white enamel finish. Frame style shall be Type 1 - surface mount with except for 22x22 and 46x22 sizes installed in lay-in ceilings which shall have lay-in frame.

4. Ceiling Mounted Exhaust Air Grille (EG) - Titus Model 355; ½" spacing, 35 degree fixed deflection. Grille shall be aluminum construction with white enamel finish. Frame style shall be Type 1 - surface mount.
5. Acceptable manufacturers: Titus, Price, or approved equal.

2.18 WALL LOUVERS

A. Exterior

1. Louver shall bear the AMCA Certified Rating Seal. Ratings shall be based on tests and procedures performed in accordance with AMCA 511 and shall comply with the AMCA Certified Ratings Program. AMCA Certified Ratings Seal shall apply to air performance and water penetration ratings.

2. Louver shall be Miami-Dade County Approved.

3. Louver shall be AMCA impact Resistant.

4. Louver shall be 6" deep drainable blade type and shall have extruded aluminum blades and frame not less than 0.081" thick.

5. Louver shall have drain gutter in the head frame and in each blade with downspouts in jambs to drain water from the louver.

6. Provide ½" mesh bird screen constructed of aluminum wire mounted in an aluminum frame secured to the interior louver frame with sheet metal screws. The bird screen shall be removable.

7. Louver shall pass 1000 fpm free area velocity with less than 0.16" of w.g. pressure drop per AMCA Standard 500.

8. Louver shall pass 1000 fpm free area velocity with less than 0.01 oz. of water per square foot of free area per AMCA Standard 500.

9. Louver shall have incorporate structural supports and mullions required to withstand a design wind load of 138 PSF and a test load of 207 PSF.

10. Louver shall have Kynar 500 with finish color selected by the Architect.

11. Acceptable manufacturers: Ruskin ELF6375DXD or approved equal.

2.19 ELECTRICAL WORK

A. Materials shall be new and shall be Underwriters Laboratories labeled or listed.
B. Wiring shall be contained in metallic raceways. Raceways shall meet the requirements of DIVISION 16 - ELECTRICAL.

C. Wiring for 115 volts and higher shall be copper #12 AWG or larger. Wiring type, insulation, etc. shall meet the requirements of DIVISION 16 - ELECTRICAL.

D. Wiring less than 115 volts shall be copper. Wire size, type and insulation shall be selected to suit the application.

PART 3 - EXECUTION

3.1 PIPING

A. General:

1. Per the National Electrical Code, piping shall not be routed over electrical panels or other electrical equipment. National electrical code service clearances shall be maintained for electrical equipment. Coordinate trades.

2. Open ends of piping and fittings shall be plugged or capped upon delivery to the jobsite and shall be stored in a matter that keeps the interior and exterior surfaces clean and dry.

3. Provide caps or plugs in all manual drains and vents.

4. Changes of pipe sizes shall be made by using eccentric pipe reducers only. In pump suction connections the flat part shall be on the top. In all other piping the flat part shall be on the bottom. The use of bushings is prohibited.

5. The piping arrangement shown is a design based on currently available equipment. The plans show typical equipment to scale and show practical arrangement. Modification will be necessary during construction, at no additional cost to the Owner, to adapt the equipment layout and piping plans to the precise equipment purchased by the Contractor. Accessibility for operation and maintenance must be maintained.

6. All piping shall be installed parallel to walls and column centerlines. Fully coordinate work of each trade to provide the designed systems without interference between systems.

7. Valves shall be located and stems oriented to permit proper and easy operation and access to valve bonnet for maintenance of packing, seat and disc. Valve stems shall not be below centerline of pipe.
8. Manufactured fittings only shall be installed on piping 2½" and smaller. Manufactured fittings shall be used on piping systems 3" or larger except "weld-o-lets" or "thread-o-lets" may be used for branch connections if the branch is less than one-half the size of the main. The use of "stab" type connections is prohibited.

9. Piping shall be racked and handled in a manner to prevent the entrance of dirt or foreign matter. Open pipe ends shall be plugged or capped at the end of each working day.

10. Automatic air vents shall be provided at each high point in the system and drain valves shall be provided at each low point. Drain lines from air vents shall be piped to the nearest floor drain or drain pan.

11. Piping shall be installed to permit proper circulating of fluids and to permit drainage. Circulating water piping shall be pitched upward in the direction of flow. Installation of piping shall include accessories as hereinbefore specified, as shown on the drawings or as required for the proper operation of the system.

B. Drain Line Piping:

1. Provide for evaporator coils and air conditioning equipment, a complete drainage system. Lines shall be installed to pitch down in the direction of flow not less than 1 inch in 40 feet, changes in directions shall be made using tees with plugs or caps.

2. Cooling coil drain outlets shall have a deep seal trap. Also provide a deep seal trap at drain connections for air handling system components with a positive or negative static pressure at the drain connection.

3.2 TESTING AND CHARGING REFRIGERANT SYSTEMS

A. The system shall be pressurized with dry nitrogen to 450 psi on the high pressure side and 150 psi on the low pressure side. Each joint shall be leak checked using a soap-water solution; leaks shall be corrected and the system retested as hereinbefore described. When the system proves tight, the pressure shall remain on the system for 24 hours with no drop in pressure. Line pressure and ambient temperature readings shall be taken immediately after the system is determined to be leak-free and again 24 hours later. A correction of 0.3 pounds per square inch will be allowed for each degree change between the initial and final temperature of the ambient air.

3.3 PREPARED OPENINGS
A. Provide a prepared opening for duct penetrations through partitions, walls, and floors.

B. Insulated ducts and piping passing through prepared openings and pipe sleeves shall have a 0.016" aluminum jacket installed over the external insulation. Jacket shall extend a minimum of 2" on either side of the wall. Secure jacket on each end with aluminum draw bands.

C. Where wall is fire and/or smoke rated and the opening is required to be sealed, the annular space between the two metal surfaces shall be packed solid with mineral fiber type fire rated safing insulation.

D. Where ducts and piping are exposed in any area or below a suspended ceiling a sheet metal flange or a chrome plated escutcheon large enough to cover the annular space and sleeve flange shall be installed.

3.4 PIPE JOINTS

Refer to SECTION 15010 - MECHANICAL GENERAL PROVISIONS for installation of any pipe joints.

3.5 INSULATION

A. Piping System:

1. Piping, valves and fittings shall be insulated as indicated on the drawings and specifications.

2. Where insulation is installed between hangers and pipe, install an 18" long section of rigid insulation of similar thickness suitable to support the pipe and its contents at each hanger, saddle, or support location. Insulation type and density shall be selected so that compression does not exceed 1/16".

3. Fitting insulation shall be covered with jacket covers. Jacket cover joints shall be fastened using stainless steel tack fasteners, pressure sensitive tape, brushed-on vapor barrier mastic or any approved combination.

4. Pipe Joints:

a. Fiberglass:

   1) Transverse joints in exposed fiberglass insulation shall be secured by self-adhering butt strips.
2) Longitudinal joints in exposed fiberglass insulation shall be secured by self-adhering lap strips which are an integral part of the vapor barrier jacket.

3) Longitudinal joints in concealed fiberglass insulation shall be secured as specified for exposed insulation or may be stapled by using outward clinching staples.

4) Insulate fittings, flanges valves and piping accessories with factory molded or field mitered sections joined with adhesive and wired in place. Provide vapor seal at fittings with a layer of glass fitting tape embedded between two 1/16" coats of vapor retarder mastic. Fitting tape shall extend over the adjacent pipe insulation and overlap on itself at least 2".

5) If the self-adhering lap strips do not adhere firmly, the Contractor shall resecure the defective lap strips by stapling. Stapling will only be allowed in concealed spaces. Exposed insulation shall be replaced.

b. Cellular Glass:

1) Install cellular glass insulation in strict conformance with the manufacturer’s installation instructions for the specific application.

2) Insulate fittings, flanges valves and piping accessories with factory molded or field mitered sections joined with adhesive and wired in place. Provide vapor seal at fittings with a layer of glass fitting tape embedded between two 1/16" coats of vapor retarder mastic. Fitting tape shall extend over the adjacent pipe insulation and overlap on itself at least 2".

c. Foamed Elastomeric:

1) Where possible, tubular insulation shall be slipped onto the piping prior to joining piping.

2) When installing on already joined piping systems, insulation shall be slit longitudinally, snapped over the pipe and longitudinal and butt joints shall be coated with contact adhesive and glued together.

3) Fittings shall be insulated by mitering and notching insulation. Valves shall be insulated by using oversized insulation.
4) All joints, seams and spices shall be glued.

B. Protective Covering (Piping):

1. Where insulation is exposed on equipment platforms, or in equipment rooms, unconditioned open buildings or in areas of physical abuse, insulation up to 7'-0" above the floor or platform shall be covered with a metal jacket secured with metal bands on 12" centers.

2. Where insulation is installed in a crawl space or is exposed to the weather insulation shall be covered with two layers of 15 pound inorganic roofing felt secured in place with aluminum tie wires in 12" centers. Transverse joints of the felt shall be lapped a minimum of 6". The felt shall be covered with an aluminum jacket, as hereinbefore specified, secured by soft aluminum bands on 12" centers.

3. Where exterior piping is required to be insulated, the first 3 feet of the piping above the ground level shall be insulated with a nonabsorbent (foam-glass) type of insulation. The insulation shall be weatherproof as hereinbefore specified. The transition joint between the two dissimilar insulations shall be sealed to prevent the ground water from entering.

4. Fitting insulation shall be covered with UV stabilized PVC jacket covers. Joints shall be waterproofed.

5. Elastomeric insulation shall be weatherproofed by applying two coats of manufacturer approved paint to the exterior surface of the insulation and providing piping jackets on all straight lengths.

C. Ductwork:

1. Externally insulated ductwork:

   a. Ductboard insulation shall be used for all exposed square and rectangular ductwork which is indicated to be externally insulated. **This includes ductwork exposed in mechanical and electrical rooms.** All ductwork which is not installed above suspended ceilings or is not concealed in furrings or chasses shall be considered exposed.

   b. Ductwrap shall be used for round and oval ductwork and for concealed square and rectangular ductwork which is indicated to be externally insulated.
c. All supply, return and outside air ductwork which is not indicated to be internally lined shall be externally insulated.

2. External Wrap:
   a. Joints and seams in the duct wrap shall be secured by a double row of staggered outward clinching staples on 6" centers. Staples and joints shall then be sealed by applying an approved pressure sensitive foil tape.

3. External Board Insulation:
   a. Board insulation shall be impaled over weld pins or studs and secured with clips, spaced on not more than 16’ centers. At pins or stud locations, apply a 4” x 4” layer of vapor barrier material adhered with vapor barrier adhesive at each pin or stud penetration.
   b. Firmly butt sections of insulation board and cover with glass fiber reinforced vapor barrier tape.

4. Where insulated ducts or equipment connect to lined ducts the insulation shall extend over the lined duct a minimum of 6". For cold ducts the ends of the duct lap shall be sealed to the lined duct with vapor barrier tape and mastic.

D. Duct Lining:

1. Ductwork shall be completely covered with liners. Liner shall be cut to assure overlapped and compressed corner joints. Transverse joints shall be neatly butted and shall have no gaps. The coated surface shall face the air stream.

2. Liner shall be attached to the sheet metal with 100 percent coverage of adhesive and exposed leading edges and transverse joints coated with adhesive. Liner shall additionally be secured using mechanical fasteners installed per SMACNA Duct Liner Application Standard.

3.6 DUCT SYSTEMS

A. Duct systems shall be constructed and installed in accordance with "SMACNA HVAC Duct Construction Standards" latest edition and good engineering practices.

B. Provide externally insulation for supply, return and outside air duct systems which are not indicated to be internally lined.
C. Open ends of ductwork including fittings and accessories shall be capped when stored on the site. Interior and exterior surfaces shall be cleaned just prior to installation. The open ends and open taps of each duct section shall be capped immediately after installation. Also cover grilles, registers and diffusers immediately after installation.

D. Per the National Electrical Code, ductwork shall not be routed over electrical panels or other electrical equipment. National electrical code service clearances shall be maintained for electrical equipment. Coordinate trades.

E. Fire, fire/smoke, and smoke dampers shall be installed in accordance with the manufacturer’s installation instructions and in accordance with the damper UL listing. Provide duct, wall and ceiling access doors at each damper for inspection and service.

F. Interior surfaces of ductwork visible through air distribution devices shall be painted flat black. All items visible through air distribution devices shall also be painted flat black. This includes items like turning vanes, liner pins, dampers and similar items.

G. There shall be no flex ductwork routed through partitions.

3.7 INSULATED FLEXIBLE DUCT

A. Maximum length of flexible duct between main, trunk or branch duct and diffuser shall be 8 feet. For sound attenuation, use full 8’ long flex to diffusers and grilles with a minimum of one 90 degree ell.

B. Maximum length of flexible duct between main, trunk or branch duct and a VAV box shall be 5 feet. For sound attenuation, use 5’ long flex to VAV box inlet connections.

C. Duct shall be supported at intervals not to exceed manufacturers recommended spacing using metal or approved fabric type hangers.

D. Flexible ducts shall not be installed through walls or partitions.

E. Cut duct to required length. Fold back outer vapor barrier jacket and insulation. Slide inner liner over the sheet metal "tap" and tightly secure the liner as follows:

1. High pressure side of equipment (between main, trunk or branch duct and VAV box) - Stainless steel "radiator type" draw bank with helical screw.

2. Low pressure side of equipment (between main, trunk, or branch duct and diffuser and between VAV box and diffusers) - Plastic "wrap-ties".
F. After inner liner is secured, slide insulation and vapor barrier jacket over inner liner and secure with a plastic "wrap-tie". Seal joint between outer jacket and insulation wrap (where required by specifications) with a vapor-proof mastic.

3.8 DUCT ACCESS DOORS

A. Access doors shall be installed adjacent to fire dampers, smoke dampers, duct smoke detectors, electric duct heaters and terminal heating coils.

B. Doors shall be installed in ductwork on the upstream side of the equipment, so that the door can be fully opened and item inside ductwork can be readily serviced.

C. Where required due to space problems, the hinge may be omitted and double cam locks provided.

3.9 DUCT SEALANT

A. Duct sealants shall be used as follows:

1. Gasket type may be used only on flanged joints.

2. Mastics may be used on flanged joints, as a fillet or groove sealant and as a surface sealant between ductwrap and a rigid duct system.

3. Embedded fabric shall be used on all other type joints.

4. Omit Sealant on ductwork exposed in finished areas.

3.10 VIBRATION ISOLATION

A. Install vibration isolators as hereinbefore specified for equipment specified on this project.

B. Specified type isolators shall be installed on each suspended piping system 1" diameter and larger. Piping/tubing systems coming from or going to equipment requiring isolators shall be provided with isolators for a minimum of 50 feet from each piece of equipment.

C. The first 3 hangers from the equipment shall be capable of handling the same deflection as the equipment isolators. Remaining isolators shall provide ¾" deflection.

3.11 EQUIPMENT
A. Floor-mounted mechanical equipment (heat pump units, pumps, boilers, etc.) shall be installed on concrete housekeeping pads.

B. Provide safety pan under equipment containing cooling coils (air handlers, heat pump units, etc.). Provide emergency drain piping to nearest drain.

C. If required due to excess vibration the Contractor shall statically and dynamically balance air handling and ventilating unit fan wheels after the equipment has been installed. Fan wheels must be balanced to within ½ the ARI tolerance levels.

D. The HVAC systems shall not be operated at any time without all filtration in place. Provide clean filters at substantial completion. Temporary filter media shall be installed across return and exhaust grilles and registers if systems are operated prior to occupancy. Temporary filter media shall be merv 8. Prior to starting a unit, the contractor must obtain the owner’s consent that it is acceptable to owner for the contractor to utilize the equipment during the construction phase. The systems shall not be started until the jobsite is thoroughly cleaned. Whenever floors or walls or sanded, the HVAC systems must be de-energized and the areas must be cleaned before the HVAC systems are restarted.

E. Keep interior surfaces of ductwork and air handling equipment clean throughout the construction period. Access doors to air handling units shall not be left in the open position. Inlet and outlets to air handling equipment shall be capped when stored on the site and shall remain capped until ductwork is connected.

3.12 AIR DISTRIBUTION DEVICES

A. Grilles, diffusers, door grilles, etc., shall be adequately secured using only oval-head, countersunk, sheet metal screws or screws specifically provided by the device manufacturer. Finish on head of fastener shall match the finish of the device.

B. Fully coordinate installation and supports for plenums and accessories associated with linear diffusers, flow bars and similar items with the ceiling systems.

C. Support all ductwork, plenums and air distribution system components from the building structure.

D. Where air distribution devices are cut into lay-in ceiling tiles, provide galvanized supports concealed above the ceiling tile so that the weight is transferred to the lay-in support system in lieu of the ceiling tile.

3.13 FLUSHING AND CLEANING

A. Piping, coils, heaters, etc., installed for heating, cooling or other operations of the building shall be thoroughly flushed of debris and foreign objects before any system
is placed in operation. After flushing strainers, traps and dirt legs shall be checked and cleaned.

3.14 TESTS OF PIPING

A. Existing Systems:

1. Where new systems are indicated to be connected to an existing system, the new systems shall be tested and then connected to the existing system. Existing systems (except gas) are not to be subjected to the test pressure.

2. Existing gas piping shall be tested at the specified test pressure for new piping.

B. Protection:

1. In systems in which are installed devices such as valves, gauges, steam traps, etc., having a design pressure less than the test pressure, the device shall be isolated or removed from the system during the pressure test.

3.15 PREPARATION FOR AND ADDITIONAL WORK ASSOCIATED WITH TESTING AND BALANCING OF AIR AND HYDRONIC SYSTEMS

A. Scope of Work:

1. The contractor shall have equipment in operation and shall field verify operation prior to HVAC testing and balancing.

B. Additional Work:

1. Install clean filters as described in other sections of the specifications, prior to the beginning of the testing and balancing work. Temporary filter media for the purpose of protecting permanent filters during balancing may be used.

2. Air Handling Unit total air flows shall be balanced for "dirty" filter conditions. If necessary, provide manual dampers or temporary perforated plates or other approved restriction to simulate these conditions.

3. Debris resulting from or caused by installation of air conditioning and exhaust duct work shall be removed. Suction and discharge plenums shall be clean and made ready before the commencement of the balancing work.
4. Debris resulting from or caused by installation of air conditioning and exhaust duct work shall be removed. Suction and discharge plenums shall be clean and made ready before the commencement of the balancing work.

5. Remove and clean strainers. Operate air vents at the high points of the system to eliminate air.

3.16 TESTING AND BALANCING OF AIR AND HYDRONIC SYSTEMS

A. Scope of Work:

1. The services of a single, independent air balance and testing agency, approved by the Architect, shall be obtained to test, adjust and balance supply, return, exhaust and hydronic systems. The agency shall specialize in the testing and balancing of heating, ventilating, air conditioning and hydronic systems.

B. General Requirements:

1. Testing and balancing shall be performed in complete accordance with the sections applicable to air distribution and hydronic balancing of the Associated Air Balance Council (AABC), National Standard for Field Measurement and Instrumentation latest edition.

2. The testing and balancing firm shall be an Agency whose primary responsibility is testing, adjusting and balancing of heating, ventilating, air conditioning and hydronic systems.

3. Testing and balancing shall not begin until systems have been completed and are in full-working condition. Heating, ventilating, air condition and hydronic equipment shall be put into full operation by the Contractor and shall continue the operation of same during each working day of testing and balancing.

4. The work required herein shall consist of setting air volumes, water flows, and speed adjustments to within 10 percent of design requirements as shown on the drawings or listed in the specifications.

5. A minimum of two visits to the job site, for inspection of duct installation and damper accessibility, pipe installation and flow measurement points are required during construction prior to the installation of the ceilings. Any inconsistencies found or additional balancing dampers or measuring points needed shall be reported to the Architect.
6. The Test-and-Balance Agency shall cooperate with the Architect, Mechanical, Controls and Sheet Metal Sub-contractors, to effect smooth co-ordination of the balancing work with job schedule.

7. Upon the completion of the test and balance work, with test data recorded, the Test-and-Balance Agency shall submit six copies of the completed report to the Architect for his review and evaluation.

8. Prior to review of the balancing of the air conditioning system, the Architect may request that the balancing Contractor perform a "spot check" a selected 10 percent of air outlets in his presence. If the readings do not coincide with the report or within specified tolerances, the system balance shall be rejected and the Test-and-Balance Agency shall be required to rebalance the system. This procedure shall be repeated until the balance of the system is acceptable.

C. Submittals:

1. Copies of a detailed procedure to be followed in the testing and balancing of each air distribution, exhaust and hydronic system being used in this project shall be submitted to the Architect as described in SECTION 15010 - MECHANICAL GENERAL PROVISIONS. An acceptable copy must be returned to the Architect before balancing work is begun.

2. Sample forms to be used in listing information and data shall be submitted.

D. Air Balancing Procedure:

1. Air Handling Unit total air flows shall be balanced for "dirty" filter conditions. If necessary, provide manual dampers or temporary perforated plates or other approved restriction to simulate these conditions.

2. Pitot transverses shall be taken in main ducts to obtain the cfm of each fan.

3. Minimum standards, as listed in the Associated Air Balance Council (AABC) National Standards shall be followed in balancing each system installed on this project.

4. The following items shall be tested, recorded, and incorporated in the test and balance report. The report shall not be limited to these items but shall include these tests as minimum requirements.
a. Record fan numbers, manufacturers, model numbers and serial numbers.

b. Test, adjust and record required and measured total cfm for each fan system.

c. Test, adjust and record any required and measured outside air and return air quantities.

d. Test and record required and measured system static pressures; filter differentials, coil differentials and fan total static pressures.

e. Record any installed fan drive assemblies, fan sheaves, motor sheaves and belts.

f. Record each installed motor manufacturer and each motor horsepower together with nameplate electrical characteristics; i.e., voltage, amperes, hertz and rpm.

g. Test, adjust and record each blower rpm.

h. Test and record any entering and leaving air D.B. temperatures.

i. Test and record any entering and leaving air W.B. temperatures.

j. Test and adjust any supply, return, outside and return air ducts to proper design cfm.

k. Test and adjust the cfm delivery of each diffuser, grille, and register to within 10 percent of design requirements.

l. Identify and record the location of each diffuser, grille and register.

m. Record size, type and manufacturer of each grille, register and diffuser.

n. Data obtained for each diffuser, grille and register shall include required fpm velocity and test resultant velocity, required cfm and test resultant cfm after adjustments.
o. Diffusers, grilles and registers shall be adjusted to minimize drafts.

p. Tests shall be made with supply, return and exhaust systems operating, and doors, windows, etc., closed or in their normal operating condition.

q. Damper positions shall be permanently marked after air balancing is complete.

r. Cooperate with control contractor's representative. Automatically operated dampers shall be set and adjusted to operate as specified or indicated. Testing agency shall check controls for proper operation and calibration.

s. The final balanced condition for each area shall include the testing and adjusting of pressure conditions. Front doors, exits, elevator shafts, etc., shall be checked for air flow so that exterior conditions do not cause excessive abnormal pressure conditions.

3.17 ELECTRICAL WORK

A. Control or signaling wiring shall not be installed in raceways with power wiring. Wiring and raceways for line voltage interlocking shall be work of this Section. Voltage shall be 115 volts, 1-phase, 60 hertz. Provide transformer where required. Control and signaling wiring and raceways between equipment specified under this Section shall be work of this Section.

B. A source of power may be indicated under DIVISION 16 - ELECTRICAL for activating control devices where power for controls does not originate at the control transformer furnished with the starter or control panel. Work of this Section shall include wiring required for controls from this source. If additional 120 volt power is required it shall be obtained from spare breakers at a location approved by the Architect/Engineer. The cost of installation of raceways, wiring, etc. shall be included as work of this Division. The Contractor shall review electrical drawings prior to bidding.

- END OF SECTION -
SECTIO\N 230900 - HEATING, VENTILATING & AIR CONDITIONING CONTROL SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing labor, materials, and equipment indicated, specified, or necessary for complete and operating controls. See 200000 - MECHANICAL GENERAL PROVISIONS which apply to this Section.

A. DESCRIPTION OF SYSTEM

1. The system herein specified shall be a low voltage (12 or 24 volt) electric or electronic type temperature control system. The system shall include required wiring, raceway, engineering, labor and labor supervision.

2. The components shall be as manufactured by Johnson Controls, Invensys, Schneider Electric, Siemens, Honeywell, or equal. To exhibit proven reliability, materials and equipment used shall be standard components, regularly manufactured for this and/or other systems and not custom designed especially for this project. Systems and components shall have been thoroughly tested and proven in actual use.

3. The intent of the specification is to describe through specification paragraphs, the criteria for providing an electric or electronic temperature control system consisting of control devices, control panels, wiring, relays, and other materials and devices required to accomplish the functions and operation described herein.

4. Although such work is not specifically indicated, provide all supplementary or miscellaneous items, software, appurtenances, and devices necessary for a sound, secure, and complete system.

B. QUALIFICATIONS

The control company shall have a 10-year successful history in the design and installation.

C. SHOP DRAWINGS

A complete set of temperature control drawings and a complete sequence of control shall be submitted for approval prior to installation or fabrication of any equipment. The Submittal shall include a Schematic Flow diagram for systems and equipment showing locations of instruments and devices along with a written description of the sequence of
operation for the system or subsystem depicted in the diagram. Submittal shall indicate interconnecting wiring between devices and equipment. Each drawing shall include a Bill of Material showing device number, quantity, and manufacturers' catalog number for devices shown. Submittal data shall include a schedule of devices to be located, including properly sized control valves. Drawings shall include interlock wiring components, motor starters, contactors and numbered terminals on equipment. Submittal shall include a detailed input/output summary and a list of proposed initial setpoints. Refer to SECTION 200000 - MECHANICAL GENERAL PROVISIONS for details.

D. ELECTRICAL WORK

1. Electrical work in connection with work of this Section, and not specified in DIVISION 26 - ELECTRICAL as work of DIVISION 26, shall be done under this Section.

2. Control and power wiring for control devices, including raceways, breakers, disconnects etc. required for a complete and operating control system shall be provided as work of this Section.

3. Pressure taps for static pressure sensors and any other devices installed in air handling systems shall be work of this Section.

E. OPERATION AND TYPE OF SYSTEM

1. General

   a. The sequence of operations as described herein is intended to provide a general description of the operation, functions and capabilities required. Some detailed description of features of the control operation are included for clarity.

   b. To assist in establishing a means by which certain operations can be accomplished as described, the following should be noted:

      1) Interlocks between motors, other devices and equipment may, at the option of the Contractor, be accomplished electrically or electronically.

      2) If differential pressure switches are required to be two-stage type, they may be electric type; or they may be electronic type, actuating one or two relays, as required.

      3) If sequence control is required, an adjustable dead band shall be provided between modes.
4) In each description which follows, where a change of mode is specified, such as, but not limited to, activating or deactivating dampers or coil valves, start-up, or by limit controllers of any sort, the control signal to the controlled devices shall have a means to provide time delay (approximately 60 seconds-adjustable) in the action of the controlled device to prevent hunting. The exception to this is the operation of any device when either a firestat or other safety device is activated. Any exception shall be caused to occur quickly but without damage to the controlled device or equipment.

2. Type of Equipment

   a. Specifications for equipment and devices are covered in PART 2 - PRODUCTS and more detailed features of operation and methods are included on the control diagrams on the drawings.

   b. Any necessary relays, switches, or other devices required to accomplish the operating sequences and functions described shall be provided under this Section, whether or not mentioned herein.

3. Identification

   Any devices associated with a given item of equipment shall be identified as shown in the schedules on the drawings and shall be shown on the shop drawing submittal with a suffix number which identifies it with that equipment.

1.2 TRAINING

   A. The subcontractor shall provide competent instructors to give instructions to the User Agency’s personnel in the operation and maintenance of the system, “as installed” rather than a general training course. Instructors shall be thoroughly familiar with all aspects of the subject matter. All training shall be held during normal working hours of 8:00 A.M. to 5:00 P.M. weekdays.

   B. Provide eight (8) hours of instructional training for User Agency’s operating personnel of up to four (4) operators per class.

PART 2 - PRODUCTS

2.1 CONTROLS AND DEVICES

   A. Devices
1. Space Thermostats for Split Systems - Ecobee EB-ESSi-01 or equal 365-day programmable thermostat with holiday programs, automatic heating/cooling change-over, system heat-off-cool-auto, and fan auto-on switching. Provide clear, key lock thermostat cover for each thermostat. See equipment schedules for number of heating and cooling stages.

2.2 CONTROL DAMPERS

A. Dampers shall be specifically designed to control air flow in heating, ventilating and air conditioning systems. Dampers shall be installed where indicated on the drawings or otherwise specified. Dampers shall be of the low leakage type rated at a maximum leakage of 3 cfm per square foot at 1 inch W.G. Blade type shall be opposed or parallel as required.

B. Frames shall be constructed from 13-gauge galvanized sheet steel, roll formed into channels and welded for maximum strength. Safing strips shall be added to the top, bottom and/or sides to achieve sizes in 2 inch increments.

C. Blades shall be constructed from two roll formed sheets of 22-gauge galvanized sheet steel, spot welded together for extra strength to withstand high velocities and static pressures. Blade pins shall be square zinc plated steel.

D. Bearings shall be oil impregnated sintered bronze. Blade end seals shall be self-compensating stainless steel. Seals shall be easily replaceable if damaged.

E. Stops shall be provided to prevent over rotation at both the open and closed positions. The linkage which interconnects the damper blades shall be housed in the side channels of the frame to reduce air noise and friction.

F. Actuator shall be properly sized to operate the damper and mounted in an accessible location.

G. Provide stand-off brackets for actuators on externally insulated ductwork.

2.3 ELECTRICAL WORK

A. Materials shall be new and shall be Underwriters Laboratories labeled or listed.

B. All wiring (including power and controls) shall be contained in metallic raceways. Raceways shall meet the requirements of DIVISION 26 - ELECTRICAL.

C. Low voltage control wiring above accessible ceiling systems may be plenum rated cabling without raceways, but shall be properly supported in accordance with the
requirements of DIVISION 26 - ELECTRICAL. Wiring in walls or above inaccessible ceilings shall be installed in raceways.

D. Control or signaling wiring shall not be installed in raceways with power wiring.

E. Wiring for 115 volts and higher shall be copper #12 AWG or larger. Wiring type, insulation, etc. shall meet the requirements of DIVISION 26 - ELECTRICAL.

F. Wiring less than 115 volts shall be copper. Wire size, type and insulation shall be selected to suit the application.

G. Wiring and raceways for line voltage interlocking shall be work of this Section. Voltage shall be 115 volts, 1 phase, 60 hertz. Provide transformers where required.

H. Control and signaling wiring and raceways between equipment specified under this Section shall be work of this Section.

I. A source of power may be indicated under DIVISION 26 - ELECTRICAL for activating control devices where power for controls does not originate at the control transformer furnished with a motor starter or control panel. Work of this Section shall include wiring required for controls. If 120 volt power is required, it shall be obtained from spare breakers at a location approved by the Engineer. The cost of installation of raceways, wiring, etc. shall be included as work of this Division.

PART 3 - EXECUTION

3.1 GENERAL

The installation shall include calibration of instruments, drawings, supervision, adjusting, validating and checkout necessary for an operational system.

The entire control system shall be installed by skilled personnel under the direction of experienced engineers, each of whom shall have been properly trained and qualified for this work.

3.2 MOUNTING HEIGHTS

A. Adjustable devices in public areas shall be installed at ADA height. Control devices installed in equipment rooms shall be located at eye level so that it may be visually inspected and adjusted, unless otherwise indicated on the drawings or as required to accomplish the control sequence.

3.3 ELECTRICAL WORK
A. Power for control devices shall be obtained from one of the following sources:

1. A dedicated circuit indicated on the Division 26 drawings for HVAC controls.

2. A step-down transformer with fused primary and fused secondary connected to an equipment power source. The control power source must be intended for control devices associated only with that piece of equipment or system.

B. The entire wiring system shall be color coded throughout. The color code shall be established on the control diagrams using solid colored wire. Where necessary, conductors may be spliced in junction boxes but the splice shall be of the proper size for the class and type of circuits. Insulation shall be type TW, THW, THHN/THWN or TEF to suit the class and type of circuit.

3.4 OPERATOR INSTRUCTION

A. When acceptable performance of the system has been established, the Contractor shall provide a minimum of 8 hours of on-site operator instruction to the User Agency's operating personnel. Operator instruction shall be provided during normal working hours and shall be performed by a competent control system manufacturer.

3.5 INITIAL SETPOINTS AND PROGRAMMING

A. Coordinate with the Owner's representative to establish initial SETPOINTS and scheduling. Implement initial setpoints and scheduling and assist the User Agency in readjusting and reprogramming throughout the warranty period.

3.6 GUARANTEE

Components, parts and assemblies shall be guaranteed against defects in material and workmanship for a period of one year after acceptance.

3.7 SEQUENCE OF OPERATION AND SPECIAL REQUIREMENTS

**Electrical Power for Control Devices**

Some electrical power for controls will be provided under DIVISION 26 at selected locations as indicated on the Division 26 drawings (in dedicated junction boxes). Work of this section shall include wiring required for controls from that source. Where additional 120 volt power is required, it shall be obtained from panel boards at a location approved by the Engineer. The cost of raceways, wiring, etc., shall be included as work of this Division. The Contractor shall review electrical drawings prior to bidding.

Power wiring for dampers shall be work of this division.
Split System Units and associated Condensing Units
The units are split system DX units with electric heat. The air handling unit shall be started and stopped from its space thermostat. Starting the fan shall enable heating and cooling controls. Cooling and heating shall be staged by the space thermostat. See equipment schedules for the number of stages.

Provide a motorized damper in the outside air duct as shown on the plan. The damper shall be interlocked to open whenever the unit is started and shall close whenever the air unit is de-energized.

Provide a water detector in the safety pan below the unit. Interlock the detector to de-energize the unit if water is detected.

Interlock the liquid line solenoid valves in accordance with the equipment manufacturer’s recommendations.

Provide a high limit thermostat (firestat) in the pure return air stream and interlock it to de-energize the fan if return air exceeds 135 degrees.

Ductless Split Systems
The ductless split systems include indoor units and outdoor heat pump units. Space thermostats are indicated in the equipment schedules. Provide field wiring and controls in accordance with the equipment manufactures requirements and recommendations.

The ductless split systems are air-to-air DX source heat pumps..

The ductless split indoor units shall be started and stopped from its 7-day programable space thermostat. The thermostat shall have independent occupied/unoccupied setpoints. Cooling and heating shall be staged by the space thermostat. Change-over from heating mode to cooling mode, and vice versa shall be in strict conformance with the equipment manufacturers recommendations.

Provide programing, field wiring, mounting of devices as well as any and all other work for a fully functional system. Fully coordinate the work with the successful equipment manufacturer before submitting control shop drawings.

Exhaust Fans
The exhaust fans shall be interlocked to start/stop with their respective motion detector, occupancy sensor, or wall switch.

Additional Controls
Provide controls for all HVAC system equipment and components for a complete and fully functional building HVAC system. Where a specific sequence of operation is not specified, provide controls in accordance with good engineering practices similar in type and function of the sequences included herein.
SECTION 260000 - ELECTRICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The general provisions of the contract, including general and special conditions and general requirements, apply to the work specified in ELECTRICAL DIVISION.

B. Separation of ELECTRICAL DIVISION into Sections is for convenience only and is not intended to establish limits of work. Sections are as follows:

- 260000  ELECTRICAL GENERAL PROVISIONS
- 260500  ELECTRICAL BASIC MATERIALS AND METHODS
- 262000  ELECTRICAL SERVICE AND DISTRIBUTION SYSTEMS
- 265000  ELECTRICAL LIGHTING
- 270500  COMMUNICATIONS SYSTEMS
- 283100  FIRE ALARM SYSTEM

1.2 SCOPE

A. The work under this Section includes furnishing and installing wires, conductors, cables, conduit and conduit fittings, wiring devices, junction and outlet boxes, panelboards, circuit breakers, fuses, time switches, safety switches, lighting fixtures, automatic lighting shut-off devices, grounding connections, emergency lighting system, raceways and wiring for voice/data outlets and telephone outlets, fire alarm system, two-way emergency communication system, CATV distribution system, and other equipment specified or necessary for a complete installation. The work also includes making building modifications if necessary to get these items to the locations for installation.

B. Also included in the work is the power wiring for connection of other items indicated on the architectural plans, as well as power wiring for the equipment specified in DIVISION 15 - MECHANICAL.

C. The work shall include removal of existing electrical equipment not being reused. Lighting fixture and lamp disposal shall meet regulatory agency requirements.
1.3 CUTTING AND PATCHING

A. Contractor shall do his work in such a way to avoid cutting where possible. Holes cut shall be patched in a suitable manner and shall be refinished to match the existing finish. Holes cut in exterior walls shall be patched, flashed, and completely waterproofed. Contractor shall patch and/or repair walls, ceilings, and floors where existing equipment is removed.

B. Work of this Division shall include providing information for any required openings to those responsible for concrete slabs and other concrete members.

C. Field cut openings in concrete shall be located to avoid the reinforcing. These areas shall be scanned (x-ray or other suitable method) to obtain locations of reinforcing and other obstructions. Locations shall be subject to approval of those responsible for DIVISION 3 - CONCRETE.

D. No structural members shall be field cut or pierced without the approval of the Architect.

E. Inserts in slabs and beams for fastening work shall be drilled type.

F. Grouting shall be provided around raceway penetrations through concrete floors equal to the fire rating of the floor using non-shrinking waterproof grout to inhibit water from leaking through the floor.

1.4 DRAWINGS

A. Outlets shown on electrical drawings are located approximately only. Refer to architectural drawings for necessary dimensions. Refer to architectural, structural, and mechanical drawings as well as equipment manufacturer's shop drawings and rough-in drawings, and adjust work accordingly to provide a coordinated installation. Contractor shall install fire alarm devices as near as possible to the locations indicated on the drawings but shall move them as necessary to avoid conflicts with existing equipment and to be located sufficiently away from hot objects.

B. Smoke detectors and heat detectors shall be located so that the maximum distance between detectors is 30'-0", and the maximum distance from walls is 15'-0". Smoke detectors shall also be located within 5' of smoke doors held open. Locations shall conform to other restrictions of NFPA 72 to include the requirement that smoke detectors be kept at least 36" away from HVAC grilles. Contractor shall plan for contingencies in connection therewith to include providing additional smoke detectors and heat detectors.

C. Visual signal unit and audiovisual signal unit locations shall be adjusted as necessary to avoid conflicts with other equipment.
D. Visual signal unit and audiovisual signal unit locations shall be adjusted as may be necessary to meet NFPA 72 Paragraphs 18.5.5.4 and 18.5.5.5.

1.5 LAWS AND PERMITS

A. The National Electrical Code (2020) and State, Parish, City and local building codes shall be considered a part of these specifications, and pertinent articles will not be repeated herein. These codes shall establish the minimum acceptable criteria where more stringent requirements have not been defined in these specifications and/or drawings.

B. The Contractor shall apply for permits and pay inspection fees incidental to electrical work.

C. No work shall be concealed until approved by the local inspector and local regulations shall be adhered to.

D. Upon completion, a certificate of approval from the appropriate regulatory agency shall be furnished to the Architect.

E. The minimum elevation for the installation of electrical distribution equipment (both inside and outside of building) shall be the greater of either 36" above curb (36" above crown of the highest adjacent roadway in the absence of a curb) or 12" above the FEMA Base Flood Elevation. Contractor shall obtain this flood elevation from a licensed surveyor and pay the cost associated therewith. Contractor shall provide documentation to the Architect to confirm that this requirement has been met.

1.6 VISITING SITE

The bidder shall visit the site of proposed work so that he may understand the facilities, difficulties, and restrictions attending the execution of the contract. He will be allowed no additional compensation for failure to be so informed.

1.7 INTERRUPTION OF SERVICES

Services in existing building(s) are to be kept in operation at all times, except when specific permission is given to do otherwise. Before any services are interrupted, arrangements shall be made with the occupants to do this work at a time most convenient to them. This procedure may involve working at night, on Saturday or Sunday, or at a special time of the year, with the length of time of the interruption agreed upon in advance. Once any service is interrupted, work to restore the service in the shortest possible time shall be on a continuous basis unless temporary service is provided or approval is obtained from the Owner to do otherwise. Any temporary services required shall be work of this Division. Allowance shall be made in the Contractor's bid for the cost of any overtime work
1.8 GUARANTEE

The Contractor shall guarantee materials and workmanship for one year after final acceptance of entire project unless a longer guarantee is indicated hereinafter for specific equipment.

PART 2 - PRODUCTS

2.1 MATERIAL AND WORKMANSHIP

Equipment and materials shall be new and shall be listed by Underwriters Laboratories, Inc. in categories for which standards have been set by that agency. Whenever two or more of the same product are indicated, they shall be of the same manufacturer. In particular, panelboards shall be of the same manufacturer. Methods of installation shall be in full accord with the latest and best electrical and mechanical engineering practices.

2.2 SUBSTITUTIONS

A. Names of manufacturers or catalog numbers are mentioned herein in order to establish a standard as to design and quality. Other products similar in design and of equal quality may be used if submitted to the Architect and found acceptable by him. Refer to General Conditions and other portions of the specifications for additional information.

B. When the Contractor elects to use an acceptable alternate manufacturer's equipment, the Contractor shall be responsible to coordinate the change with the trades affected. The Contractor shall also pay for any additional work required under this Division as well as any other Division if the alternate equipment is used.

C. Lighting fixture substitutions shall also be similar in appearance, construction and photometrics (photometric information shall be based on independent laboratory reports) to specified lighting fixtures.

D. If required by Architect because of substitutions, the Contractor shall submit for approval ¼” scale working drawings of equipment areas with both plan and section views, as well as samples.

2.3 SUBMITTALS

A. Within 30 days after award of contract, the Contractor shall submit to the Architect for review one PDF copy of descriptive literature or shop drawings for the
following material which he proposes to use. He shall also submit one printed color (hard) copy of this directly to the Electrical Engineer without routing through the Architect:

- Wiring devices and plates.
- Floor boxes.
- Poke-throughs
- Automatic lighting shut-off devices.
- Panelboards.
- Time switches.
- Fuses.
- Safety switches.
- Lighting fixtures.
- Fire alarm system.
- Two-way emergency communication system.
- CATV distribution system.
- Fault current & protective device coordination study.
- Voice/data wiring and raceway system.

B. In addition, the name of the manufacturer of conduit, E.M.T., and conductors to be used shall be submitted for review. Contractor is reminded that 600V conductors shall be rated for wet locations at 90 degrees C.

C. Where applicable, submissions shall include installation drawings and brochures showing locations, methods of anchoring, connections to work of others, wall or ceiling conditions at each particular installation and special floor mounting conditions.

D. Submissions shall be identified with project name, equipment name and number (if assigned a number) same as the name and number indicated on the drawings; shall be properly marked to show model numbers and any accessories being furnished; and shall have the Contractor's stamp showing he has reviewed the submittal and found it to be in accordance with the specifications and drawings. Items of Division 16 to be submitted shall be submitted in one package.

E. Submittals for voice/data wiring and raceway systems (and CATV systems) shall include shop drawings to show the raceway routings, and a riser diagram to show wiring, quantities of terminal blocks, patch panel ports, splitters for CATV, data switch ports, etc. An elevation layout of each rack shall be provided to show all equipment including Contractor-provided equipment and Owner-provided equipment.

F. Fault current and protective device coordination studies shall be submitted with printed color copies of coordination curves.

G. Submittals which do not comply with the above will be returned without review, for resubmittal.

**PART 3 - EXECUTION**

3.1 EXCAVATING/BACKFILLING
A. Provide excavating/backfilling required for the work of this Division. Removal of obstructions, hidden or otherwise, shall be part of this work. Backfill shall be river sand. Backfilling shall be done in two lifts each thoroughly tamped. Surplus earth shall be removed.

B. Before excavating/trenching, locate and stake out existing underground utilities which may be adversely affected by this work. Work shall be performed in a manner to avoid damage to existing utilities. Repair or replace, at no expense to Owner, any utilities damaged by him. Contractor shall also call 1-800-272-3020 per Louisiana Statutes and coordinate installation prior to beginning work.

3.2 RECORD DRAWINGS

At the completion of the work, unless noted otherwise in the General Conditions, mark-up a set of prints in a neat and understandable manner to show significant changes made during construction. Wiring and raceways installed shall be indicated (routings, wire size and quantity) on the record drawings even if not indicated on the contract drawings. Underground raceways and wiring shall be measured and dimensioned from above-grade structures. Copies of panelboard circuit directories shall be included. These prints shall be scanned and a PDF file (on an external electronic drive), as well as one set of prints made from the PDF, shall be provided. Final payment will be withheld until these drawings are furnished to the Engineer. The Contractor shall pay for the reproduction costs.

3.3 OPERATING INSTRUCTIONS

A. Before final acceptance, prepare and deliver to the Architect two bound copies of operating instructions, which shall include:

1. Description of major components of power systems and each special system, including the function of major items.

2. Detailed operating instructions and instructions for making routine minor adjustments.

3. Routine maintenance operations.

4. Manufacturer's catalog data and service instructions and parts list for each piece of operating equipment.

5. Final reviewed submittals (including review comments).

B. Instruct Owner in the care and operation of equipment and provide the services of a competent mechanic for this purpose.
C. Literature shall be substantially bound in a suitable number of volumes so as to permit heavy usage and shall include wiring diagrams, fabrication drawings and other information as may be required.

3.4 MECHANICAL EQUIPMENT

A. Unless indicated otherwise, magnetic starters (including variable speed drives) will be furnished under other Divisions for installation under this Division.

B. Overload elements in starters shall be selected according to actual motor nameplate full load current. Responsibility for this coordination shall lie with the Division under which the particular starter is furnished.

C. Unless indicated otherwise, power disconnect switches and single speed manual starting switches shall be furnished and installed under this Division. Where combination magnetic starters are provided as work of another Division, the associated disconnect switch will be furnished as work of that Division.

D. Where Division 15 schedules indicate that equipment is furnished with a disconnect, the disconnect shall be installed and connected as work of Division 16.

E. Refer to DIVISION 15 - MECHANICAL, and to mechanical drawings for any additional electrical power work required.

3.5 WORK RELATED TO EQUIPMENT NOT FURNISHED AS WORK OF THIS DIVISION

A. Unless specifically indicated otherwise, any required electrical services for and required electrical connections to items shown on the architectural drawings or specified to be furnished in other Divisions of specification or by Owner shall be electrically connected as work of this Division.

B. As work of this Division, Contractor shall assure that the ceiling support requirements for lay-in lighting fixtures (described in execution portion of the Lighting Section) are met. Contractor shall determine which subcontractor is to include funds for this work.

3.6 PAINTING

Painting, including painting of exposed conduit is specified under DIVISION 9 -FINISHES. Damaged surfaces of factory-finished items, however, shall be repaired to the satisfaction of the Architect as the work of this Division.
Protect the equipment, fixtures, and work from damage. Damaged work will be rejected and replaced at the expense of the Contractor. Lighting fixtures, panels and similar equipment shall likewise be protected from damage and from the weather. Provide adequate and proper storage facilities for such items during the progress of the work.

3.8 BUILDING CODE RESTRICTIONS

Contractor shall assure that he does not install electrical equipment including raceways in or through areas restricted by the building codes. These areas include elevator shafts and stairs.

3.9 ELEVATOR

A. Contractor shall provide feeders and disconnect switches (for power and auxiliaries) indicated and connect therefrom to elevator controllers and/or elevator junction boxes. For some elevators, traction type in particular, Contractor shall extend the power circuit to a non-fused disconnect and motor in the shaft.

B. Contractor shall provide a telephone outlet in each elevator equipment room. He shall also provide a telephone cable in 3/4" raceway from elevator controller (connected to traveling cable) to telephone outlet in elevator equipment room. He shall provide an elevator cellular communicator (such as MyLinkLine) in the elevator machine room with telephone cable connections to the telephone outlet(s) to provide emergency telephone cellular service to (each) elevator cab. Multiple communicators shall be provided where necessary, and each shall include 48-hour battery back-up with (2) RJ-11 jacks and shall be elevator code compliant.

C. See Section 16600 for fire alarm provisions associated with elevators.

D. The disconnect switch for elevator car light, car receptacle, car ventilation, or car heating/air conditioning shall have a phenolic nameplate to indicate the location of the supply side over-current protective device. The disconnect switch or circuit breaker for elevator power (in elevator machine room) shall have an auxiliary contact and shall be interfaced with elevator battery lowering system, and lock off feature. Where circuit breakers are used, they shall have adjustable instantaneous trip.

E. Circuit breakers in distribution panelboards serving elevators, including upstream circuit breakers, shall have adjustable electronic trip to ensure selective coordination.

F. Contractor shall coordinate his work with elevator installer and adjust his work as necessary.

3.10 EXISTING WORK
A. Remove existing lighting fixtures from areas affected by new construction and from areas to be relighted. After completion of work in a given area, the Contractor shall reinstall the existing lighting fixtures or install new lighting fixtures as indicated.

B. Where existing ceilings are being removed, provide new supports for raceways, outlets, junction boxes, and other electrical items which are to remain and which depend upon the existing ceiling suspension system for support. The new supports shall be attached to the structure/slab above.

C. Existing outlets not to be reused shall be removed unless directed otherwise. Where outlets are indicated to remain as junction boxes, wall outlets shall be provided with blank device plates of the type hereinafter specified and ceiling outlets shall be provided with covers to match existing surfaces.

D. Where new wall or ceiling finishes are applied, existing equipment and cover plates for wiring devices, junction boxes, telephone outlets and data outlets, etc., shall be removed and reinstalled. Provide extension rings on outlets to remain, where necessary. New cover plates shall also be installed on boxes that do not contain cover plates. Existing outlets, boxes, etc., are not shown on the drawings; bidder shall visit the site to locate these.

E. Existing exposed conduit and other electrical equipment not to be reused shall be removed. Existing conduit not to be reused and located in accessible attic spaces also shall be removed.

F. Existing conduits in good condition (and of the type and size required) may be reused. Existing conductors, wall switches and receptacles which are required to be removed, unless otherwise individually indicated, shall not be reused.

G. Electrical equipment removed and not to be reused shall be stored in one location on the site; any equipment and material which the Owner does not wish to retain shall become the property of the Contractor and shall be removed from the site by him.

H. Where apparent routings of existing raceways are indicated, it is not possible to guarantee that these routings are correct. The Contractor shall allow for contingencies.

I. Where existing raceways are indicated to be reused, it is not possible to guarantee that the existing raceways are in suitable condition to be reused. Before conductors are installed in existing raceways, the raceways shall be cleaned out and a try-plug ¼" smaller than the inside diameter of the raceway pulled through to assure continuity. Raceways which are found to be broken, blocked, and/or defective in any way shall have the defective sections replaced or entirely new raceway provided with routing subject to approval of the Architect. The Contractor shall allow for contingencies in connection therewith.
J. Where outlets to remain are fed from outlets in partitions to be removed, or ceilings and walls to which new finishes are to be applied, the Contractor shall provide such new homeruns or other rerouting as may be required by job conditions to insure service to the outlets to remain.

K. Where existing equipment including wiring and raceways is in conflict with work of this project, Contractor shall rework/reroute/relocate this equipment as necessary.

3.11 UTILITY CONNECTIONS

A. Coordinate connection of utilities (raceways, wiring, etc.) which are work of this contract to existing utilities and utilities installed as work of other contracts. Verify connections points prior to commencing any work. No additional compensation will be allow for conflicts that occur due to the lack of coordination.

- END OF SECTION -
SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing labor, materials and equipment indicated, specified and necessary for a complete and operating electrical system and related systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

PART 2 - PRODUCTS

2.1 CONDUIT AND TUBING

A. Rigid steel conduit and electrical metallic tubing shall be manufactured by Allied, Triangle-PWC, Republic, Wheatland, or approved equal. Conduit shall be threaded heavy-wall hot-dipped galvanized (inside and out) steel conduit. Electrical metallic tubing shall have galvanized exterior and galvanized or equivalent plastic coated interior to protect against corrosion.

B. Rigid aluminum conduit shall be manufactured by New Jersey Aluminum, or VAW of America from 6063-T42 extruded Schedule 40 pipe. The interior surface shall be coated with special approved lubricating liner.

2.2 CONDUCTORS

A. Conductors shall be copper.

B. Branch circuit wiring shall be #12 AWG or larger (as required for the particular equipment to be fed) with flame resistant insulation. Conductors #8 AWG and larger shall be stranded. Insulation on branch circuit conductors shall be type THWN-2 (rated 90 degrees C, dry or wet), unless indicated otherwise or otherwise required by the particular application. Branch circuits connecting motors to variable speed drives shall be #12AWG or larger, listed flexible motor supply cable type RHW-2 or XHHW–2. Thermoplastic insulation shall not be used for variable speed drive branch circuits.

C. Feeds to surface and/or suspended lighting fixtures shall be #12 AWG type THWN-2 or XHHW-2. Wiring through channels of continuous rows shall be #12 AWG and type THWN-2, or XHHW-2. Recessed lighting fixtures shall be fed with #12 AWG type THWN-2 or type XHHW-2 conductors.
D. Feeders shall be of the size as indicated, with type THWN-2 insulation (rated 90 degrees C, dry or wet), unless indicated otherwise.

E. Except as may be otherwise indicated, conductors shall be manufactured by Triangle-PWC, American Insulated Wire, Senator, Royal, Southwire, or approved equal.

F. The electrical system has been designed based on copper conductors.

2.3 OUTLETS

A. All boxes, fittings and supports (including wireways) shall be galvanized steel. However, where these items are located near cooling towers, they shall be stainless steel type.

B. Boxes for concealed wall outlets shall be 4" square by 1½" deep, or larger, with raised device covers. Device covers for 4" square boxes in masonry walls which are not plastered or otherwise finished shall be 1" minimum in depth with straight rectangular openings for dry wall type construction. Covers for boxes in sheetrock or wood walls shall be of the same depth as the sheetrock or wood thickness and shall have straight rectangular openings.

C. Where 4" junction boxes are indicated or installed, they shall be complete with raised device covers as hereinbefore specified. Blank plates shall be as specified for devices.

D. Boxes for concealed ceiling outlets shall be 4" octagonal by 1½" deep, or larger. Boxes in plaster ceilings shall have plaster covers. Fixture outlet boxes shall be equipped with fixture studs secured to the boxes. Boxes above lay-in ceilings shall be supported by bar hangers or other suitable means; they shall not be supported by ceiling tiles.

E. Concrete boxes shall be used for fixtures on concrete ceilings.

F. Outlet boxes for exposed work at dry locations in Mechanical and Electrical rooms (where exposed raceways are installed) shall be 4" square x 1½" deep or larger with Appleton ½" deep raised surface metal covers to accommodate the devices indicated. For other exposed work at dry locations inside buildings, Bell boxes of similar capacity shall be used, unless surface metal raceway system is specified for these areas. Outlet boxes for exposed work that is exposed to weather or in damp locations shall be of cast or malleable iron, similar to Crouse-Hinds type FS or FD condulets. Boxes shall have metal covers to accommodate the devices indicated.

G. Where floor boxes are required for combination receptacle and voice/data outlets (and additional rough-in as indicated on drawings where applicable), Legrand
Wiremold RFB4 series shall be provided with one recessed duplex receptacle and two data jacks (see Section 16600 for jack requirements). Box shall have one full-sized hinged cover to be provided with floor insert. Edges of boxes shall be installed flush with the finished floor. Carpet flanges shall be provided for locations where carpet is indicated on architectural plans. Exact location of each floor box shall be confirmed with Architect.

H. Poke-through's shall be flush mounted, 2-hour UL listed fire rating for 4" core hole, 3-piece flush type with brass plate, and universal hinged cover, Hubbell series S1 series or equal. It shall be complete with a duplex receptacle and two voice/data jacks and properly sized openings for audiovisual system cables. Edges shall be installed flush with the finished floor. Carpet flanges shall be provided for locations where carpet is indicated on architectural plans. It shall include accessories as necessary. Exact location of each poke-thru shall be confirmed with Architect.

I. In walls or ceilings of concrete, tile, or other noncombustible material, boxes and fittings shall be so installed that the front edge of the box or fitting will not set back of the finished surface more than ¼". In walls or ceilings constructed of wood or other combustible material, outlet boxes and fittings shall be set flush with the finished surface. If a fixture canopy or pan is used as an outlet box cover, any combustible wall or ceiling finish between the edge of the canopy and the outlet box shall be covered with noncombustible material.

J. For conduits 1" and smaller, the following shall be the maximum number of conductors permitted in a box:

<table>
<thead>
<tr>
<th>Trade Size</th>
<th>Max. No. #12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2&quot; x 4&quot; octagonal</td>
<td>6</td>
</tr>
<tr>
<td>1-1/2&quot; x 4&quot; square</td>
<td>9</td>
</tr>
<tr>
<td>1-1/2&quot; x 4-11/16&quot; square</td>
<td>12</td>
</tr>
<tr>
<td>2-1/8&quot; x 4--11/16&quot; square</td>
<td>16</td>
</tr>
<tr>
<td>2-3/4&quot; x 3&quot; x 2&quot;</td>
<td>6</td>
</tr>
<tr>
<td>3-1/2&quot; x 3&quot; x 2&quot;</td>
<td>8</td>
</tr>
</tbody>
</table>

K. Where a fixture stud is installed in box, the number of conductors permitted shall be reduced by one. Where a wiring device is installed in box, the number of conductors permitted shall be reduced by two. A conductor running through the box is counted as one conductor, and each conductor terminating in box is counted as one conductor.

L. Outlet boxes installed flush mounted in stud partitions shall be installed in such a way that boxes between any two studs shall penetrate only one wall face. Outlet boxes that penetrate opposite wall face shall not both be located between adjacent studs so as to reduce noise transmission through walls. Where this cannot be accomplished
and boxes must penetrate opposite wall face and be located between adjacent studs, putty pads (such as those manufactured by Sound Isolation Company) shall be used.

M. Outlet boxes, junction boxes, wireways, etc. used for fire alarm systems shall have permanent legible marking to identify these systems per NEC 760.30.

2.4 WIRING DEVICES

A. Wiring devices shall be white in color and shall be manufactured by P&S/Sierra, Hubbell, Leviton, or Eagle. Comparable catalog numbers of devices furnished shall conform with the following:

1. Duplex receptacles 20A/2 pole, 3-wire, 125 volt, grounding type, -- Hubbell #HBL5362. Face shall be nylon or polycarbonate.

2. GFI duplex receptacles 20A/2 pole, 3-wire, 125 volt, GFI, tamper-resistant, weather-resistant, grounding type, -- Hubbell #GFR5362-ITR. These shall be used for weatherproof applications, and damp locations. Unless noted otherwise, GFI receptacles shall not be used to control downstream receptacles.

3. Wall switches 20A/1 pole -- Hubbell #HBL1221, or equal.

4. Wall switches 20A, 3-way -- Hubbell #HBL1223, or equal.

B. See drawings for specific requirements regarding receptacles that are connected to a dedicated circuit.

C. All 20A/2 pole, 3-wire receptacles shall be mounted with a "U" shaped grounding connection at the top, except for weatherproof receptacles, and except for locations where existing receptacles are mounted with "U" shaped grounding connection at the bottom.

D. Where duplex receptacles are indicated to be located as required for electric water coolers and electronic faucets at sinks/lavatories, they shall be located where indicated on electric water cooler shop drawings and faucet shop drawings. Receptacles for these shall be GFI type. Where electric water coolers are hard wire type, a 20A, 1P toggle switch shall be provided behind the wall access panel in lieu of the receptacle from which concealed wiring in raceway is wired to unit; a dedicated circuit (for one or more of these) shall be provided using a GFI circuit breaker.

E. Where receptacles are located in wet or damp locations, they shall be weather-resistant type to meet NEC 406.9.

F. All dimmer switches shall be of the same manufacturer, unless indicated
otherwise. They shall not be ganged together or with switches where heat ratings will be exceeded.

G. Switches shall have visible labeling to indicate whether they are in the open (off) or closed (on) position.

H. Unless indicated otherwise, lighting fixtures within each room shall be switched by the wall switch or switches indicated in the room.

2.5 DEVICE PLATES

A. Plates shall be of the one-piece type, P&S/Sierra "S-1 N" line or Slater"SSA" line with #302 (non-magnetic) satin stainless steel finish.

B. See drawings for specific requirements regarding device plates associated with receptacles that are connected to a dedicated circuit.

C. Where weatherproof switches are indicated, P&S/Sierra type 302 series WP plates shall be used, unless indicated otherwise on drawings.

D. Where weatherproof receptacles are indicated, metal canopy-type weatherproof covers similar to T&B Red Dot Code-Keeper (UL listed for wet locations at all times) shall be used with the weather-resistant receptacles, unless indicated otherwise on drawings.

E. Use multi-gang plates where switches, receptacles, and/or other devices are grouped.

F. Plates shall be installed with the four edges in continuous contact with finished wall surfaces without the use of mats or similar devices. Plaster fillings will not be permitted. Plates shall be installed with an alignment tolerance of 1/16" from the vertical or horizontal.

G. Plates for devices fed with exposed conduit shall be as hereinbefore specified.

H. Wherever a series of switches and switches are grouped, the plates shall be furnished with suitable factory engravings (black filled). Where engraving of dimmer switch plates is impractical, engraved phenolic strips may be installed. Engravings shall indicate function/location names not subscript shown on drawings (names shall be approved by Architect).

I. Device plates shall not be installed until painting is completed. Device plates having paint on their surfaces, or having their finish marred by use of paint remover, shall
be replaced at no additional cost to the Owner.

2.6 TIME SWITCHES

   A. Time switches shall be Tork #7000-ZL Series, astrodial with skip-a-day and reserve power, 277 or 120/240 volt as required, 40 amps, independent 120 volt clock motor circuit and indoor surface enclosure. Mount switches over flush outlets so that raceways will be concealed. Time switches for mechanically held contactors shall be single pole, double throw; other types shall be double pole, single throw, unless noted otherwise on drawings. Provide 120V branch circuit for clock motor. Phenolic nameplate (white with black cut letters) shall be provided to indicate function of time switch.

2.7 SAFETY SWITCHES

   A. Safety switches shall be of the quick-make, quick-break visible blade-knife switch type. They shall be of the fused or nonfused type as required. Fused switches shall have positive pressure fuse clips. Heavy duty switches shall be fully interlocked, with provision to neutralize the interlock by a screw driver while under load without interrupting the circuit. Switches shall be complete with insulated base, and pressure or solderless lugs (suitable for use with 75 degrees C conductors). Handles shall be front or side operated. Switches shall be horsepower rated, capable of breaking stalled-rotor motor current at these ratings. Unless noted otherwise, outdoor locations shall have NEMA type 3R enclosures; indoor locations shall have NEMA 1 enclosures. Switches shall have provision for padlocking in the "off" position. 600 ampere or smaller switches shall be complete with rejection feature to ensure rejection of fuses other than Class R. Safety switches shall be Square D General Duty type for 208-240 volt non-fused switches and Heavy Duty type for 480 volt switches and 208-240 volt fused switches. Equal equipment as manufactured by GE, Siemens or Cutler Hammer will be acceptable.

   B. Nonfused disconnect switches for single phase motors may be Hubbell #HBL1221I, 20A/1P horsepower rated (for 115V motors) or #HBL1222I, 20A/2P horsepower rated (for 208-240 motors) as required; in outdoor locations these switches shall be mounted in FS condulets with #DS 185 covers and gaskets.

2.8 FUSES

   Provide one complete set of fuses, together with 33% spares, for each fuseholder. Fuses 600A and below shall be Buss Low-Peak, Littlefuse LL, or Ferraz Shawmut Amptrap 2000, Type RK-1, current limiting and time delay, rejection type, unless noted otherwise. Fuses above 600A shall be Bussman LCL, Littlefuse KLP-C or Shawmut Amptrap, UL listed Class L, current limiting and time delay, with 200,000 amp rms interrupting rating, silver plated contact surfaces. Where fuses are used with magnetic starters, fuses shall be reduced in ampere rating (from the sizes indicated) to the maximum rating allowed for each particular starter, as stated on starter nameplate. All fuses shall be of a single
2.9 AUTOMATIC LIGHTING SHUT-OFF DEVICES

A. Ceiling mounted automatic lighting shut-off devices shall be Watt Stopper LMDC-100 series or equal, ceiling mounted, low-profile, with selectable passive infrared detection technology and 360 degree active ultrasonic detection technology, and selectable “initial” and “maintained” settings. Passive ultrasonic sensors that listen for audible sounds are not acceptable.

B. Wall-mounted automatic lighting shutoff devices shall be Watt Stopper DW-311 series or equal, with selectable passive infrared detection technology and active ultrasonic detection technology, with selectable “initial” and “maintained” settings. Device shall have up and down buttons for 0-10V dimming control of fixtures. Passive ultrasonic sensors that listen for audible sounds are not acceptable.

C. On/off control stations shall be Watt Stopper LMSW-10x or equal, wall-mounted, with quantity of buttons as required for control of associated lighting fixture zones to be switched and with LED indicators.

D. Color of devices and associated device plates shall match that specified for wiring devices.

E. Dimmer control stations shall be Watt Stopper LMDM-101-W or equal, wall-mounted with on/off/raise/lower toggle push button and with LED array in bezel to indicate dimming level of associated zone of lighting fixtures.

F. Scene control stations shall be Watt Stopper LMSW-105 series or equal, wall-mounted with on/off/raise/lower toggle push button and four programmable scene selector push buttons, with LED indicators. Program each scene to suit Owner’s requirements.

G. Each dimmer lighting control station and multi-button scene wall switch input shall contain a custom engraving (Watt Stopper LMSW-KIT-10x series or equal) to indicate function controlled. Exact engraving designation shall be as directed by Architect and included in the submittal.

H. Provide on/off room controllers (Watt Stopper LMRC-10x series or equal) and on/off/dimming controllers (Watt Stopper LMRC-21x series or equal) as required for control of lighting fixture zones in associated room/area. Provide wiring in raceway as required to interconnect automatic lighting shut-off device(s), master lighting on/off control stations, dimmer lighting control stations, room controllers, dimming controllers, lighting fixtures, etc. for a complete and properly operating lighting control system within each space to be provided.
I. Provide a digital wireless configuration tool (Watt Stopper LMCT-100 series or equal) to the Owner at the completion of the project. Each digital wireless configuration tool shall be capable of enabling system and device modifications via pushbutton control through two-way infrared communication.

J. Where automatic lighting shut-off devices control lighting fixtures, the automatic lighting shut-off system shall be compatible with the voltage of the lighting fixtures. Where automatic lighting shut-off devices control lighting contactors, the automatic lighting shut-off system shall utilize same control voltage as lighting contactor coil.

K. Lighting fixtures in a room/area shall be turned on by the associated control station(s) in the room/area. Automatic lighting shutoff devices shall have a programmable time delay before automatically turning off the lighting fixtures upon no sensing of occupants. This setting shall be a minimum of 30 minutes unless otherwise directed by the Owner.

L. Where an automatic lighting shut-off system is to control a fan, automatic lighting shut-off device (and associated power supplies/relay packs) shall be horsepower rated as required.

M. Automatic lighting shut-off devices with ultrasonic detection technology shall be mounted no closer than 6'-0" from HVAC supply registers. Generally, automatic lighting shut-off devices shall not be mounted in areas with high volume of air flow.

N. Contractor shall furnish and install complete automatic lighting shut-off systems including wiring and raceways, and all other equipment, whether specifically indicated or not, to provide complete and operating systems. Submittal shall be provided to show locations of components, (recommended by the manufacturer of the particular system), wiring, and operation.

O. During submittal preparation, manufacturer shall determine the appropriate sensing technology for both 'initial occupancy' and 'maintain occupancy' for its location and application and make alterations as necessary. Care shall be taken when selecting the sensing technology when detecting occupants in rooms which contain windows, partitions, aisles, etc. These settings shall be indicated in the submittal. A factory-trained technician shall make adjustments to the sensors on the jobsite for proper performance. In addition, a factory-trained technician shall visit the project 3 months after substantial completion to review operation of these devices, review operation with Owner, and make adjustments. He shall also do this at 6 months, 9 months, and 1 year after substantial completion.

2.10 WARNING SIGNS
A. Standard industry "DANGER HIGH VOLTAGE" warning signs shall be provided as required by the National Electric Code and on other equipment (such as safety switches, time switches, etc.) containing energized components which are exposed when door is opened or access panel is removed.

B. A warning sign shall be provided on panelboards to warn of potential electric arc flash hazards.

C. A warning sign "WARNING -- PARTS OF THE CONTROL PANEL ARE NOT DE-ENERGIZED BY THIS SWITCH" shall be provided on or adjacent to each elevator disconnect switch.

D. A permanent sign (white phenolic to show black letters) shall be provided on panelboards with stinger leg to indicate “Caution ___ phase has ___ volts to ground.

PART 3 - EXECUTION

3.1 METHODS OF WIRING

A. Systems shall be 4-wire, 3-phase, 120/208 volts, A.C.; 4-wire, 3-phase, 120/240 volts, A.C.; 3-wire, 1-phase, 120/240 volts, A.C.; 3-wire, 3-phase, 240 volts, A.C.

B. Provide power wiring as required whether indicated on drawings or not. Homerun raceways to panelboards shall be provided for wiring and shall be limited to the following combinations (which shall also include equipment grounding conductor):

1. One 1-pole circuit (hot and neutral conductors).

2. Two 1-pole circuits (2 hot conductors and 2 neutral conductors), if derated per NEC table 310.15(B)(3)(a).

3. Three 1-pole circuits (3 hot conductors and 3 neutral conductors), if derated per NEC table 310.15(B)(3)(a).

4. One 2-pole circuit (2 hot conductors).

5. One 2-pole circuit (2 hot conductors and one neutral conductor).

6. One 3-pole circuit (3 hot conductors and one neutral conductor).

Where wiring sizes are not indicated on the drawings, the Contractor shall install #12 AWG or larger wiring as required for the ampacity of the particular equipment to be fed. These sizes shall be increased in size (to reduce voltage drop) for the following:
7. 120/208 wiring from panelboard to center of load with length (single conductor length) greater than 50'.

8. 277/480 wiring from panelboard to center of load with length (single conductor length) greater than 100'.

Additional increases in wire sizes shall be made as required to avoid excessive voltage drops. In particular, #8 conductors shall be used for 20A branch circuits with single conductor length (to center of load) greater than 100'.

C. Where a neutral conductor is required for a branch circuit, it shall be dedicated to that branch circuit and shall not be shared by other branch circuits.

D. All wiring run underground or in fill beneath slab shall be contained in rigid threaded heavy wall hot-dipped galvanized (inside and out) steel conduit encased in a 3" minimum thickness concrete envelope. Conduits and concrete envelopes under structural slabs shall be adequately supported from the slab using 3/8" diameter stainless steel rods properly spaced (not greater than 5'-0" spacing between rods) to support the load and to suitably distribute the load within the capacity of the structural slab. The rods shall pass under conduit and rise on both sides to tie into slab. Where multiple runs of conduits are installed, 2" minimum spacing shall be maintained between conduits.

E. Unless otherwise indicated on drawings or specified hereinafter, wiring installed outdoors (not underground or in fill beneath slab and under building) shall be contained in rigid threaded heavy wall galvanized steel conduit (hot dipped, inside and out).

F. Unless otherwise indicated on drawings or specified hereinafter, other wiring shall be contained in electric metallic tubing.

G. Unless specifically indicated otherwise on the drawings, aluminum conduit may be used in lieu of steel conduit, provided same does not run underground or in concrete. Where aluminum conduit is used, fittings, outlet boxes, junction boxes, and accessories shall be aluminum.

H. All raceways shall be concealed unless otherwise indicated.

I. Branch circuit raceways feeding outlets in masonry walls shall be concealed in the masonry. Where outlet boxes are indicated in bare masonry walls, the box shall be mounted so that two edges of the box or plaster cover will fall in a mortar joint. Where switch boxes will not accommodate the number of conductors required and 4" square or larger boxes are installed, provide device covers 1" minimum in depth with straight rectangular openings for dry-wall type construction. Where grouting is required to fill up improperly cut openings in the masonry, the work will be rejected. The work of this section shall be coordinated with the masonry work to insure a neat and workmanlike job.
J. Solderless spring type connectors similar to Scotchlok connectors, Ideal colored Wingnuts, or Ideal Crimps with Wrapcaps shall be used for branch circuit wiring and fixture splice connections. Solderless connectors of the split-bolt type shall be used for splices on conductors #8 and larger.

K. Splices in low voltage wiring (50 volts and less) shall be made at terminal blocks furnished with the equipment. At junctions or where other splices are required, these splices shall be soldered or made with approved compression connectors.

L. Termination of branch circuit and feeder conductors shall be made using mechanical or compression lugs, unless noted otherwise. Where lugs are not furnished with equipment (including Owner-furnished equipment), Contractor shall provide lugs, and/or replace lugs with appropriate size, as required for a complete installation. Also, where conductors are to be connected to equipment furnished with lugs not sized for the conductors, Contractor shall change the lugs to the appropriate size.

M. Termination of low voltage wiring (50 volts and less) and control/monitor/instrumentation wiring (120 volts and less) shall be made using compression type (ring or spade) terminals similar to T&B Sta-Kons.

N. Connections to motors (not equipped with a portable cord) shall be made with a short piece of steel flexible metal conduit between rigid conduit system and motor terminal box. Where the motor is located inside a vibrating housing, connection between housing and motor terminal box shall be made with a short piece of steel flexible metal conduit, and connection between rigid conduit system and housing shall be with a short piece of steel flexible metal conduit. Ground bond of separate copper conductor shall be made between motor frame and rigid conduit system. In outdoor locations and other locations subject to moisture or water leakage (including fire pumps), liquid-tight flexible metal conduit shall be used. Wiring within these flexible metal conduits shall be stranded. “Short piece of flexible metal conduit” is defined as the shortest piece that will provide proper vibration isolation.

O. Taps in feed-thru panelboards and/or wireways and junction boxes shall be made with clear-taps, or OZ gutter taps, complete with bakelite covers.

P. Recessed LED troffers shall be wired with #12 AWG type THWN-2, or XHHW-2 conductors in 4 to 6 feet of ½" flexible metal conduit from a box at least 1 foot from the fixture. Recessed downlights (incandescent, compact fluorescent, LED, and H.I.D.) shall be wired with conductors as heretofore specified in 4 to 6 feet of flexible metal conduit from a box at least 1 foot from the fixture, unless the fixture is of the pre-wired type with an integral outlet box approved for the number and type of branch circuit conductors indicated and/or specified. Not more than two individual fixtures shall be connected to any of these outlet boxes. This box shall be located above the ceiling and shall be accessible.
from attic, by removing acoustical tile in accessible ceiling or by removing fixture in a non-accessible ceiling. Installing blank covers on ceilings to provide access to such boxes will not be acceptable.

Q. Typewritten directory of circuits shall be provided for each panelboard to include spares and spaces. The room numbers and items served shall be indicated for each circuit. (Circuit numbers indicated on the drawings are shown for the purpose of clarifying the grouping of outlets. The actual number assigned to the circuits in the panelboard shall suit the bussing and branch circuiting to panelboard.) In existing panelboards, the directories shall be corrected as required for changes made to the circuits. Phenolic nameplates (white with black-cut letters) shall be provided in lieu of directories for changes to panelboards without doors.

R. Branch circuit wiring through lighting fixtures shall be in accordance with Articles 410.11, 410.31, 410.32, and 410.33 of the National Electrical Code; however, conductor types shall be as specified hereinbefore.

S. Unless a larger size is indicated or required by code or manufacturer, raceways shall be sized in accordance with Table 1 for the number and conductor size (AWG and MCM) shown or specified. Where combination of secondary (0-600 volt) conductor sizes are indicated, the raceway shall be sized in accordance with Table 2 based on the insulated conductor areas of Table 3, for the project conductor sizes (AWG and MCM) indicated even though the actual diameters and areas of the conductors to be installed may differ from those in Table 3.
Table 1

<table>
<thead>
<tr>
<th></th>
<th>1/2</th>
<th>3/4</th>
<th>1</th>
<th>1 1/4</th>
<th>1 1/2</th>
<th>2</th>
<th>2 1/2</th>
<th>3</th>
<th>3 1/2</th>
<th>4</th>
<th>4 1/2</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduit Trade Size (Inches)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conductor Size AWG, MCM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>18</td>
<td>25</td>
<td>41</td>
<td>58</td>
<td>90</td>
<td>121</td>
<td>155</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td>15</td>
<td>21</td>
<td>35</td>
<td>50</td>
<td>77</td>
<td>103</td>
<td>132</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>13</td>
<td>18</td>
<td>29</td>
<td>41</td>
<td>64</td>
<td>80</td>
<td>110</td>
<td>138</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>16</td>
<td>22</td>
<td>35</td>
<td>47</td>
<td>60</td>
<td>75</td>
<td>94</td>
<td>137</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>25</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>00</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>8</td>
<td>11</td>
<td>14</td>
<td>18</td>
<td>22</td>
<td>28</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>000</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>12</td>
<td>15</td>
<td>19</td>
<td>28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0000</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>13</td>
<td>16</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td>13</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>11</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>350</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>9</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>700</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>750</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2

Dimensions and Percent Area of Conduit and of Tubing

<table>
<thead>
<tr>
<th>Trade Size</th>
<th>Internal Diameter Inches</th>
<th>Area – Square Inches</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Not Lead Covered</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total 100%</td>
<td>2 Cond. 31%</td>
<td>Over 2 Cond. 40%</td>
<td>1 Cond. 53%</td>
<td>1 Cond. 55%</td>
<td>2 Cond. 30%</td>
<td>3 Cond. 40%</td>
<td>4 Cond. 38%</td>
<td>Over 4 Cond. 35%</td>
<td></td>
</tr>
<tr>
<td>1/2</td>
<td>.622</td>
<td>.30</td>
<td>.09</td>
<td>.12</td>
<td>.16</td>
<td>.17</td>
<td>.09</td>
<td>.12</td>
<td>.11</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>3/4</td>
<td>.824</td>
<td>.53</td>
<td>.16</td>
<td>.21</td>
<td>.28</td>
<td>.29</td>
<td>.16</td>
<td>.21</td>
<td>.20</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1.049</td>
<td>.86</td>
<td>.27</td>
<td>.34</td>
<td>.46</td>
<td>.47</td>
<td>.26</td>
<td>.34</td>
<td>.33</td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td>1 1/4</td>
<td>1.380</td>
<td>1.50</td>
<td>.47</td>
<td>.60</td>
<td>.80</td>
<td>.83</td>
<td>.45</td>
<td>.60</td>
<td>.57</td>
<td>.53</td>
<td></td>
</tr>
<tr>
<td>1 1/2</td>
<td>1.610</td>
<td>2.04</td>
<td>.63</td>
<td>.82</td>
<td>1.08</td>
<td>1.12</td>
<td>.61</td>
<td>.82</td>
<td>.78</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2.067</td>
<td>3.36</td>
<td>1.04</td>
<td>1.34</td>
<td>1.78</td>
<td>1.85</td>
<td>1.01</td>
<td>1.34</td>
<td>1.28</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>2 1/2</td>
<td>2.469</td>
<td>4.79</td>
<td>1.48</td>
<td>1.92</td>
<td>2.54</td>
<td>2.63</td>
<td>1.44</td>
<td>1.92</td>
<td>1.82</td>
<td>1.68</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3.068</td>
<td>7.38</td>
<td>2.29</td>
<td>2.95</td>
<td>3.91</td>
<td>4.06</td>
<td>2.21</td>
<td>2.95</td>
<td>2.80</td>
<td>2.58</td>
<td></td>
</tr>
<tr>
<td>3 1/2</td>
<td>3.548</td>
<td>9.90</td>
<td>3.07</td>
<td>3.96</td>
<td>5.25</td>
<td>5.44</td>
<td>2.97</td>
<td>3.96</td>
<td>3.76</td>
<td>3.47</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4.026</td>
<td>12.72</td>
<td>3.94</td>
<td>5.09</td>
<td>6.74</td>
<td>7.00</td>
<td>3.82</td>
<td>5.09</td>
<td>4.83</td>
<td>4.45</td>
<td></td>
</tr>
<tr>
<td>4 1/2</td>
<td>4.506</td>
<td>15.94</td>
<td>4.94</td>
<td>6.38</td>
<td>8.45</td>
<td>8.77</td>
<td>4.76</td>
<td>6.38</td>
<td>6.06</td>
<td>5.56</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5.047</td>
<td>20.00</td>
<td>6.20</td>
<td>8.00</td>
<td>10.60</td>
<td>11.00</td>
<td>6.00</td>
<td>8.00</td>
<td>7.60</td>
<td>7.00</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6.065</td>
<td>28.89</td>
<td>8.96</td>
<td>11.56</td>
<td>15.31</td>
<td>15.89</td>
<td>8.67</td>
<td>11.56</td>
<td>10.98</td>
<td>10.11</td>
<td></td>
</tr>
</tbody>
</table>
Table 3

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Col. 1</td>
<td>Col. 2</td>
<td>Col. 3</td>
</tr>
<tr>
<td>18</td>
<td>.146</td>
<td>.0167</td>
</tr>
<tr>
<td>16</td>
<td>.158</td>
<td>.0196</td>
</tr>
<tr>
<td>14</td>
<td>.204</td>
<td>.0327</td>
</tr>
<tr>
<td>12</td>
<td>.221</td>
<td>.0384</td>
</tr>
<tr>
<td>10</td>
<td>.242</td>
<td>.0460</td>
</tr>
<tr>
<td>8</td>
<td>.328</td>
<td>.0854</td>
</tr>
<tr>
<td>6</td>
<td>.397</td>
<td>.1238</td>
</tr>
<tr>
<td>4</td>
<td>.452</td>
<td>.1605</td>
</tr>
<tr>
<td>3</td>
<td>.481</td>
<td>.1817</td>
</tr>
<tr>
<td>2</td>
<td>.513</td>
<td>.2067</td>
</tr>
<tr>
<td>1</td>
<td>.588</td>
<td>.2715</td>
</tr>
<tr>
<td>0</td>
<td>.629</td>
<td>.3107</td>
</tr>
<tr>
<td>00</td>
<td>.675</td>
<td>.3578</td>
</tr>
<tr>
<td>000</td>
<td>.727</td>
<td>.4151</td>
</tr>
<tr>
<td>0000</td>
<td>.785</td>
<td>.4840</td>
</tr>
<tr>
<td>250</td>
<td>.868</td>
<td>.5917</td>
</tr>
<tr>
<td>300</td>
<td>.933</td>
<td>.6837</td>
</tr>
<tr>
<td>350</td>
<td>.985</td>
<td>.7620</td>
</tr>
<tr>
<td>400</td>
<td>1.032</td>
<td>.8365</td>
</tr>
<tr>
<td>500</td>
<td>1.119</td>
<td>.9834</td>
</tr>
<tr>
<td>600</td>
<td>1.233</td>
<td>1.1940</td>
</tr>
<tr>
<td>700</td>
<td>1.304</td>
<td>1.3355</td>
</tr>
<tr>
<td>750</td>
<td>1.339</td>
<td>1.4082</td>
</tr>
<tr>
<td>800</td>
<td>1.372</td>
<td>1.4784</td>
</tr>
<tr>
<td>900</td>
<td>1.435</td>
<td>1.6173</td>
</tr>
<tr>
<td>1000</td>
<td>1.494</td>
<td>1.7531</td>
</tr>
<tr>
<td>1250</td>
<td>1.676</td>
<td>2.2064</td>
</tr>
<tr>
<td>1500</td>
<td>1.801</td>
<td>2.5475</td>
</tr>
<tr>
<td>1750</td>
<td>1.916</td>
<td>2.8895</td>
</tr>
<tr>
<td>2000</td>
<td>2.021</td>
<td>3.2079</td>
</tr>
</tbody>
</table>
T. However, unless a larger size is indicated or required by code or manufacturer, raceway for communication wiring (defined by NEC Chapter 8) shall be sized as a minimum per Table 1 in NEC Chapter 9.

U. Approved thread lubricant containing powdered zinc or lubricating graphite shall be applied to the male threads only of aluminum conduit to prevent joint seizure.

V. Other routings than those indicated may not be used without the approval of the Architect, but the Contractor shall make allowance for possible obstruction to routes indicated.

W. Certain areas and hollow spaces between suspended ceilings and slabs above are being used for environmental air and electrical work therein shall be in accordance with Article 300.22 of the National Electrical Code and the Jefferson Parish building code.

X. Raceways shall be supported in accordance with the National Electrical Code for the particular type of raceway; however, for rigid metal conduit and electrical metallic tubing, the maximum spacing between supports shall not exceed ten feet.

Y. Wall switches indicated by doors shall be located on the strike side (lock side), 6” maximum from door frame to the side of the outlet box; however, for double doors switches shall be located where shown, usually clear of the door in the full open position.

Z. The Contractor shall install additional boxes or fittings in raceways as required to properly install conductors. The locations of these boxes or fittings shall be subject to the Architect’s approval.

AA. In multi-section panelboards, circuit breakers, fusible switches, and spaces shall be divided equally between sections (unless indicated otherwise). The circuit arrangement on panelboard schedules is used only to convey circuit assignment, not locations of circuit breakers in panelboard.

BB. Where a maximum fuse (or circuit breaker) rating is indicated on the nameplates of the magnetic starters, control panels, contactors, etc. (or equipment containing these components) for the specific mechanical equipment, the Contractor shall reduce ampere rating of fuses (or circuit breaker) to be installed (from the sizes indicated). These ratings shall also be increased as necessary to comply with NEC Paragraph 430.52 (C)(1), Exception 2.

CC. Suitable waterproof cable identification tags shall be installed on each power feeder in each pull (junction) box.

DD. Where conductors without raceway penetrate smoke partitions and/or fire
rated partitions and floors, a conduit sleeve shall be installed rigidly in the penetration so that the conductors can pass through it. A UL listed fire-stop putty such as Nelson Flameseal shall be installed around the sleeve and inside the sleeve after the conductors are installed.

EE. Where roof penetrations are required for conduits supplying roof-mounted HVAC equipment, these penetrations shall be of the piping roof curb type per National Roofing Association standards.

FF. Where electrical work penetrates or is installed in fire and/or smoke partitions, this work shall be installed per UL standards. A U.L. listed fire-stop putty such as Nelson Flameseal shall be installed around raceway penetrations.

GG. A branch circuit neutral conductor shall be installed to each lighting switch outlet box, and if not connected, it shall be terminated with a wire nut. This requirement also applies to wall-mounted occupancy sensors. This conductor is not shown on drawings.

HH. Where a safety switch, toggle switch, etc. is to be used as a Code-required in-sight disconnect switch for an item of equipment, Contractor shall obtain dimensional data of the associated equipment prior to rough-in and the location of the disconnect switch shall be adjusted as necessary so that the switch is readily accessible after equipment is installed.

3.2 WIRING IN CONDUIT (APPLIES ALSO TO E.M.T.)

A. Where several conduits (concealed and/or exposed) are run parallel to each other, they shall be grouped together on galvanized P-1 000 Unistrut, with suitable clamps, which shall be attached to the wall or hung from the roof or structural ceiling. Where exposed conduit is indicated, the conduit shall be installed parallel with or at right angles to the building walls and/or ceiling (roof) and shall be supported adequately by pipe straps or other approved devices. Where a single conduit is run exposed in a damp and/or wet location, standoff straps of the type which permit a ¼" air space between the conduit and the wall shall be used. Fastening of conduit shall be as follows: to wood by means of screws; to masonry by means of threaded metal inserts, metal expansion screws, or toggle bolts; and to steel by means of machine straps, bolts, or power actuated fasteners. Raceway fasteners shall be approved for the purpose (tie wire, zip-ties, ty-raps shall not be used).

B. Conduits which must cross building expansion joints shall, where practicable, cross same in furred ceilings areas rather than in slabs or walls, arranged with sufficient flexibility to accommodate the building expansion. However, where such routing is not possible, galvanized expansion fittings shall be provided in each raceway attached to the structure whenever the raceway crosses an expansion joint. Expansion fitting shall be
installed on one side of the joint with its sliding sleeve end flush with the joint and with a
length of bonding jumper in the expansion joint equal to at least three times the normal
width of the joint. Each expansion fitting shall be zinc-coated steel and contain heavy
factory installed packing and internal copper braid packing and shall be complete with UL
approved bonding jumper.

C. Underground runs of multiple conduits shall be provided with plastic
separators to insure 2” minimum of concrete between adjacent conduits.

D. Unless noted otherwise on drawings, underground runs of conduits shall be
installed in concrete envelope of 3” minimum thickness at top, bottom, and sides, so that
the top of the concrete envelope shall not be less than 42” below grade for conductors
operated over 600V and not less than 24” below grade for 600V or less except that under
roads and pavements the minimum for 600V or less shall be 30” below grade. In
non-concreted areas, encasement around conduit stub-ups shall extend to a location just
above grade, and top shall be sloped to drain.

E. Concrete and reinforcing shall conform to DIVISION 3, CONCRETE. Concrete
strength shall be 3000 psi unless noted otherwise on drawings. Concrete shall be colored red for underground conduit applications with an approved admixture.

F. Conduits shall be kept at least 6” from runs of hot water piping, flues, or other
hot object.

G. Where conduit fittings are installed, these shall be Crouse-Hinds or Appleton
cast type.

H. Connectors and couplings for electric metallic tubing shall be of the steel
compression type. Couplings for rigid heavy wall conduit shall be of the threaded type;
two locknuts and one bushing shall be provided where heavy wall conduits enter boxes
or equipment. Flexible metal conduit connectors shall be of the squeeze type with
screw and locknut. Liquid-tight connectors shall be steel compression type.

I. Insulated bushings shall be provided for conductors #4 and larger.

J. No wiring shall be installed in raceways until the raceway system is
complete. Only approved type pulling lubricant shall be used.

K. During construction, outlet boxes and conduit stub-ups shall be suitably
protected against the entrance of foreign materials.

L. Conduit in suspended ceilings shall be located, where practicable, in the
space between the ceiling and the concrete slab above. Raceways shall not be installed
immediately above accessible acoustical ceiling (restricting tile removal) without written
approval of Architect for the specific location. Raceways shall also not be installed in such a manner to restrict or block access to plenums, equipment, etc.

M. Tie-wires shall not be used for support of raceways. Raceways shall be supported by threaded rods, strut, building structure, etc. that secure the raceways (to prevent both vertical and horizontal movement) in addition to supporting them.

N. Where concrete joist construction is employed, arrange with those responsible for DIVISION 3 - CONCRETE to provide in contact ceilings and in unfinished ceilings such headers as may be required to receive boxes for fixtures.

O. Where raceways pierce walls of HVAC housings, these penetrations shall be made per requirements of the HVAC housing manufacturer.

P. Where underground raceways stub up on exterior of building, the Contractor shall install two support rods to keep raceways from sinking relative to building. These support rods shall be 3/8" stainless steel, and shall extend concealed through the concrete encasement and tie into the concrete slab of the building.

Q. Raceways shall not be installed within 24” of mechanical equipment located above ceilings, except for those raceways that serve these units. Raceways shall be located to allow maintenance personnel to remove ceiling tiles below these spaces to service this equipment.

R. Where flexible metal conduit or liquid-tight flexible metal conduit is installed, it shall be securely fastened within 12” of connection point, and additional supports shall be provided per NEC 348 & 350.

S. Where conduits are installed on roofs, unless indicated otherwise, they shall be installed on supports consisting of rubberized base with galvanized strut (B-Line Dura-Blok series DB or Caddy Pyramid series ST fixed strut supports).

T. Where installed under metal-corrugated sheet roof decking, cables, raceways, and boxes shall be installed and supported so there is no less than 1 1/2" between the lowest surface of roof decking and the top of the cable, raceway, or box.

3.3 GROUNDING

A. The metallic raceway system and the neutral conductor of the wiring system shall be grounded at the service equipment. The insulated copper service grounding electrode conductor shall be extended with no splices in raceway from the service to within 5 feet of the point of entrance of the metal underground water service pipe that is electrically continuous and is in direct contact with the earth for at least 10 feet per NEC 250.68(C). It shall also be extended without splice to building structure steel frame.
Where the raceway routing is via finished areas, it shall be run concealed. Ground connection shall be visible, and connection of raceway and conductor to the water pipe shall be made with an approved ground connector similar to T & B conduit hub and water pipe clamp. Also, see Article 250.50, Grounding Electrode System and Grounding Electrode Conductor of the National Electrical Code for bonding requirements to other items to form the grounding electrode system (this includes bonding to metal frame of building and to a concrete-encased electrode to be located near the service equipment).

B. The above requirements shall be supplemented by grounding to ¾" diameter by 10' long copper clad ground rods, and to an encased electrode (consisting of a 20' minimum length of 4/0 B.C. cast in a grade beam or similar concrete-encased foundation member below the vapor barrier, or in a concrete-encased conduit bank that is in contact with earth.

C. Where a grounding electrode conductor exits a metal raceway, (conduit or EMT), T&B or equal rigid threaded conduit grounding hub/clamp fitting shall be used.

D. Grounding bushings with bonding jumpers shall be used around concentric or eccentric knockouts on equipment and on raceways stubbed up below open-bottom equipment such as pad-mounted transformers and panelboards.

E. For service equipment, including service-entrance panelboards and switchboards, bonding shall be done per NEC 250.92. As a minimum, ground bushings with bonding jumpers (sized per Table 250.66) or myers hubs shall be used for this.

F. Grounding pole of each polarized receptacle (non-isolated ground type) shall be bonded to its outlet box with conductor sized in accordance with Table 250.122 of the National Electrical Code and a machine or self-tapping screw, unless the receptacle is of the approved self-grounding type.

G. Each branch circuit and feeder shall be provided with a ground conductor installed with the circuit conductors. Each ground conductor shall be a green insulated copper conductor, with minimum size in accordance with Table 250.122 of the National Electrical Code NFPA-70. These grounding conductors are not shown on the drawings.

H. A ¾" diameter by 10' long copper clad ground rod shall be installed at service pole, and the raceways installed vertically up the service pole shall be bonded thereto with #2 B.C.

I. Where water pipe grounding connection is made underground, a suitable plastic pipe sleeve and flush metal cover shall be installed to provide access to the connection.

J. Where ground connections are made in walls or inaccessible ceilings, access
panels shall be installed. Access panels in walls shall be stainless steel.

K. See drawings for additional grounding requirements.

3.4 MOUNTING HEIGHTS

A. If not otherwise indicated, mounting heights to centerline of outlets shall be as follows:

1. Receptacles -- 18" above floor.
2. Switches -- 48" above floor.
3. Panelboards – not more than 5'6" from topmost operating handle to floor.
4. Wall-mounted fixtures -- 7'0" above floor or, where mounted above exterior door.
5. Exit lights -- at a height just sufficient to clear the swing of the door, unless noted otherwise.
6. Fire alarm pull stations -- 48" above floor.
7. Fire alarm visual units and audio/visual units -- see Section 16600.
8. Voice/data outlets -- 18" above floor.
9. TV outlets -- height as directed.

B. The above mounting heights may be adjusted as required to permit bottom or top of plate to align with mortar joints in unfinished masonry walls, provided joints are not raked. Where joints are raked, adjust height as required to insure that center of outlet box will be in the center of masonry unit. Where outlets at different levels are shown adjacent, they shall, where possible, be installed on a common vertical centerline. Where these adjustments are made, 18" shall be the minimum mounting height for receptacles, telephone outlets, and computer outlets, and 48" shall be the maximum mounting height for switches.

3.5 MARKING OF STARTERS, SAFETY SWITCHES, AND PANELBOARDS

A. Each surface manual starting switch out of sight of the motor which it controls, and each panelboard, enclosed circuit breaker, magnetic starter, safety switch, and toggle switch used as an in-sight disconnect for any equipment regardless of location,
shall be suitably identified by means of ¼" high letters cut in white laminated phenolic strips to show black letters. Strips shall be attached to cover by means of two screws. Device plate for each flush manual starting switch and wall switch used as starting switch or safety switch shall be suitably engraved to identify the equipment controlled.

B. A phenolic nameplate shall be provided on panelboards to indicate the upstream device (panelboard, etc.) where the power originates (e.g. "Panel ____ (fed from Panel ____)").

- END OF SECTION -
SECTION 262000 - ELECTRICAL SERVICE AND DISTRIBUTION SYSTEM

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing labor, materials, and equipment indicated, specified, and necessary for a complete and operating distribution system and related systems, in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500, ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

1.3 EQUIPMENT LOCKS

Panelboards, cabinets, and other electrical equipment having doors with locks, shall be keyed alike. Keys (one set for each electrical equipment item containing locks) shall be provided to the Owner.

1.4 SERVICE EQUIPMENT

Safety switches, panelboards, and switchboards used as service equipment shall be Underwriters Laboratories listed and labeled for the application. Barrier shall be included in these switchboards and panelboards (including load centers) per NEC 408.3(A)(2). A phenolic nameplate (white with black-cut letters) shall be provided on service equipment to indicate "available fault current is ____KA" and date that "calculation was made on ____".

1.5 CIRCUIT BREAKER ARRANGEMENT

In multi-section panelboards, circuit breakers, fusible switches, and spaces shall be divided equally between sections (unless indicated otherwise). In general, each section of multi-section panelboards shall have the same quantity of pole capacity (i.e. two sections with 36 poles in each rather than one section with 42 poles and one section with 30 poles). The circuit arrangement on panelboard schedules is used only to convey circuit assignment, not locations of circuit breakers in panelboard.

1.6 CIRCUIT DIRECTORIES FOR PANELBOARDS/SWITCHBOARDS
Type-written circuit directories shall clearly indicate the associated room as well as the load and location of the load (e.g., Classroom 101 - Lighting Fixtures, Storage 102 - Receptacle on Northwest Wall, Mechanical 103 - Heat Trace on South Wall, etc.).

1.7 JOB NAMEPLATE

An 8" x 5" white micarta job nameplate with black-cut letters (minimum 3/16" high) as directed shall be provided on Panel MDP; it shall include name of Architects, name of Engineers, name of Contractor, and year. Submittal shall include a full-size representation of this for review.

1.8 PANELBOARD CONFIGURATION

Panelboard configurations shall be altered (bus ratings, heights, etc.) as necessary to suit specified panelboard options (feed through lugs, surge protection devices, etc.).

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKER LIGHTING BRANCH CIRCUIT PANELBOARDS (120/240V)

A. Unless noted otherwise boxes shall be approximately 20" wide by 5¾" deep with 5" minimum side and end gutters. Boxes shall be constructed of code gauge galvanized steel.

B. Fronts shall be for flush or surface mounting as indicated and shall be complete with door and flush chrome-plated combination cylinder lock and catch. Fronts shall be full finish code gauge steel with prime coat and finish coat of baked enamel in manufacturer's standard color, with concealed adjustable trim clamps and circuit directory with transparent covers. Door shall have concealed hinges.

C. Bussing shall be copper, and lugs or main breaker, and branch circuit breakers shall have ampere ratings indicated. Breakers shall be connected to the bus in a sequence phase arrangement using full size breakers (double module breakers shall not be used).

D. Two-pole and three-pole breakers shall have common trip. Branch circuit breakers shall be of the bolted type, quick-make, quick-break, thermal magnetic, 10,000 amp minimum interrupting capacity at 250 volts a.c. Trip position shall be between the "on" and "off" positions to positively identify faulted or overloaded circuits from "off" circuits. Where specifically indicated, breakers shall be complete with ground fault circuit interrupter. 15A and 20A one-pole breakers shall be approved for switching duty. Where used to switch H.I.D. lighting, circuit breakers shall be rated (calibrated) to properly carry...
the inrush current (labeled "HID"). Where used to switch fluorescent lighting, they shall be labeled "SWD" or "HID".

E. Panelboards shall be Square D type NQ, or equal, factory assembled. Equal equipment as manufactured by GE, Cutler Hammer, or Siemens will be acceptable.

2.2 CIRCUIT BREAKER DISTRIBUTION PANELBOARDS

A. Boxes shall be not more than 42" wide by 9½" deep and shall be constructed of code gauge galvanized steel. Ample UL approved wiring gutters shall be provided, and no gutter shall be less than 4" wide. Fronts shall be for flush or surface mounting as indicated and shall be complete with door and chrome-plated combination cylinder lock and catch, with locks keyed alike. Fronts shall be full finish code gauge steel with prime coat and finish coat of baked enamel in manufacturer's standard color, with indicating type adjustable trim clamps and circuit directory with transparent covers. Doors shall have flush hinges. However, when panelboards are NEMA 3R, a phenolic nameplate (white with black-cut letters) shall be provided for each circuit breaker to identify the load in lieu of providing the circuit directory.

B. Bussing shall be copper, and lugs or main breaker, and branch circuit breakers shall have ampere ratings indicated. Breakers shall be connected to bus in a sequence phase arrangement.

C. Two-pole and three-pole breakers shall have common trip and pad-lock off feature. Breakers shall be quick-make, quick-break, thermal magnetic (18,000 AIC RMS symmetrical minimum at 240V, and 18,000 AIC RMS symmetrical minimum at 480V unless indicated otherwise) having mechanism insuring full contact pressure until the time of opening, whether actuated either automatically or manually. When automatically actuated, the breaker mechanism shall be trip free of the handle so that the contacts cannot be held closed against a short circuit or abnormal overload. Circuit breaker contacts shall be non-welding silver alloy, housed in arc chambers equipped with arc quencher plates and the circuit breaker mechanisms, enclosed in molded insulating cases, shall be sealed to eliminate tampering. Trip position shall be between the "on" and "off" positions to positively identify faulted and overloaded circuits from "off" circuits.

D. Panelboards shall be factory-assembled type rated maximum 600V AC (Square D I-Line, GE Spectra, Eaton POW-R-Line 4, or Siemens P4 or P5 will be acceptable).

2.3 CIRCUIT BREAKERS

A. Each circuit breaker shall have continuous current rating visible without removing an enclosure cover, and the rating shall be engraved. This may be accomplished by installation of a phenolic label (white with black cut letters) adjacent to the circuit
breaker. Circuit breakers shall be suitable for use with 75 degree C conductors. Where circuit breakers are used to supply HVAC equipment having motor group combinations, type HACR circuit breakers shall be used. Circuit breakers installed in existing panelboards or switchboards shall be of the proper type to be installed therein, shall include bussing kits/alterations as required, and shall have an interrupting capacity of not less than that of the existing circuit breakers. Where circuit breakers are not available to fit existing panelboard, panelboard shall be removed and replaced with new. Circuit breakers used for vending machines, hard-wired electric water coolers, hand dryers, and for other indicated equipment shall be GFI type.

B. Unless indicated otherwise, circuit breaker spaces and spare circuit breakers shall be divided equally between sections of multi-section panelboards.

C. Where a circuit breaker with adjustable long time trip (where cover over adjustment is not lockable per NEC 240.6 (C)) is used, conductor size for the protected feeder shall be increased by the Contractor to match maximum long time setting of the circuit breaker.

D. Circuit breakers in panelboards shall be fully rated for AIC; that is, series ratings are not acceptable.

E. Circuit breakers used for elevator power circuits shall have adjustable solid state trip (LSI), lock-off feature, and auxiliary contact for interface with battery lowering system.

F. Where the highest continuous current trip setting of a circuit breaker is rated or can be adjusted to 1200A or higher, the circuit breaker shall have solid state trip unit with clearing time reduction feature per NEC 240.87.

G. Circuit breakers used for power sources to fire alarm system equipment shall be dedicated to fire alarm equipment. Each shall have red-colored marking and labeled “FIRE ALARM CIRCUIT”, as well as provided with a circuit breaker lock-on device.

2.4 FAULT CURRENT AND PROTECTIVE DEVICE COORDINATION STUDY

A. A fault current and protective device coordination study shall be prepared by the Contractor within 30 calendar days following final review of circuit protective devices, including circuit breakers, fuses, overloads, and protective relays. The study shall include calculations and composite time-current characteristic coordination curves (in color) to demonstrate optimum coordination of protective devices to be installed and to protect equipment and conductors against fault currents and sustained overload conditions for conductors and equipment to be installed. The study shall include the proper ratings of fuses and proper settings of adjustable circuit breakers associated with the protection of equipment and conductors and optimum selective coordination. If necessary, the study
shall also make recommendations for changes to new protective devices, and these changes shall be made by the Contractor at no additional cost to the Owner; for this reason, the study shall be finalized prior to Contractor releasing equipment for production. Also for this reason, the Contractor should consider using the panelboard manufacturer to make this study. Contractor shall test and calibrate protective devices in accordance with the manufacturers' specification after making the proper device settings and before the initial energization of the conductors and equipment. Contractor shall obtain required data from the utility company. The Study shall be submitted as printed copies using color copies for the coordination curves. The Study shall be prepared by a registered professional Engineer and shall contain his signed and dated seal on the first page.

B. The scope of this study shall not only be limited to the equipment indicated on the Schematic Feeder Diagram; rather, the study shall also address safety switches, motor starters, branch circuits (including those rated 20A and less), etc. This will require a complete understanding of the entire set of construction documents by the preparer of the study.

C. Unless otherwise noted, selective coordination shall consist of localization of an overcurrent condition to restrict outages to the circuit or equipment affected, accomplished by the selection and installation of overcurrent protective devices and their ratings or settings for the full range of available overcurrents, from overload to the maximum available fault current, and for the full range of overcurrent protective device opening times associated with those overcurrents.

D. Partial or limited coordination, such as coordination for operating times of only 0.1 seconds or longer, will not be considered acceptable. Selective coordination shall be documented in the study for all times, including those (below 0.01 seconds) that may not be able to be represented using time-current curves. This documentation may further require manufacturer-specific testing results, ampacity ratio tables for specific fuses, coordination testing results for circuit breaker frame sizes at specific fault current levels, etc.

E. The study shall be prepared by a licensed professional engineer engaged primarily in the design, installation, or maintenance of electrical systems. Furthermore, the study shall contain the engineer's seal and date indicating responsibility for the correctness of the study. The selection shall be documented and made available to those authorized to design, install, inspect, maintain, and operate the system.

F. A phenolic nameplate (white with black-cut letters) shall be provided on each item of switchboards, switchgear, and panelboards to indicate "available fault current is _____ KA" and date that "calculation was performed on _____."

G. An ARC flash hazard study in accordance with NFPA 70E guidelines shall be prepared by the Contractor, along with the study indicated above, to provide a summary
table to include energy levels/faults, equipment characteristics, working boundaries, and hazard/risk categories for panelboards, circuit breakers, safety switches, motor starters, etc. The study shall include complete descriptive narratives of methods used and effect of the results. The Contractor shall also install the specific NFPA 70E arc flash labels on the exterior surfaces of each equipment item; except for panelboards in dwelling units.

PART 3 - EXECUTION

3.1 UNDERGROUND MAIN SERVICE

A. Arrange with local power company to provide 4-wire, 3-phase, 120/240 volt main service to the point indicated.

B. Main underground service feeders shall be furnished and installed from the building service equipment to the connection to the power company service as work of this Section.

C. Primary cable and transformer will be provided by the power company.

D. Work of this Section shall begin at the point where the power company terminates its work.

E. Fees and charges in connection with the above shall be paid as work of this Section and shall be included in the bidder's price.

3.2 EMERGENCY LIGHTING SYSTEM

A. Emergency fixtures including internally illuminated exit signs shall be permanently fixed in place and connected to building branch circuits. Fixtures shall contain a rechargeable battery, battery charging means, one or more lamps and other components to be UL approved and meet NEC Article 700.12(F).

B. Where battery backup for fixtures is used with switched branch circuits, the sensor circuit of each fixture shall be connected ahead of any local switching. This will permit "switching-off" fixture without signaling to sensor circuit that a power failure has occurred and "turning-on" of lamps on battery circuit. A failure of the branch circuit shall cause the lamps to turn on whether the switch is in the on or off position.

C. Exit fixtures shall not be switched.

3.3 PANELBOARD SIZING AND LOCATIONS
SECTION 265000 - ELECTRICAL LIGHTING

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes labor, materials, and equipment indicated, specified, and necessary for a complete and operating lighting system and related systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

PART 2 - PRODUCTS

2.1 EXIT LIGHTS

A. Exit lights shall be Lithonia LES-R-120/277/ELN-SD series with red letters on a metal stencil. Stencil and trim shall be cast aluminum. Housing shall have matte black finish and stencil shall have brushed aluminum finish. Each fixture shall have concealed LED’s. Unit shall be rated for dual voltage 120/277V. Housing thickness shall be maximum 1 7/8”. Units shall be UL approved with nicad battery, two-stage solid state charger, pilot light to indicate charging mode, test switch, and accessories (operation in emergency mode shall be 1½ hours minimum). Each shall have an NFPA approved self-test feature that tests the battery and provides visual signal upon sensing a battery failure. See symbol schedule on drawings for mounting details. Fixtures shall meet NFPA 101, with Chevron style arrows.

2.2 LIGHTING FIXTURE GENERAL REQUIREMENTS

A. Fixtures shall be as specified in schedule on drawings. However, each lighting fixture shall be fully compatible with the ceiling type in the area in which it is to be installed. During the preparation of submittal, Contractor shall coordinate the mounting type required for each lighting fixture with the type of ceiling system in the area in which the fixture is to be installed. Contractor shall coordinate with architectural ceiling plans and other details and adjust the mounting type of each lighting fixture proposed to be installed to suit the associated ceiling system regardless of the specified lighting fixture mounting details specified. Submittal shall also include recommended installation details for each lighting fixture to suit the type of associated ceiling system.
B. Fixtures to be installed in damp or wet locations shall be labeled by Underwriters' Laboratory for that purpose.

C. Fixtures shall be finished (painted or other finish as specified) after fabrication.

D. Trims for recessed fixtures shall be of the type necessary for compatibility with each ceiling type (such as concealed T, wide T, slot grid, flange trim, etc.). Coordinate with architectural drawings and specifications.

E. Where ceiling tiles are thicker than standard ceiling tiles, fixture throat/trim ring assemblies shall be custom-made to accommodate the ceiling system.

2.3 LED (LIGHT EMITTING DIODE) LIGHTING FIXTURES

A. Provide LED fixtures complete with LED module, aluminum heat sink, drivers, and other accessories as shown on drawings.

B. Fixtures shall be completely designed based on LEDs and not designed around an LED-based lamp meant to install into an existing fixture. Retrofit LED lamp/module into an existing fixture shall not be allowed.

C. Aluminum Heat Sinks: All LED luminaires shall have an aluminum heat sink integral to fixture housing and designed for proper electrical bonding of LED module to allow maximum heat dissipation and to provide thermal management within the allowable operating range of the LED as specified by the LED manufacturer. The junction temperature (Tj) of each LED shall not exceed the maximum junction temperature specified in the manufacturer's product data sheet.

D. Unless noted otherwise on the drawings, LEDs installed in each fixture shall be of the type specifically recommended by the manufacturer of the fixture for use in the fixture.

2.4 LED (LIGHT EMITTING DIODE) DRIVERS

A. Provide LED system drivers, of ratings, types and makes as recommended by LED manufacturer. Driver for LED systems shall be electronic, 1 phase, 60 hertz, high power factor, constant current without elevated inrush current, electronic, low noise level, a minus 40 deg C temperature rating, and shall be furnished by the manufacturer of each type or particular lighting fixture specified.

B. Driver shall have a Class A sound rating.
C. Driver shall have a guaranteed minimum power factor of 0.90. (PF = Watts/Volt-Amps).

D. Driver shall be installed inside an electrical enclosure. Wiring inside electrical enclosure shall comply with 600V/105degC rating or higher.

E. Driver shall be available in a plastic/metal can or all metal can construction to meet all plenum requirements.

F. Driver shall be provided with poke-in wire trap connectors or integral leads color coded per ANSI C82.11.

G. Driver shall comply with UL standard UL1012

H. Driver shall have a rated lifetime of 50,000 hours

I. Driver shall operate from 60 Hz input source of 120 to 277V with sustained variations of +/- 10% (voltage and frequency) with no damage to the driver.

J. Driver output shall be regulated to +/- 5% across published load range.

K. Driver input current shall have Total Harmonic Distortion (THD) of less than 20%

L. Driver shall reduce output power to LEDs if its case temperature exceeds 85C - thermal protection.

M. Driver shall tolerate sustained open circuit and short circuit output conditions without damage and without need for external fuses or trip devices

N. Driver shall be IP64 rated except as indicated.

O. Driver shall not contain PCBs.

P. Driver shall comply with ANSI C62.41 Category A for Transient protection.

Q. Driver shall comply with the requirements of the Federal Communications Commission (FCC) rules and regulations, Title 47 CFR part 15, Non-Consumer (Class A) for EMI/RFI (conducted and radiated).

R. Driver shall be manufactured in a factory certified to ISO 9002 Quality System Standards.
S. Driver shall carry a five-year manufacturer's warranty from date of manufacture against defects in material or workmanship, including replacement, for operation at a maximum case temperature of 90°C.

T. Driver manufacturer shall have a fifteen year history of producing electronic drivers for the North American market.

U. Battery backup shall be manufactured to provide a minimum of 1400 lumens per fixture for 1½ hours operation during the emergency mode. Fixture shall contain an integral manual test button for testing purposes to provide a visual and audible alarm. A test button remotely installed from the fixture is not acceptable.

2.5 LED (LIGHT EMITTING DIODE) MODULES

A. LED Modules shall be of the type, color, and optical distribution indicated, as shown, and scheduled

B. LEDs shall be handled and soldered to printed circuit boards (PCBs) according to the manufacturer's specifications.

C. LEDs shall produce a white light of the color temperature shown on the Fixture Schedule located on the drawings and not less than 75CRI value on the color rendering index.

D. LEDs shall be high brightness and high output.

E. LED performance and lumen maintenance testing shall be performed in accordance with IES LM-79-08 and LM-80-08.

F. LEDs shall provide approximately 50,000 hours of lighting at a level not less than 70% of initial lumen output. LEDs shall operate from 60 Hz input source of constant 350mA with sustained variations of +/- 10% (current and frequency) with no damage to the LEDs.

G. LED lumen output shall be regulated to meet or exceed the published standard minimum Luminous flux.

H. Unless stated otherwise, LEDs shall be 3500K in color and shall be within +/- 200K of specified color temperature and shall be from the same bin.

I. LED manufacturer shall utilize strict binning and labeling techniques to ensure consistent brightness within +6 lm of published standard luminous flux and consistent chromaticity within +/-200K of specified color temperature per bin. Each bin shall be labeled with appropriate bin code relative to luminous flux and chromaticity.
J. LEDs shall have a minimum operating temperature of -40C.

K. LEDs shall be environmentally friendly, contain no mercury, lead or other heavy metals, and manufactured in compliance with RoHS and REACH.

L. LEDs and associated components of the LED Modules shall be manufactured in a factory certified to ISO 9002 Quality System Standards.

M. LEDs and associated components of the LED Modules shall carry a five-year manufacturer's warranty from date of manufacture against defects in material or workmanship, including replacement, for operation within specified system design parameters.

N. LED manufacturer shall have a fifteen year history of producing LEDs for the North American market.

PART 3 - EXECUTION

3.1 SUPPORTS

A. For any type ceiling which itself does not provide sufficient support for fixtures, either arrange with other subcontractors to strengthen ceiling or support fixtures from structure above independently of ceiling.

B. Suspended linear fixtures in continuous rows shall have one stem at the beginning of the row, one stem at each channel joint, and one stem at the end of the row.

C. Linear fixtures mounted individually on stems shall each have two single stem hangers. Linear fixtures individually surface mounted shall be supported at both ends.

D. Linear fixtures surface mounted in continuous rows shall have one support at the beginning of the row, one support at each channel joint, and one support at the end of the row.

E. Recessed fixtures installed in plaster ceilings and gypsum board ceilings (including ceilings with glue-on acoustical tiles) shall be furnished with metal plaster frames or other suitable mounting frames.

F. Recessed fixtures shall be so adjusted to their supports that their trim flanges fit tightly and evenly against the surface of the ceiling.
G. In acoustical tile ceilings with exposed mechanical suspension systems, recessed linear fixtures (fluorescent and LED) shall be lay-in type. Fixtures so supported shall be securely fastened to the ceiling's framing members by approved fixture support clips (4 required per fixture). Metal fixture appendages that simply fold down over the ceiling's framing members are not acceptable. Arrange with other subcontractors to support ceilings at each corner of each of these fixtures (not more than 6 inches from each corner) in order to assure that the ceiling will not sag (or fail) during construction or in the future due to the weight of the fixtures. Providing independent fixture support tie-wires from the structure in lieu of proper ceiling support is not acceptable.

H. Large fixtures (generally, those required by manufacturer) shall be supported from the structure above ceiling with %" diameter threaded galvanized rods and necessary Unistrut or angles, in addition to the support furnished by ceiling.

3.2 LOCATION OF FIXTURES

A. Work of this Section includes advising other trades of exact location of recessed fixtures so that ceiling construction and/or spacing may be coordinated as necessary to permit symmetrical positioning of fixtures in room.

B. Locations for lighting fixtures shall be per Architectural reflected ceiling plans.

C. For acoustical tile ceilings, surface and/or suspended fixtures shall be centered on a tile or a tile joint, unless indicated otherwise.

D. The locations of fixtures in Mechanical Equipment Rooms and Boiler Rooms are approximate. The Contractor shall determine exact locations based on exact locations of mechanical equipment.

E. Where installed under metal-corrugated sheet roof decking, lighting fixtures shall be installed and supported so there is no less than 1 1/2 " between the lowest surface of roof decking and the top of any part of the lighting fixtures.

3.3 INSTALLATION AFTER PAINTING

Fixtures to be installed in or on painted ceilings and/or walls shall not be installed until painting is completed. Fixtures installed with paint applied over factory finishes will be rejected.

3.4 PROCEDURE

The Contractor shall demonstrate to the Owner at his convenience the proper procedure for replacing LED modules and associated drivers for each type of fixture.
3.5 CLEARANCE

Thermal or acoustic insulation shall not be installed over the top or within 3 inches of the sides of a recessed fixture enclosure, wiring compartment, or ballast unless the equipment is labelled for the purpose. Thermal or acoustic insulation shall not be installed over the top of a recessed fluorescent fixture. Work of this Section includes advising other trades of this requirement, so that proper clearances are maintained.

3.6 FIXTURE COORDINATION

Lighting fixture submittal shall include data on each type of ceiling suspension system and associated acoustical tile. Information on the ceiling suspension systems shall include types of recessed fixture suitable for use with each type as well as recommended installation details.

3.7 FIXTURE ADJUSTMENT

Aim adjustable fixtures at night as directed by Architect or his designated representative. Furnish any equipment necessary for aiming fixtures. Equipment shall include but not be limited to bucket trucks, aerial booms, ladders, tools, meters and personnel. Use a factory prepared aiming diagram.

- END OF SECTION -
SECTION 270500 - COMMUNICATION SYSTEMS

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing all labor, materials, and equipment indicated, specified, and necessary for complete and operating systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

1.3 SYSTEMS INVOLVED

A. Systems involved include the following:
   1. Raceways and Wiring for Voice/Data Outlets and Telephone Outlets
   2. Cable TV Distribution System
   3. Two-Way Emergency Communication System

1.4 VOICE/DATA AND TV COMPANY SERVICE

A. The location of voice/data and Cable TV utility company facilities (power poles, manholes, etc.) are shown where designated by voice/data and Cable TV utility company during the design phase. Contractor shall coordinate the exact locations of these with voice/data and Cable TV utility company and plan for contingencies. All raceway routings associated with voice/data and Cable TV utility company facilities shall contain large radius elbows. Contractor shall also provide additional pull boxes as required by the voice/data and Cable TV utility company facilities and plan for contingencies. A minimum of 36" of separation shall be maintained between raceway routings associated with power utility service and raceway routings associated with voice/data/TV utility company facilities.

B. Contractor shall notify the Owner in writing to remind them no less than 12 weeks prior to the scheduled project completion date that the Owner is responsible for scheduling telephone and data services by setting up accounts, etc.

PART 2 - PRODUCTS
2.1 RACEWAYS AND WIRING FOR VOICE/DATA OUTLETS AND ANALOG TELEPHONE OUTLETS

A. Contractor shall furnish and install backboards, terminal blocks, patch panels, outlets, cables and raceways, and all other equipment, whether specifically indicated or not, for a complete and properly operating system.

B. Voice/data wall outlets shall be same as data wall outlets except each shall have one voice jack (white color, 8-position, category 6 module), one data jack (blue color, 8-position, category 6 module), and module blank covers and labeling (type written). These jacks will be used for data and VoIP.

C. Ceiling-mounted wireless access points shall consist of flush ceiling outlet box (4" octagon x 1 1/2" deep, or larger) with one data jack (violet color, 8-position, category 6 module) on round plate. Wireless access points will be provided by Owner.

D. Provide a cable for each jack which shall be UL listed, 4-pair, 24 AWG, UTP (unshielded twisted pair) jacketed, plenum type, category 6. The voice cables and telephone cables shall have white-colored jacket and shall route up the raceway stub-up and then above the ceiling (attached with J-hooks) to terminate on patch panels since VoIP will be used. The data cables shall have blue-colored jacket and shall route up the raceway stub-up and then above the ceiling (attached with J-hooks) to terminate on patch panels on nearest special systems backboard. The data cables for wireless access points shall have violet-colored jacket in lieu of blue. The cables for analog voice and telephone (used for emergency communication systems, elevator cabs, fire alarm, etc.) shall be terminated on terminal blocks in lieu of patch panels. The patch panels for the VoIP shall be separate from the data patch panels.

E. Backboards shall be 8' high by width as indicated by ¾" thick plywood. Bottom of backboards shall be 6" above floor unless noted otherwise. Provide raceways from each backboard to space above accessible ceiling for routing cables to backboards. Raceways shall be terminated with bushings even with top and/or bottom of backboards. Backboards shall be painted with two coats of fire retardant paint prior to cable installation.

F. Cable runway shall be a minimum of 18" wide and shall be black in color. All cable runways shall be installed and secured as per the manufacturer's installation instructions. All cable runways crossing above racks shall be secured to and supported above each rack using a cable runway standoff support. All cable runways shall be properly grounded.

G. Racks shall be 7' in height and shall support 19" rack-mount widths. Racks shall be installed and secured as per the manufacturer's installation instructions. Racks shall be positioned within the room to allow access to both the front and rear of all racks.
When planning access to the rear of the racks, consideration should be made for the fact that equipment mounted in the rack will often extend at least 24 –30" behind the rack. As such, adequate allowance shall be made to the rear of the rack to allow for access behind the racks even after equipment is permanently installed. Racks shall be Atlas full-height with door and accessories for equipment mounting. All racks shall be properly grounded.

H. Vertical managements shall be a minimum of 10" wide. Vertical managements shall be double-sided to allow routing of cables front and rear. Both front and rear vertical managements shall have hinged doors to hide cables. A vertical management shall be installed between each rack in the room. All vertical managements shall be installed and secured as per the manufacturer's installation instructions.

I. Cable runway drops shall be installed to accommodate the cable bend radius in order to transition cable routing from horizontal cable runways and into each of the vertical cable managements. Cable runway drops shall be mated for 18" cable runway. All cable runway drops shall be installed and secured as per the manufacturer's installation instructions.

J. Provide the appropriate quantity of type 110, category 5e, punch-down terminal blocks on backboards for termination of each conductor in each cable from analog telephone (voice) jacks and for termination of each conductor in each multi-conductor analog cable connecting the various backboards; these shall be punched down. Properly label (with permanent labeling means) each cable with room number and/or designation of jack connected thereto. Provide labels on each terminal block at backboards corresponding to room number and/or designation of jack connected thereto. Provide cross-connects for all conductors.

K. Provide the appropriate quantity of patch panels and racks for termination of all cables, and terminate each conductor in each cable from data jacks and VoIP voice jacks where VoIP is used. The patch panels for VoIP cables shall be separate from patch panels used for data cables. Each patch panel shall be Category 6, with 48 ports, rack mounted. Wall mounted racks and/or floor-mounted racks shall be provided to accommodate patch panels, data switches, UPS's, etc. and other equipment including Owner-furnished equipment. Wire management accessories shall be provided for proper, neat installation. Properly label (with permanent labeling means) each cable with room number of jack connected thereto. Also, label patch panels with room numbers. Provide patch cords as directed by Owner to connect patch panels to Owner-furnished data switches.

L. Where patch panels are used for POE equipment such as wireless access points, IP-based cameras, etc., they shall be in addition to and separate from patch panels for voice/data.
M. Provide an analog telephone (voice) cable in a 3/4” raceway from elevator controller (connected to traveling cable) to telephone (voice) outlet in elevator equipment room and make connections to an elevator cellular communication for the telephone in elevator cab. See elevator paragraph in Electrical General Provisions for telephone provisions. Also provide analog telephone cables, jacks, etc. for two-way emergency communication system. See emergency communication system paragraphs for telephone cable requirements. These cables shall be provided and tied directly into the utility copper line even if the telephone system in the building is VoIP.

N. Arrange with the Owner’s communication service provider for them to provide their fiber and/or copper cables to the main backboard and terminate.

2.2 CABLE TV DISTRIBUTION SYSTEM

A. Contractor shall provide wiring, raceways, outlets, connectors, splitters, and other equipment, whether specifically indicated or not, to provide a complete and properly operating cable TV distribution system.

B. Work shall include providing a complete and operable RF distribution system. The installer shall present evidence of having successfully completed at least three similar projects, and installation shall be under the supervision of factory authorized organization. Complete description of present service facilities shall be provided by supplier.

C. All electronic equipment shall be approved by Underwriters' Laboratories, Inc., and shall be products of a single manufacturer of established reputation and experience. Furnish all necessary equipment, labor, and installation materials, whether individually specified or not, to provide a complete and operating system.

D. System shall provide for reception of monochrome or color T.V. transmission at every outlet equal to that obtainable on a single standard receiver connected directly to Cox Cable's service cable. System shall be designed for a 43 DB signal-to-noise ratio and minus 46 DB cross-modulation level at the output of the amplifier.

E. The outlets, located as shown on drawings, shall provide the following minimum signal levels, all measured across 75 ohms: Plus 6 DBMV.

F. All equipment shall be UL rated for 24 hours a day continuous operation.

G. Amplifiers, if required, shall be capable of accommodating all of Cox Cable’s channels. Amplifier shall be manufactured by Blonder Tongue or Jerrold and shall be as required for the application.

H. Each outlet shall consist of outlet box (4" square x 1½" deep, or larger), 1-gang raised device cover, and device plate with panel-mount dual female "F" type
connector. Cable inside box shall be provided with a male connector to connect to the dual connector. Finish and type of plate shall match that specified for wiring device plates.

I. The CATV cable from each outlet shall be West Penn #25841 or Belden #9114 type RG-6 (75 ohm) double shielded (foil and braid) plenum-rated, and shall be routed continuously (without splice) to nearest CATV backboard and shall be connected to splitters. The CATV cable linking the CATV backboards shall be type RG-11 (75 ohm), unless the CATV utility company requires a different type of cable.

J. CATV backboards shall be ¾” thick plywood of the size indicated. Bottom of backboard shall be 6” above floor unless noted otherwise. Backboards shall be painted with wall prior to cable installation. Provide sufficient slack cable and connectors at backboards to terminate all cables. Provide splitters to properly connect and distribute the CATV signal. Arrange with the Owner’s CATV service provider for them to provide their cable to backboard and terminate their cable to provide cable TV service.

2.3 TWO-WAY EMERGENCY COMMUNICATION SYSTEM

A. Contractor shall furnish and install the stations, wiring and raceways, and all other equipment, whether specifically indicated or not, to provide a complete and properly operating area of refuge communication system.

B. Two-way emergency communication stations shall consists of flush backbox with speaker and call-in button mounted on a flush plate, with the appropriate signage. Stations shall be equal to Talk-A-Phone series AOR-CSE-FM.

C. Two-way emergency communication master station shall be flush mounted, capacity to communicate with eight stations, with recessed handset, indicator lights and audio/visual alarm mounted in stainless steel door. Master stations shall be equal to Talk-A-Phone series AOR-8 with integral UPS with 4-hour battery. It shall automatically make an outside-line telephone call to a programmable telephone number if no one answers a call at this station within a certain time limit.

D. Provide a telephone (voice) cable in raceway from master station to nearest telephone backboard and terminate. Provide 120 volt circuits.

E. Provide an engraved phenolic nameplate adjacent to each two-way emergency communication station and communication master station to indicate directions for the use of the two-way communication system, instructions for summoning assistance via the two-way communication system, written identification of the location of the two-way communication station, and directions for the use of the two-way communication station. The two-way communication system shall be accordance with ADA-ABA 207 and 216.
F. One possible location for the master station is shown on the drawings. Contractor shall contact the Fire Marshal and obtain the preferred location for this project.

PART 3 - EXECUTION

3.1 RACEWAY AND WIRING INSTALLATION FOR VOICE/DATA OUTLETS AND TELEPHONE OUTLETS

A. Raceways shall contain not more than two 90 degree bends.

B. Where wiring is installed above ceilings (without raceways and not in cable trays), they shall be properly supported from structure per National Electrical Code. Where ceilings are accessible, Contractor shall use J-hooks (equal to Mono Systems Series H-433-S or H-233-S) and/or cable trays; and the routing shall generally be from each outlet to nearest corridor, then through corridor (above ceilings) to nearest voice/data backboard and patch panel. Routing through corridor ceiling space shall make use of cable trays (where shown and/or preferred by Contractor) or J-hooks with 12" cable support extenders (equal to Mono Systems Series H-CSE-12). Where ceilings are inaccessible, Contractor shall provide raceways that span these areas.

C. At backboards, for each outlet served, provide a sleeve through the wall and/or ceiling to the area above the accessible ceiling to provide openings of sufficient size for cables.

D. Installers shall be certified.

E. Submittal shall include a 1-line diagram showing all components of the system including Owner-furnished equipment. Also see Specification Section 16010, Paragraph 2.3.E.

F. All wiring and connections shall be tested per ANSI/TIA/EIA standards. Test reports shall be provided.

G. Provide a copper Telecommunications Grounding Busbar (TGB) to satisfy TIA/EIA and BICSI requirements at each backboard. TGB shall be 1/4" x 2" x 12" in size and contain pre-drilled to suit the User’s requirements. TGB shall standoff from the backboard by 2' using insulator. Provide a #6 THHN ground conductor in raceway from the TGB (at backboard used for voice/data service) to the grounding electrode used for electric service. Also provide a #6 THHN ground conductor in raceway to link all backboards and terminate.
H. When underground conduit(s) are installed for voice/data service from utility company, Contractor shall coordinate the exact location for termination of conduit(s) (and points of demarcation) with utility company.

3.2 CABLE TV DISTRIBUTION SYSTEM INSTALLATION

A. Backboards shall be ¾” thick plywood of the sizes indicated. Bottom of backboards shall be 6” above floor unless noted otherwise. Raceways shall be terminated with bushings even with top and/or bottom of backboard. Backboards shall be painted with two coats of fire retardant paint prior to cable installation.

B. In areas with accessible acoustical tile ceilings, the raceways from the outlets may be bushed and terminated above the ceilings at the locations indicated. At the backboards, for each outlet served, provide a sleeve through the wall and/or ceiling to the area above the accessible tile ceiling to provide openings of sufficient size for cables. Removal and replacement of the acoustical tiles in the accessible ceilings to permit installer to install his cable shall be the responsibility of the DIVISION 16 Contractor; any tile damaged, marred, and/or soiled in this process shall be replaced at his expense.

C. Where wiring is installed above ceilings (without raceways and not in cable trays), they shall be properly supported from structure per National Electrical Code. Where ceilings are accessible, Contractor shall use J-hooks and/or cable trays. Where ceilings are inaccessible, Contractor shall provide raceways that span these areas.

D. When underground conduits are installed for CATV service from utility company, Contractor shall coordinate the exact location of termination of conduit(s) (and point of demarcation) with utility company.

3.3 TWO-WAY EMERGENCY COMMUNICATION SYSTEM INSTALLATION

A. Wiring shall be provided as necessary for proper system operation and shall be installed in raceways.

B. System shall be installed by a qualified emergency communication system technician. Devices shall be individually tested. A final operational test should be conducted to the entire system. After wiring and construction is completed, system shall be certified by equipment supplier in writing as being complete and properly operating.

C. Contractor shall, after completion of the project, arrange with equipment supplier to train designated owner personnel in proper operation and maintenance of the system.

-END OF SECTION -
SECTION 283100 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 SCOPE

Work described in this Section includes providing all labor, materials, and equipment indicated, specified, and necessary for complete and operating systems in accordance with SECTION 260000 - ELECTRICAL GENERAL PROVISIONS.

1.2 APPLICABLE PARAGRAPHS

Applicable paragraphs of SECTION 260500 - ELECTRICAL BASIC MATERIALS AND METHODS, shall apply to this Section as though repeated herein.

1.3 SYSTEMS INVOLVED

A. System involved include the following:

1. Fire Alarm System

1.4 FIRE ALARM SYSTEM SUBMITTALS

A. Contractor shall have a certified fire alarm installer prepare the submittal (consisting of equipment brochure booklet and shop drawings with plan view and one line schematic drawings for the work of this contract.)

B. Equipment brochures shall consist of items specified hereinafter and items that are pertinent to the work. The brochures shall include a sequence of operation, battery calculations, and statement identifying "type of system". These brochures shall be submitted for review per Paragraph 16010.2.3. Where remote station monitoring is required, brochures shall provide the name of the monitoring company (which must be Fire Marshal approved). Where system is high-rise type, submittal shall include type of signaling system, type of evacuation system ("zoned" or "general"), and methods of protection for panels, circuits, etc.

C. Shop drawings shall indicate sizes, quantities, and types of conductors, cables and details necessary to install the work, to include strobe candela ratings.

D. A PDF file of the submittal shall be provided to the Architect for review. In addition, a PDF file and one full-sized printed (hard) copy of the submittal shall be provided to the Electrical Engineer for review,
E. After the A/E completes their review and the Contractor has incorporated the comments, Contractor shall make his online application and payment to the Fire Marshal and attach the final reviewed submittal containing the A/E review stamp. He shall select the option “STAMPED SHOP DRAWINGS ATTACHED”, which will allow Fire Marshal review without further involvement by Professional of Record.

F. If additional clarifying details and/or components are required by the Fire Marshal, Contractor shall prepare the details, provide components, and secure approval at no additional cost to the Owner. Installation shall not begin until the Fire Marshal's review is complete.

G. Operating instructions provided to the Owner shall include submittal brochure, shop drawings, and booklet including device addresses to match shop drawings, and control commands for doors, HVAC, elevators, etc.

PART 2 - PRODUCTS

2.1 FIRE ALARM SYSTEM

A. There is an existing fire alarm system that shall be completely removed and replaced with a new system. Removal shall include wiring and raceways. Contractor shall furnish and install smoke detectors, air-stream smoke detectors, heat detectors, pull stations, signals, door hold-open devices, monitor modules, control modules with relays, control panel, DACT, wiring and raceways, and all other equipment, whether specifically indicated or not, to provide a complete and operating addressable analog, non-coded, supervised fire alarm system to meet the requirements of NFPA 72 and all other applicable Life Safety Codes.

B. Contractor shall provide wiring as recommended by the manufacturer and it shall be indicated in the point-to-point interconnection drawings that shall be included with the submittals. The completed installation is to conform to applicable sections of NFPA 72, local and state code requirements and the National Electrical Code. Entire system shall have battery backup to meet NFPA and local codes plus 20% spare capacity.

C. Wiring for initiation devices shall be arranged per NFPA 72, to limit the quantity of devices connected to each addressable interface point in control panel. Wiring for voice notification systems shall be provided in separate zones to accommodate the voice zone selector switches.

D. Pull stations shall be addressable, double action type, metal or Lexan housing with red finish on flush outlet box. Where surface mounting is allowed, a full size backbox made specifically for manual stations shall be used. Backbox color shall match wall finish.
E. Smoke detectors shall be photoelectric, low profile, addressable, analog type with base mounted on flush outlet box. Smoke detectors shall communicate actual smoke chamber values to the system control panel. Sensors shall be listed to UL 268. Sensors shall be listed as compatible with the control equipment and shall, in combination with this control equipment, be able to generate sensitivity reports acceptable to the Authority Having Jurisdiction as automatically meeting NFPA sensitivity testing requirements. Sensors shall be fully field programmable for sensitivity levels and indicate when maintenance is required. Each sensor base shall contain an LED that will flash each time the detector is scanned. LED shall also indicate when the sensor is in alarm.

F. Air-stream smoke detectors shall be addressable analog detectors. Performance shall be as described for smoke detectors. A remote test station (with indicator light and keyed test switch on a single-gang plate to be engraved with associated air unit designation) shall be provided for each air-stream smoke detector. Each remote test station shall be in a flush outlet box at a location as directed (generally at a readily accessible place in the associated mechanical room, unless a location is indicated on the drawings. Provide wiring in raceways from detector(s) to remote test station. Test station shall not be addressable device with a different address than the detector. For each air-stream smoke detector, provide an addressable control module with relay at either the air handling system associated with the air-stream smoke detector or the damper associated with the air-stream smoke detector and program the control module for fan shutdown and/or damper closing control resulting from activation of the associated air-stream smoke detector. However, in accordance with IBC and NFPA, when multiple air handling systems are associated with a common air plenum, fan/damper shutdown shall occur for all of these air handling systems upon activation of any air stream smoke detector associated with these air handling systems. Provide wiring and raceways from control module relays to the mechanical control equipment (starters, control panels, dampers, etc.) for this control unless it is being done by the mechanical controls contractor. Air-stream smoke detectors shall be as follows:

1. Where air-stream to be sensed passes through a duct, the air-stream smoke detector shall be a duct type smoke detector with housing and air sampling tubes. These shall be located in accordance with NFPA 72 requirements with exact location to be coordinated with the Division 15 contractor. Multiple duct smoke detectors shall be provided at each location where ducts split into multiple ducts that cannot be monitored by a single detector. However, where an air-stream smoke detector is indicated to be installed in either the supply of an unconditioned outside air duct or located outside exposed to ambient air, a smoke detector shall be pendant-mounted inside the duct. The smoke detector shall be air-handling system rated (UL 268A) and shall be suited for high humidity and high velocity (minimum 2,000 feet-per-minute) environments. Coordinate with other trades to provide an access panel in duct to allow access to the smoke detector.
2. Where air-stream to be sensed does not pass through a duct (or the detector type indicated above is impractical), the air-stream smoke detector(s) shall be located in accordance with NFPA 72 Paragraphs 17.7.5.4.2 and A17.7.5.4.2 and shall be of the type (and quantity) suitable and UL listed for the application (including air velocity). Opening sizes may require a large quantity of detectors.

G. Heat detectors shall be used where indicated and in lieu of smoke detectors where moisture will cause the smoke detectors to malfunction. Each shall be addressable and shall be rate-of-rise or fixed temperature type as appropriate. Where used in association with elevator sprinkler heads, they shall be fixed temperature type with temperature lower than sprinkler head temperature and one shall be located within two feet of each head.

H. Bases for addressable smoke detectors shall be identical to bases for addressable heat detectors so that smoke detectors can be changed by simply unplugging the smoke head and plugging in a heat head. The system shall automatically recognize the new device and operate on a default program designed for the new device. The Fire Alarm Control Panel shall automatically be notified of any device changes and the exact location of these changes.

I. Ceiling-mounted fire alarm devices (smoke detectors, heat detectors, signal devices, etc.) shall be installed in the center of the ceiling tile where installed in lay-in ceiling systems.

J. Provide a small permanent label on each addressable device to indicate the address.

K. Audiovisual signal units shall be wall mounted horns with strobe lights with off-white plate/housing. Strobe lights shall be xenon flasher, with the word "FIRE" and shall be ADA compatible and listed to UL 1971. Units shall be mounted on flush outlet boxes. Mounting height to the bottom of the device lense shall be 80" above the highest floor level within the space. Strobe intensity at each location shall be selected to meet ADA and NFPA 72. Where there are more than two units in a space, units shall flash in synchronization. Audio unit shall be selected to provide adequate volume at each location.

L. Visual signal units shall be xenon flasher on an off-white plate/housing with the word "FIRE", shall be ADA compatible, and shall be wall mounted on flush outlet boxes. Mounting height shall be the same as audiovisual signal units. Strobe intensity at each location shall be selected to meet ADA and NFPA 72. Where more than two in a space, units shall flash in synchronization.

M. Provide addressable monitor modules for each power supply for elevator shunt trip breaker coils, and for other equipment as shown. Provide wiring in raceways from monitor modules to the equipment to be monitored. Modules shall communicate any
change in status to the fire alarm control panel ("alarm" for equipment as required by Code, and "trouble" for shunt trip breaker power supplies, and for other equipment as required by Code. ).

N. Provide addressable control modules (with relays as needed) at air handling systems (as hereinbefore indicated), at dampers (as hereinbefore indicated), at door control panels (quantity as required), at elevator controllers (two at each for recall), at elevator shunt trip circuit breakers (one for each), and for other equipment as required by Code. Each control module (or associated relay to be provided) shall have rating (voltage, amperage, etc.) to suit associated equipment to be controlled and each control module shall be both located within 2'-0" of the equipment. Provide wiring in raceways from control modules to the equipment to be controlled. Provide custom programming as required.

O. Provide wall mounted magnetic door hold-open devices in flush outlet boxes. Provide quantity of door hold-open devices as required to properly and securely hold the door open. Provide control modules or, if permitted by code, door control from fire alarm control panel.

P. Fire alarm control panel shall be Notifier NFS-2-640 series, or Edwards System Technology EST-3 series, semi-recessed mounted with battery backup (including charger, transfer switch, and batteries, with 24-hour capacity in standby mode and 5-minute capacity in alarm mode, microprocessor based monitoring and control, 80 character LCD display, 400 event historical logging, point selectable alarm verification feature (alarm verification shall not be programmed at this time), dedicated supervisory service indicator, acknowledge trouble silence reminder (time interval and signal type to be programmable to suit Owner), interface addressable devices (equipped with hardware for 318 analog points and 318 monitor/control points). The quantity and capacity of the addressable interface points shall be as required to meet the limitations of NFPA 72. There shall be one N.O. and one N.C. dry contact that shall change state during any alarm condition. There shall be an RS-232 port for on-site maintenance, another RS-232 port programmed for plug-in of a future printer, and an internal modem with interface assembly for off-site viewing of system status for maintenance. Strobe lights shall flash until all devices are restored to normal and system is reset. Custom labeling and programming shall be provided for proper use of system. Power supplies and batteries shall be sized for 150% capacity for future additions. Where amplifiers, power supplies, and batteries will not fit in fire alarm control panel, they shall be provided in cabinets to be located in closets with locations to be approved. Provide dedicated 120 volt circuits as necessary and identify the location of the circuit disconnecting means at the control panel. A smoke detector shall be provided at each control panel.

Q. Power supply panels shall be provided (in closets) as necessary and shall be provided with batteries and 120V circuits (emergency circuits, when emergency circuits are used for control panel). A smoke detector shall be provided at each power supply panel.
R. An IP type digital alarm communicator transmitter (DACT) shall be provided in the fire alarm control panel except that it shall be located in an I.T. closet when the control panel is semi-recessed in a finished area. It shall be used to transmit system status (for each device in alarm and trouble, simultaneously, to a remote station receiver via a cellular communicator. The cellular communicator shall be similar to Honeywell HWF2V-COM or HWF2A-COM and shall connect directly to the primary and secondary ports of the fire alarm control panel internal DACT. Batteries shall be provided to provide back-up power for the built-in power supply. A hand held programmer shall be provided for ease of programming unit. The communicator shall be installed near the fire alarm control panel. If required due to lack of signal strength, external antenna cables shall be provided at location as directed by Architect. Contractor shall provide programming, make all connections, and provide one year of remote monitoring service of the DACT using the monitoring company selected by the Owner. The system shall allow the Owner in the future, to use another monitoring company who would be able to interface their monitoring facilities with the installed DACT without the Owner incurring additional costs for licensing, reprogramming, etc.; submittal shall indicate this.

S. Programming shall be provided as required.

T. System shall operate in such a way that activation of any pull station, smoke detector, heat detector, or air-stream smoke detector, shall cause all audio and visual signals to operate sonalert to sound until acknowledged by the operator, signal to be transmitted to the remote monitoring system and door hold-open devices to be released. Acknowledgment shall silence sonalert and this operation shall be logged in memory. Operation of the signal silence button shall silence all audible signals and turn off all visual signals) and this operation shall be logged in memory. Audio visual signals shall remain on until the system is reset. A break in an initiating loop, signal loop, monitor or control circuit, wiring to a control circuit, loss of power, failure of any amplifier or oscillator circuit or loss of elevator shunt trip power shall cause a system trouble condition to occur, the system trouble lamps to flash, the sonalert to sound and signal to be transmitted to the remote monitoring system. Acknowledging the trouble condition shall cause the sonalert to be silenced and the trouble LED's to come on steady, and shall be archived in memory. All alarm and trouble conditions shall be archived in the memory by time and date of occurrence. Alarm conditions shall also provide other control functions such as selected HVAC functions and the following:

1. Activation of smoke detectors in elevator lobbies, top of elevator shafts, in hydraulic elevator pits, and elevator machine rooms shall cause elevator primary and alternate floor recall systems to operate (for all elevators associated with the particular lobby, shaft, or machine room in alarm) in accordance with ANSI A17.1b requirements. Contractor shall arrange with and pay all costs for elevator technician to connect the wiring and test the systems.
2. In addition, signals shall be sent to control modules for door control so that doors will be unlocked. Provide programming as required to meet door security system requirements. Contractor shall arrange with and pay all costs for a door security technician to connect from the control modules to door security system junction boxes and provide security system programming as necessary.

PART 3 - EXECUTION

3.1 FIRE ALARM SYSTEM INSTALLATION

A. Wiring shall be provided as necessary for proper system operation and shall be of the type as recommended by system manufacturer. Wiring shall be contained in concealed raceways unless noted otherwise. There shall be minimum of 40% spare analog capacity and 40% spare binary capacity in each data line. Separate audio circuit and strobe circuit shall be provided for each floor and shall have 50% spare capacity for future additions.

B. System shall be installed by a qualified fire alarm technician licensed by the State of Louisiana. Devices shall be individually tested. A final operational test shall be conducted on the entire system. After wiring and construction is completed, system shall be certified by equipment supplier in writing as being complete and properly operating. The certification letter shall include NFPA 72 forms.

C. Contractor shall adjust volume tap on each audible signal unit for proper volume at each location.

D. Contractor shall meet with the Owner to establish name for each device address.

E. Contractor shall meet with the Owner (or security contractor) to properly program as required.

F. Provide 2 spare smoke detectors, 2 spare audiovisual signal units, 2 spare visual signal units, and 2 spare air-stream (duct type) smoke detectors to the Owner.

G. Install 3 additional monitor modules and 3 additional control modules with relays at locations as directed. Connect them to the system and to monitored and controlled devices. At end of construction, any of these modules not used shall be turned over to the Owner.

H. Contractor shall demonstrate proper operation of system to the Engineer (using smoke cans). After system is acceptable to Engineer, Contractor shall contact Fire Marshal and demonstrate system to him, as many times as required.
I. Contractor shall, at the completion of the project, arrange with equipment supplier to train designated Owner personnel in the proper operation, programming and minor maintenance of the system. This shall include training on programming to make changes in device addressing, to make other specified programming changes (to include changes to smoke detector sensitivity settings), and to generate system reports. Training shall be minimum of 4 hours.

J. The completed systems shall be guaranteed free from electrical, mechanical, software, and/or operational defects for a period of one year.

-END OF SECTION -
SECTION 316200 – DRIVEN PILES

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

B. Related Sections:
   1. Section 033000 – Cast-In-Place Concrete

1.2 TESTING LABORATORY SERVICES

C. Permanent Piles: The independent Testing Laboratory specified in “Section 014500” will perform the following services.
   1. Inspection: Perform inspections at source and at project site. Mark conforming piles for identification.
   2. Logging: Log the driving of all piling and record the following:
      a. Date driven, type of hammer, pile description including tip, length and butt dimensions measured just prior to driving.
      b. Location of pile.
      c. Number of blows per foot for full length of pile.
      d. Tip and butt elevation.
      e. Vibration Measurements.
      f. Record control elevations provided by Contractor.
      g. Heaved piles.
   3. Pile load tests.
   4. Reporting: Submit driving records daily.
   5. Inspect pile shells before concreting.

1.3 CONTRACTOR DUTIES

A. Protection of Property: The Contractor shall document the conditions of existing paving, structures, sewers, utilities, and other property on and adjacent to the work site and shall take suitable precautions to protect such property from damage which could result from the piling work. Should damage occur due to Contractor's operations, the Contractor shall repair or replace the damaged work to restore it to its original condition, without additional cost to the Owner.
   1. Documentation: Photograph existing conditions of structures, finishes, equipment, and adjacent improvements that might be construed as damage resulting from pile driving operations. File photos with Architect before starting pile driving.

B. Notification: The Contractor shall notify the Architect and the Testing Laboratory 48 hours prior to driving initial pile. Pile driving must not commence without representatives of the Architect and the Testing Laboratory being present.
C. Regulatory Agency: In accordance with the applicable Building Code, the Contractor shall notify the Director of the responsible regulatory agency at least 24 hours in advance of pile driving.

1.4 SUBMITTALS

A. Splice Data: Submit descriptive data for pile splice connector, including evidence of approval by the responsible regulatory agency.

1.5 QUALITY ASSURANCE

A. Vibration Monitoring: The Owner shall employ and pay an independent agency to monitor the vibrations during the pile driving. Modify operations with the Architect's concurrence as necessary to assure that vibrations are such that adjacent property is not damaged or impaired structurally.

B. Building Code: Comply with applicable provisions of the governing Building Codes.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to Project site in such quantities and at such times to ensure continuity of pile driving operations and adherence to project schedule.

B. Storage: Store piles in orderly groups above ground and blocked to prevent distortion of piles.

C. Handling: Handle piles carefully without dropping, breaking, or abrading the surface. Repair damage or replace with new material.

1.7 PROJECT CONDITIONS

A. Basis for Bids: Bids shall be based on indicated number of piles and dimensions from point to cut-off, plus not less than 1 ft. of extra length for cutting piles at required cut-off elevations.

B. Cost Adjustment: In order to fix the cost to the Owner on longer or shorter piles, if conditions should require change in pile lengths, the Contractor shall submit in his proposal the following unit cost:
   1. Cost per foot in 1'-0" increments for increase or decrease in pile length up to 5'-0".

C. No payment will be made for rejected piles including piles driven out of place, imperfect piles, or piles damaged in driving or handling.

D. Site Information: Data for subsurface conditions is available through the Owner and is not intended as a representation or warranty of continuity of conditions. It is expressly understood that the Owner, the Architect, and the Architect's consultants will not be responsible for interpretations or conclusions drawn by Contractor from the data, which is made available for the information and convenience of Contractor.

E. Protection: Protect structures, utilities, and other improvements and construction from damage caused by pile driving operations.
F. Control: Establish surveyed elevation bench marks on structures where directed by Architect before commencing work when structures are within 10 feet of pile driving operations. Record and report elevation of each bench mark at least twice a day while pile driving is in progress and at completion of driving. If bench mark readings indicate displacement, halt driving operations until corrective action has been provided and is acceptable to Architect.

PART 2 – PRODUCTS

2.1 TREATED TIMBER PILES

A. Piles: Southern Pine smooth peeled conforming to ANSI 05.1 (Class 5) with dimensions as follows:

1. Treated Timber Foundation Piles.
   a. Minimum tip diameter 6".
   b. Minimum butt diameter 8" measured 3'-0" from the end.
   c. Minimum length: as noted on drawings.

B. Preservative Treatment: Comply with AWPA Standards C1 and C3 for foundation piles using Grade 1 creosote (AWPA P1) with a minimum wet retention of 12 lbs. per cu. foot of wood, or CCA with a minimum wet retention of .8 lbs. per cu. foot of wood. Testing of retention by the gauge method will be acceptable.

2.2 DRIVING EQUIPMENT

A. General: Provide pile-driving equipment of type generally used in standard pile driving practice, operated at manufacturer's specified rate, to develop required rated energy per blow.

B. Hammer: Employ pile driving hammers of sufficient capacity, size, and type to be able to deliver consistently effective dynamic energy, suitable to piles to be driven and to sub-grade material into which they are to be driven, when operating at not more than 75 percent efficiency of rated driving energy.

C. Driving Caps: Equip hammer with cast steel or structural steel driving cap conforming to pile shape, to prevent damage to pile during driving.

D. Accessory Equipment: Provide necessary mandrels, drills and other acceptable equipment, suitable for the pile types and driving conditions involved.

PART 3 – EXECUTION

3.1 PRELIMINARY WORK

A. Investigation of Utilities: Investigate locations of underground utilities to identify possible interferences, before starting pile driving. Notify Architect of any interference discovered before or during driving and obtain instructions before proceeding.
B. Site Conditions: Do not drive piles until earthwork in area which piles are to be driven has been completed, as follows:

1. Excavations: Earth excavation shall be stopped at an elevation of 6" to 12" above bottom of footing before piles are driven. Final excavation of footing bottoms shall be done as part of earthwork, after piles have been driven and tested.
2. Fills: Fills will be constructed and compacted to elevation or grade indicated.

3.2 STATIC PILE LOAD TEST – N/A

3.3 STATIC PILE TESTS – N/A

3.4 DRIVING PILES

A. General: Continuously drive piles to elevations or penetration resistance indicated or established by static load testing of piles. Establish and maintain axial alignment of leads and pile before and during driving.

B. Predrilling: Refer to Geotechnical report.

C. Pile Splices: Splices will only be allowed between the timber and steel section of pile.

D. Driving Tolerances: Drive piles without pile heads exceeding the following tolerances:

1. Location: 4 inches from location indicated after initial driving, and 6 inches after pile driving is completed.
2. Plumb: Maintain 1 inch in 10 feet from vertical, or a maximum of 4 inches, measured when pile is above ground in leads.
3. Batter Angle: Maximum 1 inch in 10 feet from required angle, measured when pile is above ground in leads.

E. Withdraw damaged or defective piles and piles that exceed driving tolerances and install new piles within driving tolerances. Fill holes left by withdrawn piles as directed by Construction Manager and Architect/Engineer.

1. Rejected piles may be abandoned and cut off as directed by Construction Manager and Architect/Engineer.
2. Leave rejected piles in place and install new piles in locations as directed by Architect/Engineer.
3. Fill holes left by withdrawn piles that will not be filled by new piles gravel-sand mixtures. Place and compact in lifts not exceeding 72 inches.

F. Cutting Off: Cut off butts of driven piles square with pile axis and at elevations indicated.

G. Driving Record: Maintain accurate driving records for each pile, compiled and attested to by a qualified testing laboratory. Include the following data:

1. Project name and number.
2. Name of Contractor.
3. Pile species.
4. Pile location in pile group and designation of pile group.
5. Pile dimensions.
6. Final tip and cutoff elevations of pile after driving pile group.
7. Records of redriving.
8. Type, make, model, and rated energy of hammer.
9. Weight and stroke of hammer.
10. Cushion material and thickness.
11. Actual stroke and blow rate of hammer.
12. Record of number of blows for each 12 inches of penetration, and number of blows per 1 inch for the last 6 inches of driving.
13. Record preboring, jetting, or special procedures used.
14. Record of unusual occurrences during pile driving.

END OF SECTION 316200
Part 1 – General

1.1 Summary

A. Section includes exterior concrete paving for the following items:
   1. Driveways.
   2. Parking lots.
   3. Concrete curbs.
   4. Sidewalks.

1.2 Action Submittals

A. Product Data: For each type of product.
B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.3 Quality Assurance

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94 requirements for production facilities and equipment.

Part 2 - Products

2.1 Concrete, General

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 Steel Reinforcement

A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064, fabricated from as-drawn steel wire into flat sheets.
C. Reinforcing Bars: ASTM A615, Grade 60; deformed.
D. Joint Dowel Bars: ASTM A615, Grade 60 plain-steel bars. Cut bars true to length with ends square and free of burrs.
E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

2.3 Concrete Materials

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:
   1. Portland Cement: ASTM C150, Type I or Type II.
   2. Fly Ash: ASTM C618, Class F.
      a. Product shall be restricted to suppliers and sources provided on LA DOTD QPL 50.
B. Aggregates: ASTM C33, uniformly graded. Provide aggregates from a single source.
   1. Maximum aggregate size: 1 inch nominal.
Cement Concrete Paving

2.4 Curing Materials

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth.
B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap polyethylene sheet.
C. Water: Potable.
D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
E. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

2.5 Related Materials

A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork in preformed strips.
B. Cold-Applied Joint Sealants:
   1. Type NS Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, non-sag silicone sealant complying with ASTM D5893 for Type NS.
      a. Product shall be restricted to suppliers and sources provided on LA DOTD QPL 42.
   2. Type SL Silicone Sealant for Concrete: Single-component, low-modulus, neutral-curing, self-leveling silicone sealant complying with ASTM D5893 for Type SL.
      a. Product shall be restricted to suppliers and sources provided on LA DOTD QPL 42.
C. Joint-Sealant Backer Materials:
   1. Round Backer Rods for Cold-Applied Sealants: ASTM D5249, Type 3, of diameter and density require to control sealant depths and prevent bottom-side adhesion of sealant.
D. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

2.6 Concrete Mixtures

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.
B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
   1. Fly Ash or Pozzolan: 20 percent.
C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal weight concrete at point of placement having an air content as follows:
   1. Air Content: 4.5 percent plus or minus 1-1/2 percent.
D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
   1. Use water-reducing admixture in concrete as required for placement and workability.
   2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
E. Concrete Mixtures: Normal-weight concrete.
   2. Maximum W/C Ratio at Point of Placement: 0.45.
   3. Slump Limit: 4 inches, plus or minus 1 inch.
2.7 Concrete Mixing

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94. Furnish batch certificates for each batch discharged and used in the Work.

Part 3 - Execution

3.1 Examination

A. Proof-roll prepared subbase surface below areas of proposed concrete pavements in accordance with Specification Section 02300 "Earthwork (Site)" to identify soft pockets and areas of excess yielding.

3.2 Preparation

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 Edge Forms and Screed Construction

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 Steel Reinforcement Installation

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
D. Install welded-wire reinforcement in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.

3.5 Joints

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.
B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.
C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.
D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness.
E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.
3.6 Concrete Placement

A. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.
B. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.
C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
D. Screed paving surface with a straightedge and strike off.
E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.7 Float Finishing

A. General: Do not add water to concrete surfaces during finishing operations.
B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
   1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.

3.8 Concrete Protection and Curing

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
B. Comply with ACI 306.1 for cold-weather protection.
C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these methods.

3.9 Paving Tolerances

A. Comply with tolerances in ACI 117 and as follows:
   1. Elevation: 1/4 inch.
      a. Maximum variations in surface tolerance shall not exceed 1/4 inch in 10 feet.
   3. Joint Spacing: 3 inches.
   5. Joint Width: Plus 1/8 inch, no minus.

3.10 Field Quality Control

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
B. Testing Services: Testing and inspecting of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:
   1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
a. When frequency of testing will provide fewer than five compressive strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C231, pressure method; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.

4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when it is 80 deg F (27 deg C) and above, and one test for each composite sample.

5. Compression Test Specimens: ASTM C31; cast and laboratory cure one set of four standard cylinder specimens for each composite sample. One specimen shall be retained for later testing, if required.

6. Compressive-Strength Tests: ASTM C39; test one specimen at seven days and two specimens at 28 days.
   a. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at 28 days.

C. Strength of each concrete mixture will be satisfactory if average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no individual compressive-strength test value falls below specified compressive strength by more than 500 psi.

D. Test results shall be reported in writing to the Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer.

G. Concrete paving will be considered defective if it does not pass tests and inspections.
   1. Concrete paving that has been determined to be defective shall be replaced at no additional cost to the Owner.

H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

I. Prepare test and inspection reports.

3.11 Repair and Protection

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Architect.

B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

End of Section
32 17 23 Pavement Marking

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.
B. Section 09 90 00 Painting and Coating.

1.2 Summary
A. Section includes painted markings applied to concrete pavement.

1.3 Action Submittals
A. Product Data: For each type of product.
   1. Include technical data and tested physical and performance properties.

1.4 Field Conditions
A. Environmental Limitations: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg F for alkyd materials, 55 deg F for water-based materials, and not exceeding 95 deg F.

Part 2 – Products

2.1 Performance Requirements
A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design", the ABA standards of the Federal agency having jurisdiction, and ICC A117.1.

2.2 Pavement-Marking Paint
A. Pavement-Marking Paint: Alkyd-resin type, lead and chromate free, ready mixed, complying with AASHTO M 248, Type S; colors complying with FS TT-P-1952.
   1. Color: As indicated in the drawings.
   2. Product: See Section 09 90 00 Painting and Coating.
B. Glass Beads: AASHTO M 247, Type 1.
   1. Roundness: Minimum 75 percent true spheres by weight.

Part 3 – Execution

3.1 Examination
A. Verify that pavement is dry and in suitable condition to begin pavement marking according to manufacturer's written instructions.
B. Proceed with pavement marking only after unsatisfactory conditions have been corrected.

3.2 Pavement Marking
A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with Architect.
B. Allow paving to age for a minimum of 30 days before starting pavement marking.
C. Sweep and clean the surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer’s recommended rates to provide a minimum wet film thickness of 15 mils.
   1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to pavement. Mask an extended area beyond edges of each stencil to prevent paint application beyond stencil. Apply paint so that it cannot run beneath the stencil.
   2. Broadcast glass beads uniformly into wet markings at a rate of 6 lb/gal.

3.3 Protecting and Cleaning

A. Protect pavement markings from damage and wear during the remainder of construction period.
B. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

End of Section