

MDOT Use Only

Checked _____

Loaded _____

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03 -



SM No. CSP0210000251

PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

03

Renovation at Hattiesburg U.S. Army Reserve Center, known as State Project No.
SP-0210-00(025) / 101212307 in Forrest County.

Project Completion: 12/23/2016

(STATE DELEGATED)

NOTICE

**BIDDERS MUST PURCHASE A BID PROPOSAL FROM
MDOT CONTRACT ADMINISTRATION DIVISION TO BID
THIS PROJECT.**

Electronic addendum updates will be posted on www.gomdot.com

SECTION 900

OF THE CURRENT

2004 STANDARD SPECIFICATIONS

FOR ROAD AND BRIDGE CONSTRUCTION

JACKSON, MISSISSIPPI

**BIDDER CHECK LIST
(FOR INFORMATION ONLY)**

- _____ First sheet of SECTION 905--PROPOSAL has been completed.
- _____ Second sheet of SECTION 905--PROPOSAL has been completed and signed.
- _____ All unit prices and item totals have been entered in accordance with Subsection 102.06 of the Mississippi Standard Specifications for Road and Bridge Construction.
- _____ Addenda, if any, have been acknowledged. Second sheet of Section 905 listing the addendum number has been substituted for the original second sheet of Section 905. Substituted second sheet of Section 905 has been properly completed, signed, and added to the proposal.
- _____ Proposal bid sheet(s) of SECTION 905--PROPOSAL has been inserted into the proposal package.
- _____ Equal Opportunity Clause Certification, when included in contract, has been completed.
- _____ The Certification regarding Non-Collusion, Debarment and Suspension, etc. has been completed.
- _____ A certified check, cashier's check or bid bond payable to the State of Mississippi in the principal amount of 5% of the bid has been included with project number identified on same. A bid bond has been signed by the bidder and has also been signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent for the Surety with Power of Attorney attached.
- _____ Non-resident Bidders: ON STATE FUNDED PROJECTS ONLY, a copy of the current laws regarding any preference for local Contractors from State wherein domiciled has been included. See Subsection 103.01, Mississippi Standard Specifications for Road and Bridge Construction, and Section 31-7-47, MCA, 1972 regarding this matter.

Return the proposal and contract documents in its entirety in a sealed envelope. **DO NOT** remove any part of the contract documents; exception - an addendum requires substitution of second sheet of Section 905. A stripped proposal is considered as an irregular bid and will be rejected.

Failure to complete any or all of the applicable requirements will be cause for the proposal to be considered irregular.

SECTION 00 01 10 TABLE OF CONTENTS

PROJECT: RENOVATION AT HATTIESBURG US ARMY RESERVE CENTER IN FORREST COUNTY, MISSISSIPPI

PROJECT NUMBER: SP-0210-00(025) 101212

DATE: 6-2-16

DESCRIPTION A: This Work shall consist of minor site work and all construction work necessary to Renovate the Existing Hattiesburg US Army Reserve Center in Forrest County, Mississippi, in accordance with these Specifications and conforming with the Drawings.

It is the intention of these Specifications to provide the necessary items and instruction for a complete building including all code compliance. Omission of items or instruction necessary or considered standard good practice for the proper installation and construction of the building shall not relieve the Contractor of furnishing and installing such items and conforming to the building codes having jurisdiction.

SECTION NUMBER	SECTION TITLE	NO. OF PAGES
	DIVISION 00 PROCUREMENT AND CONTRACTING REQUIREMENTS	
	INTRODUCTORY INFORMATION	
00 01 10	TABLE OF CONTENTS	4
00 01 15	LIST OF DRAWING SHEETS	1
	BIDDING REQUIREMENTS	
00 21 13	INSTRUCTION TO BIDDERS	6
00 22 13	SUPPLEMENTARY INSTRUCTIONS TO BIDDERS	2
00 31 26	EXISTING HAZARDOUS MATERIAL INFORMATION	1
	ASBESTOS INSPECTION REPORT	9
	BUILDING HAT01 DRAWINGS	2
	CONTRACTING REQUIREMENTS	
00 72 00	GENERAL CONDITIONS	1
00 72 00	AIA DOCUMENT A201™ - 2007 AMENDED	44
00 91 13	ADDENDA	1
	DIVISION 01 – GENERAL REQUIREMENTS	
01 10 00	SUMMARY	4
01 25 00	SUBSTITUTION PROCEDURES	5
01 26 00	CONTRACT MODIFICATION PROCEDURES	2
01 29 00	PAYMENT PROCEDURES	4
01 31 00	PROJECT MANAGEMENT AND COORDINATION	8
01 32 00	CONSTRUCTION PROGRESS DOCUMENTATION	3
01 32 33	PHOTOGRAPHIC DOCUMENTATION	2

01 33 00	SUBMITTAL PROCEDURES	10
01 35 16	ALTERATION PROJECT PROCEDURES	5
01 40 00	QUALITY REQUIREMENTS	9
01 42 00	REFERENCES	9
01 45 29	TESTING LABORATORY SERVICES – MDOT	2
01 50 00	TEMPORARY FACILITIES AND CONTROLS	6
01 60 00	PRODUCT REQUIREMENTS	4
01 73 00	EXECUTION	6
01 74 19	CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL	4
01 77 00	CLOSEOUT PROCEDURES	5
01 78 23	OPERATION AND MAINTENANCE DATA	7
01 78 39	PROJECT RECORD DOCUMENTS	3
01 79 00	DEMONSTRATION AND TRAINING	4
01 91 13	GENERAL COMMISSIONING REQUIREMENTS	2
	DIVISION 02 - EXISTING CONDITIONS	
02 41 19	SELECTIVE STRUCTURE DEMOLITION	4
	DIVISION 03 - CONCRETE	
03 10 00	CONCRETE FORMING AND ACCESSORIES	2
03 20 00	CONCRETE REINFORCING	3
03 30 00	CAST-IN-PLACE CONCRETE	5
	DIVISION 04 - MASONRY	
04 01 25	UNIT MASONRY RESTORATION AND CLEANING	5
04 20 00	UNIT MASONRY	6
	DIVISION 05 - METALS	
05 50 00	METAL FABRICATIONS	2
	DIVISION 06 – WOOD AND PLASTIC	
06 10 00	ROUGH CARPENTRY	3
06 40 00	ARCHITECTURAL WOODWORK	4
	DIVISION 07 - THERMAL AND MOISTURE PROTECTION	
07 62 00	SHEET METAL FLASHING AND TRIM	6
07 84 00	FIRESTOPPING	3
07 92 00	JOINT SEALANTS	4

DIVISION 08 – OPENINGS		
08 11 13	HOLLOW METAL DOORS AND FRAMES	6
08 43 13	ALUMINUM-FRAMED STOREFRONT	6
08 71 00	DOOR HARDWARE	15
08 80 00	GLAZING	4
DIVISION 09 - FINISHES		
09 05 15	COLOR DESIGN	2
09 29 00	GYPSUM BOARD	5
09 51 00	ACOUSTICAL CEILINGS	3
09 65 00	RESILIENT FLOORING	4
09 68 13	TILE CARPETING	5
09 90 00	PAINTING AND COATING	11
DIVISION 10 - SPECIALTIES		
10 11 00	VISUAL DISPLAY SURFACES	2
10 14 00	SIGNAGE	3
10 22 13	WIRE MESH PARTITIONS	2
10 44 16	FIRE EXTINGUISHERS	2
DIVISION 11 - EQUIPMENT		
11 31 15	RESIDENTIAL APPLIANCES & EQUIPMENT	1
11 52 13	PROJECTION SCREENS	3
11 52 16	PROJECTORS	2
DIVISION 12 - FURNISHINGS		
12 24 14	ROLLING BLACKOUT SHADES	2
12 48 43	FLOOR MATS	2
DIVISIONS 13 – 21 (NOT USED)		
DIVISION 22 – PLUMBING		
22 01 00	PLUMBING GENERAL PROVISIONS	5
22 05 47	SEISMIC RESTRAINT OF PLUMBING EQUIPMENT AND SUSPENDED UTILITIES	4
22 07 19	PLUMBING INSULATION	4
22 11 16	DOMESTIC WATER PIPING AND VALVES	6
22 13 16	SANITARY WASTE AND VENT PIPING	4
22 42 03	COMMERCIAL PLUMBING FIXTURES	2

	DIVISION 23 HEATING, VENTILATING, AND AIR-CONDITIONING	
23 01 00	GENERAL PROVISIONS OF HVAC SYSTEMS	6
23 05 49	BASIC MATERIALS AND METHODS FOR HVAC	2
23 05 93	TESTING, ADJUSTING AND BALANCING	6
23 07 10	INSULATION	5
23 09 35	CONTROLS – ELECTRIC	5
23 31 10	SHEEL METAL DUCTWORK – LOW PRESSURE	5
23 33 10	SHEEL METAL SPECIALTIES	4
23 81 40	AIR-COOLED SPLIT SYSTEM HEAT PUMP	2
	DIVISIONS 24 – 25 (NOT USED)	
	DIVISION 26 - ELECTRICAL	
26 00 10	GENERAL PROVISIONS	3
26 00 20	CODES AND STANDARDS	1
26 00 30	ELECTRICAL EQUIPMENT / MATERIAL SUBMITTALS	2
26 01 00	BASIC ELECTRICAL MATERIALS AND METHODS	3
26 01 10	RACEWAYS AND FITTINGS	4
26 01 20	BOXES AND ENCLOSURES	3
26 01 30	CONDUCTORS (600V)	3
26 02 50	GROUNDING AND BONDING SYSTEMS	1
26 03 10	PANELBOARDS	2
26 04 10	WIRING DEVICES	
26 04 20	LIGHTING LUMINAIRES	
26 04 50	EQUIPMENT ELECTRICAL SERVICES	
26 05 10	TELECOMMUNICATION RACEWAY SYSTEM	
	DIVISION 27 COMMUNICATIONS	
27 06 00	SPECIAL SYSTEMS	
27 06 20	TELECOMMUNICATIONS HORIZONTAL CABLING SYSTEM	
	DIVISION 28 ELECTRONIC SAFETY AND SECURITY	
28 00 10	SAFETY / SECURITY SYSTEM	
28 00 30	EQUIPMENT / MATERIAL SUBMITTAL	
28 01 10	FIRE DETECTION AND ALARM SYSTEM WITH MASS NOTIFICATION	
	DIVISION 29 – 49 (Not Used)	
	DIVISION 50 MDOT PROCURMENT AND CONTRACTING FORMS	

(REVISIONS TO THE ABOVE WILL BE INDICATED ON THE SECOND SHEET OF SECTION 905 AS ADDENDA)

END OF TABLE OF CONTENTS

SECTION 00 01 15

LIST OF DRAWING SHEETS

PART 1 - GENERAL

1.01 LIST OF DRAWINGS

- A. List of Drawings: Drawings consist of the following Contract Drawings and other drawings of type indicated:

WORKING NUMBER	SHEET NUMBER	DESCRIPTION
----	1	TITLE SHEET
T0	2	INDEX
A111	3	DEMOLITION FLOOR PLAN
A121	4	RENOVATION FLOOR PLAN AND SCHEDULES
A131	5	REFLECTED CEILING PLAN
A551	6	DETAILS
M111	7	HVAC DEMO PLAN
M121	8	HVAC RENOVATION PLAN
MP201	9	MECHANICAL DETAILS
MP301	10	MECHANICAL SCHEDULES
E001	11	ELECTRICAL LEGEND
E100	12	ELECTRICAL DEMOLITION PLAN
E200	13	LIGHTING RENOVATION PLAN
E300	14	POWER / COMMUNICATIONS RENOVATION PLAN
E400	15	ELECTRICAL DETAILS
E401	16	ELECTRICAL DETAILS
E402	17	ELECTRICAL DETAILS
E403	18	ELECTRICAL DETAILS AND RISERS
E404	19	ELECTRICAL DETAILS
E405	20	ELECTRICAL RISERS

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 QUESTIONS

- A. Questions Regarding Bidding: Bidders are advised that all questions that arise regarding the contract documents (proposal) or plans on this project shall be directed to the www.gomdot.com current letting webpage. Click on the call number for this project to open an email form to submit your question. Questions must be submitted by 8:00 a.m. on the day prior to the letting. Answers to questions will be posted by 5:00 p.m. on the Thursday prior to the letting. Answers can be viewed by clicking on Q&A link under the Proposal Addenda column.
- B. It shall be the Bidders responsibility to familiarize themselves with the questions and answers that have been submitted on this project. Bidders are advised that by signing the contract documents for this project, they agree that the on-line Questions and Answers submitted on this project shall be added to and made part of the official contract.

1.02 BIDDER'S QUALIFICATIONS

- A. Prequalification of Bidders: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.01 – Prequalification of Bidders.

1.03 NON-RESIDENT BIDDER

- A. Consideration of Proposals: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 103 – Award and Execution of Contract, Article 103.01 – Consideration of Proposal.

1.04 CONDITIONS OF WORK

- A. Each Bidder must fully inform themselves of all conditions relating to the construction of the Project and employment of labor thereon. Failure to do so will not relieve a successful Bidder of obligations to furnish all material and labor necessary to carry out the provisions of the Contract. Insofar as possible, the Bidder must employ methods, or means, which will not cause interruption of, or interference with, the work of any other Bidder or Contractor.

1.05 EXAMINATION OF PROPOSAL AND SITE

- A. Examination of proposal and Site: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.05 – Examination of Plans, Specifications, Special Provisions, Notice to Bidders and Site Work.

1.06 LAWS AND REGULATIONS

- A. Laws and Regulations: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 107 – Legal Relations and Responsibility to Public, Article 107.01 – Laws to be Observed.

1.07 BID DOCUMENT

- A. The amount for Bid Document (Proposal) is indicated in the advertisement for Bids. Selected plan rooms will be issued one set of documents without charge.

1.08 METHOD OF BIDDING

- A. Lump sum, single bids received on a general contract will include general, mechanical and electrical construction (including Pay Items) and work shown on Drawings or specified in the Project Manual (Proposal).

1.09 PROPOSAL FORMS

- A. Preparation of Proposal: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.06 – Preparation of Proposal (as amended).

1.10 TIME OF COMPLETION

- A. The Bidder shall agree to commence work on a date specified in a written *NOTICE TO PROCEED* and fully complete the Project within the Contract Time indicated on the Proposal Form.

1.11 SUBSTITUTIONS

- A. No substitutions, qualifications or redefining of the Specification requirements are allowed to be marked on the Proposal Form, unless specifically required by the Bid Documents. Refer to Section 01 25 00 entitled Substitution Procedures which covers procedures after the award of Contract.

1.12 ADDENDA

- A. Addenda to the Drawings or Project Manual issued before or during the time of bidding shall be included in the proposal and become a part of the Contract.
- B. If the Proposal, Section 905, does not contain acknowledgement of receipt and addition to the Proposal and Contract Documents of all addenda issued prior to opening of bids will be considered irregular and may be rejected.

1.13 BIDDER IDENTIFICATION

- A. Signature: The Proposal Form shall be signed, by any individual authorized to enter into a binding agreement for the Business making the bid proposal.
- B. Name of Business: The name appearing on the Proposal Form should be complete spelling of bidder's name and address – exact as recorded at the Secretary of State <http://www.sos.state.ms.us/busserv/corp/soskb/csearch.asp> which should be the same as you applied for at the Mississippi Board of Contractors <http://www.msdoc.us/search2.CFM>.
- C. Legal Address: The address appearing on the Proposal Form should be the same address exact as recorded at the Secretary of State <http://www.sos.state.ms.us/busserv/corp/soskb/csearch.asp> which should be the same as you applied for at the Mississippi Board of Contractors <http://www.msdoc.us/search2.CFM>.

- D. Certificate of Responsibility Number(s): The Certificate of Responsibility Number(s) appearing on the Proposal Form should be the same number appearing in the current Mississippi State Board of Contractors Roster.

1.14 BID SECURITY

- A. Proposal Guaranty: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.08 – Proposal Guaranty with the exception that the first and second paragraphs in Subsection 102.08 on page 20 should be deleted and substitute the followings:
 - 1. No proposal will be considered unless accompanied by certified check, cashier's check or bid bond, made payable to the State of Mississippi, in an amount of not less than five percent (5%) of the total amount of the proposal offered. The guaranty shall be evidence of good faith that, if awarded the contract, the bidder will execute the contract and give performance and payment contract bond(s) as stipulated in Subsection 103.05.1, 103.05.2, and as required by law.
 - 2. If a bid bond is offered as guaranty, the bond must be made by a Surety acceptable to the Executive Director and signed or countersigned by a Mississippi Agent or Qualified Nonresident Agent and the Bidder. Such bid bond shall also conform to the requirements and conditions stipulated in Article 103.05.2, applicable

1.15 POWER OF ATTORNEY

- A. Power of Attorney: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 103 – Award and Execution of Contract, Article 103.05 – Requirement of Contract Bond.

1.16 SUBMITTAL

- A. Delivery of Proposals: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.09 – Delivery of Proposal.

1.17 MODIFICATION TO BID

- A. A Bidder may NOT MODIFY the bid prior to the scheduled closing time indicated in the Advertisement for Bids in the following manner:
 - 1. Notification on Envelope: A modification may NOT be written on the outside of the sealed envelope containing the bid.
 - 2. Facsimile: A facsimile (fax) will NOT be acceptable.

1.18 OPENING OF BIDS

- A. Public Opening of Proposal: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.12 – Public Opening of Proposal.

1.19 IRREGULARITIES

- A. Irregular Proposals: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.07 – Irregular Proposal.

1.20 PROTEST

- A. Any protest must be delivered in writing to the Owner prior to the Award Date.

1.21 ERRORS

- A. Any claim of error and request for release from bid must be delivered in writing to the Owner within twenty-four (24) hours after the bid opening. The Bidder shall provide sufficient documentation with the written request clearly proving an error was made.

1.22 AWARD OF CONTRACT

- A. Award of Contract: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 103 – Award and Execution of Contract, Article 103.02 – Award of Contract.
- B. Consideration of Proposal: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 103 – Award and Execution of Contract, Article 103.01 – Consideration of Proposal.

1.23 FAILURE TO ENTER INTO A CONTRACT

- A. Failure to Execute Contract: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 103 – Award and Execution of Contract, Article 103.08 – Failure to Execute Contract.

1.24 SECURITY FOR FAITHFUL PERFORMANCE

- A. Requirements of Contract Bonds: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 103 – Award and Execution of Contract, Article 103.05 – Requirement of Contract Bond.

1.25 BIDDER'S CHECKLIST

- A. Proposal Form:
 - 1. Base Bid:
 - 2. () Fill-in the amount of the base bid in numbers.
 - 3. Certification Form (State Non-Collusion Certificate)
 - 4. () Certification (regarding Non-Collusion, Debarment and Suspension, etc). Form has been executed.
 - 5. Acceptance:
 - 6. () Proposal is signed by authorized person.
 - 7. () Name of Business. - complete spelling of bidder's name and address – exact as recorded at the Secretary of State <http://www.sos.state.ms.us/busserv/corp/soskb/csearch.asp> which should be the same as you applied for at the Mississippi Board of Contractors <http://www.msdoc.us/search2.CFM>.
 - 8. () Legal address of the business listed above (at SOS and Contractor's Board).
 - 9. () Correct Certificate of Responsibility Number(s) as it appears in the current Mississippi State Board of Contractors Roster.
 - 10. Certificate of Responsibility Number(s):
 - 11. () Base Bid is under \$50,000 and no number is required.
 - 12. () Base Bid is under \$50,000 and the statement "bid does not exceed \$50,000" is on the outside of the sealed envelope.
 - 13. () Base Bid is equal to or over \$50,000 and number is required.
 - 14. () Joint Venture and *joint venture* number is required.

- 15. Or
- 16. () Joint Venture participants' numbers are required.

B. Bid Security

- 1. Bid Bond:
- 2. () Included Bid Bond payable to the STATE OF MISSISSIPPI with Project number identified thereon,
- 3. Or
- 4. () Included Certified Check payable to the STATE OF MISSISSIPPI with Project number identified thereon.
- 5. Power of Attorney:
- 6. () Included Power of Attorney.

C. Non-Resident Bidder

- 1. Preference Law:
- 2. () Attached a Copy of Non-Resident Bidder's Preference Law.
- 3. Or
- 4. () Attached a Statement.

D. Subcontractors' Name

- 1. Subcontractor:
- 2. () List Mechanical, Plumbing, and/or Electrical Subcontractor regardless of cost.
 * List name even for under \$50,000.
 * Fire Protection Sprinkler Contractors do not have to be listed.
 * If there is a separate HVAC / Plumbing Sub-Contractor, so notate as mentioned herein.
 * If Mechanical, Plumbing, and / or Electrical Subcontractor is performed by the General Contractor, be sure the General has COR for said discipline.
 * If there is no Mechanical, Plumbing, and / or Electrical Sub-Contractor listed, then use of Sub-Contractor to perform such scope will not be permitted.

E. Subcontractors' COR Number

- 1. Certificate of Responsibility
- 2. () List certificate of responsibility Number for all listed Sub-Contractors over \$50,000.
- 3. * If under \$50,000 – so notate on the COR line “under \$50,000” (or can still show COR Number)

1.26 BIDDER'S CONTACT LIST

- A. Proposal and Contract Documents: If the Bidder has any questions pertaining to the following specific areas of the Documents, please direct them to the following individuals:

Additional Proposals:	Neal Dougherty – Contract Administration	(601) 359-7700
Additional Prints:	Nathan Bruce – MDOT Plans Print Shop	(601) 359-7459
Bid Forms:	Billy Owen – Contract Admin. Engineer	(601) 359-7730
Specifications:	Earl Glenn – Assist. Construction Engr.	(601) 359-7301
Drawings:	Earl Glenn – Assist. Construction Engr.	(601) 359-7301

Bidder's List & Specimen Proposals are available online at:
<http://www.gomdot.com/Applications/BidSystem/Home.aspx>

- B. For potential contractors that may bid on this Project, access to the facility needs to be coordinated with SFC Monica Buck. Below is her point of contact information.

Monica R. Buck
SFC, AGR
Battalion S-4
Battalion S-3
Facility Coordinator
Phone: 601-544-8836
Email: monica.r.buck.mil@mail.mil

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 00 22 13

SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 INSTRUCTIONS TO BIDDERS

- A. Instructions to Bidders for Project consist of the following:

1.02 WORK IN PROXIMITY OF HIGH VOLTAGE POWER LINES

- A. Contractor's Responsibility for Utility Property and Services: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 107 – Legal Relations and Responsibility to Public, Article 107.18 – Contractor's Responsibility for Utility Property and services.

1.03 PLANT PEST QUARANTINES INFORMATION

- A. Quarantine Information: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 107 – Legal Relations and Responsibility to Public, Article 107.22.7 – Quarantine Information.

1.04 PROMPT PAYMENT

- A. General: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 108 – Prosecution and Progress, Article 108.01.1 – General.

1.05 ALTERATIONS IN BIDDING PROCESS

- A. Preparation of Proposal: Refer to Mississippi Standard Specifications for Road and Bridge Construction 2004 Edition Section 102 – Bidding Requirements and Conditions, Article 102.06 – Preparation of Proposal.

1.06 CONTRACT TIME

- A. It is anticipated that the Notice to Award will be issued by not later than August 9, 2016 and the date for Notice to Proceed and Beginning of Contract Time will be simultaneous with Execution of Contract.
- B. The calendar date for completion of this Contract shall be December 23, 2016 which date or extended date as provided in Article 8 – TIME shall be the end of Contract Time.
- C. A Construction Schedule as described in Section 01 32 00-Construction Progress Documentation of these Specifications will be required.

1.07 SUBCONTRACTING

The Bidder is specifically advised that any person, firm or other party to whom it proposes to award a subcontract must be acceptable to the Owner. The total allowable subcontract amount shall not exceed **sixty percent (60%) of the Contract Sum**, excluding the value of any "Specialty Items" listed below:

1. Plumbing Items
2. Heating, Ventilating and Air Conditioning Items
3. Electrical Items

These items are not to be confused with Division 10 – Specialties of the Specifications.

END OF SECTION

SECTION 00 31 26

EXISTING HAZARDOUS MATERIAL INFORMATION

1.1 EXISTING HAZARDOUS MATERIAL INFORMATION

- A. This Document with its referenced attachments is part of the Procurement and Contracting Requirements for Project. They provide Owner's information for Bidders' convenience and are intended to supplement rather than serve in lieu of Bidders' own investigations. They are made available for Bidders' convenience and information, but are not a warranty of existing conditions. This Document and its attachments are not part of the Contract Documents.
- B. An existing asbestos report for Project, prepared by ALPHA Facilities Solutions, LLC, dated July 2015, is available for viewing as appended to this Document.
- C. Related Requirements:
 - 1. Section 02 41 19 "Selective Structure Demolition" for notification requirements if materials suspected of containing hazardous materials are encountered.

END OF SECTION

Asbestos Inspection Report



Hattiesburg USARC
Site Code: 28780
36 Academy Road
Hattiesburg, MS 39401-7958



Prepared for:
81st Regional Support Command
Directorate of Public Works
81 Wildcat Way
Fort Jackson, SC 29207-6907
(803) 751-9947



Under Contract with:
U.S. Army Corps of Engineers, Mobile District



Prepared by:
ALPHA Facilities Solutions, LLC
11503 NW Military Highway Suite 300
San Antonio, TX 78230-5847
210-492-5742
Inspected by: Mark F. Spence and Alex Grey

July 2015

Inspection Date: 28 January 2015

2015 Asbestos Inspection Report
Hattiesburg USARC

Building HAT01 (MS005): USAR CENTER

8,393 SF

Building HAT01 is a concrete block structure with brick exterior and flat asphaltic roof. Floor finishes used include exposed concrete, carpet, resilient and ceramic tile. Walls are wallboard and concrete block. Ceilings are exposed structure, ceiling board and suspended tile.



2015 Asbestos Inspection Report
Hattiesburg USARC

Building HAT01 (MS005): Data Tables of ACM and Non-ACM



Table D-1 - Summary of Asbestos-Containing Materials for Hattiesburg USARC (28780)

Bldg. No. (MS005)	Mater. ID No. (MS005)	Material Description	AHERA CAT	Locations	Quantity	Sample Information		Friable	Overall Condition	Type of Damage	Accessibility	Potential for Air Erosion	Potential for Vibration	Potential for Damage	EPA ALCAT	Recommended Management Actions	Comments
						Number	Date										
Building: HAT01 (MS005)																	
HAT01 (MS005)	005	INTERIOR, CAULK, GRAY, ON VENT DUCTS	MISC.	101, 103, 105, 106, 108, 110, 111, 113, 123, 124, 125, 126	730 LF	Hattiesburg-007 Hattiesburg-008	12-Oct-02 12-Oct-02	NO	UNDAMAGED	NONE	HIGH	LOW	LOW	SIGNIFICANT POTENTIAL	6	1. NO IMMEDIATE ABATEMENT REQUIRED. 2. CONSULT THE O&M MANUAL CONCERNING SAFE CUSTODIAL PROCEDURES FOR THIS MATERIAL. 3. CONTINUE SURVEILLANCE OF THIS MATERIAL UNDER THE ASBESTOS MANAGEMENT PLAN.	
HAT03 (MS005)	030	FIRE DOOR LINING, INACCESSIBLE CORE, 1-1/2" THICK, IRON, UNFINISHED, METAL FRUIT VAULT DOOR	MISC.	114	1 EA.	ASSUMED ACH	26-Jan-15	NO	UNDAMAGED	NONE	LOW	LOW	LOW	LOW POTENTIAL	8	1. NO IMMEDIATE ABATEMENT REQUIRED. 2. CONSULT THE O&M MANUAL CONCERNING SAFE CUSTODIAL PROCEDURES FOR THIS MATERIAL. 3. CONTINUE SURVEILLANCE OF THIS MATERIAL UNDER THE ASBESTOS MANAGEMENT PLAN.	THIS MATERIAL WAS NOT ACCESSIBLE FOR ADEQUATE INSPECTION BECAUSE THERE IS NO ACCESS TO CORE.
HAT02 (MS005)	021	FIRE DOOR LINING, INACCESSIBLE CORE, 1-1/2" THICK, METAL SECOND VAULT DOOR	MISC.	114	1 EA.	ASSUMED ACH	28-Jan-15	NO	UNDAMAGED	NONE	LOW	LOW	LOW	LOW POTENTIAL	8	1. NO IMMEDIATE ABATEMENT REQUIRED. 2. CONSULT THE O&M MANUAL CONCERNING SAFE CUSTODIAL PROCEDURES FOR THIS MATERIAL. 3. CONTINUE SURVEILLANCE OF THIS MATERIAL UNDER THE ASBESTOS MANAGEMENT PLAN.	THIS MATERIAL WAS NOT ACCESSIBLE FOR ADEQUATE INSPECTION BECAUSE THERE IS NO ACCESS TO CORE.

Table D-2 - Summary of Non-Asbestos Materials for Hattiesburg USARC (28780)

Bldg. No.	Homo. Mat. No.	Material Description	AHERA CAT	Locations	Sample Information			Comments
					Number	Date	Result	
Building: HAT01 (MS005)								
HAT01 (MS005)	001	RESILIENT FLOOR TILE, 1' X 1' CREAM WITH BROWN AND WHITE STREAKS	MISC.	111, 113, 123	Hatysbrg-001 Hatysbrg-002	12-Oct-02 12-Oct-02	ND ND	THE ADHESIVE FOR THIS MATERIAL IS MN 002.
HAT01 (MS005)	002	FLOOR ADHESIVE, YELLOW, UNDER 1' X 1' CREAM WITH BROWN AND WHITE STREAKS RESILIENT FLOOR TILE	MISC.	111, 113, 123	Hatysbrg-001 Hatysbrg-002 MS15-HAT-002A MS15-HAT-002B	12-Oct-02 12-Oct-02 28-Jan-15 28-Jan-15	ND ND ND ND	THIS IS THE ADHESIVE FOR MN 001.
HAT01 (MS005)	003	JOINT COMPOUND, WHITE	MISC.	106, 109, 120, 121, 128	Hatysbrg-003 Hatysbrg-004	12-Oct-02 12-Oct-02	ND ND	THIS IS THE JOINT COMPOUND FOR MN 037.
HAT01 (MS005)	004	CEILING TILES, 2' X 2' WHITE, PINHOLE, FISSURED, SUSPENDED	MISC.	101, 103, 105, 106, 109, 110, 111, 118, 123, 124, 125, 126	Hatysbrg-005 Hatysbrg-006	12-Oct-02 12-Oct-02	ND ND	
HAT01 (MS005)	005	WALL PLASTER, WHITE, SMOOTH SURFACE	SURF.	118, 120, 121, 122	Hatysbrg-009 Hatysbrg-010 Hatysbrg-011	12-Oct-02 12-Oct-02 12-Oct-02	ND ND ND	
HAT01 (MS005)	024	THERMAL FITTING INSULATION, WHITE PLASTER COVER, YELLOW FIBERGLASS CORE	TSI	115, 122	MS15-HAT-024A MS15-HAT-024B MS15-HAT-024C	28-Jan-15 28-Jan-15 28-Jan-15	ND ND ND	
HAT01 (MS005)	025	THERMAL PIPE INSULATION, 4" DIAMETER, WHITE PAPER COVER, YELLOW FIBERGLASS CORE	TSI	115, 122	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	026	FLEX CONNECTOR, PAINTED, BLACK RUBBER	MISC.	115	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	027	INTERIOR CAULK, GRAY SURFACE, GREEN CORE, WALL EXPANSION JOINT	MISC.	115	MS15-HAT-027A MS15-HAT-027B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	028	INTERIOR CAULK, BROWN, FLOOR EXPANSION JOINT	MISC.	115, 122	MS15-HAT-028A MS15-HAT-028B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	029	FIRE DOOR LINING, YELLOW FIBERGLASS CORE, TAN, PAINTED, METAL, DOUBLE DOORS WITH ONE SQUARE FOOT REINFORCED WINDOW	MISC.	111, 112, 115, 123	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	032	SINK COATING, CEMENTITIOUS, WHITE ROUGH SURFACE, UNDER STAINLESS STEEL DOUBLE BOWL, SET IN WHITE LAMINATED COUNTERTOP	MISC.	118	MS15-HAT-032A MS15-HAT-032B	28-Jan-15 28-Jan-15	ND ND	

Table D-2 - Summary of Non-Asbestos Materials for Hattiesburg USARC (28780)

Bldg. No.	Homo. Mtd. No.	Material Description	AHERA CAT	Locations	Sample Information			Comments
					Number	Date	Result	
HAT01 (MS005)	033	TILE GROUT, GRAY, ASSOCIATED WITH 6" X 6" BROWN CERAMIC FLOOR TILE	MISC.	118	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	034	COVE BASE ADHESIVE, TAN, UNDER 4" BROWN RUBBER COVE BASE	MISC.	111, 113, 123	MS15-HAT-034A MS15-HAT-034B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	035	TILE GROUT, GRAY, ASSOCIATED WITH 3" X 3" TAN CERAMIC WALL TILE	MISC.	120	MS15-HAT-035A MS15-HAT-035B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	036	TILE GROUT, GRAY, ASSOCIATED WITH 1" X 1" TAN CERAMIC FLOOR TILE	MISC.	120	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	037	CEILING BOARD, 1/2" THICK, WHITE SURFACE, WHITE CORE, GREEN PAPER BACKING	MISC.	106, 109, 120, 121, 128	MS15-HAT-037A MS15-HAT-037B	28-Jan-15 28-Jan-15	ND ND	THE JOINT COMPOUND FOR THIS MATERIAL IS MN 003.
HAT01 (MS005)	038	FLOOR ADHESIVE, YELLOW, UNDER BLACK CARPET SQUARES	MISC.	101	MS15-HAT-038A MS15-HAT-038B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	039	INTERIOR CAULK, WHITE, ON TOILET FIXTURES	MISC.	121, 128	MS15-HAT-039A MS15-HAT-039B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	040	DUCT INSULATION, FOIL COVER, YELLOW FIBERGLASS CORE	TSI	111, 120, 121, 122, 123, 128	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	041	VAPOR BARRIER, GRAY, BETWEEN BRICK WALL AND CONCRETE FOUNDATION	MISC.	X100	MS15-HAT-041A MS15-HAT-041B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	042	DOOR FRAME CAULK, GRAY, CEMENTITIOUS, AT BROWN, PAINTED, METAL, DOUBLE DOORS	MISC.	X100	MS15-HAT-042A MS15-HAT-042B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	043	THERMAL PIPE & FITTING INSULATION, 4"-6" BLACK RUBBER, ON EXTERIOR MECHANICAL UNIT	TSI	X100	NO SAMPLE TAKEN	28-Jan-15	NON-SUSPECT	THIS MATERIAL IS NOT A SUSPECTED ACM AND THEREFORE WAS NOT SAMPLED.
HAT01 (MS005)	044	WINDOW GLAZING, PALE YELLOW, ON TWO PANE SYSTEM	MISC.	X100	MS15-HAT-044A MS15-HAT-044B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	045	WINDOW FRAME CAULK, DARK GRAY PUTTY, ON TWO PANE SYSTEM	MISC.	X100	MS15-HAT-045A MS15-HAT-045B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	046	EXTERIOR CAULK, BLACK, PERIMETER	MISC.	X100	MS15-HAT-046A MS15-HAT-046B	28-Jan-15 28-Jan-15	ND ND	

Table D-2 - Summary of Non-Asbestos Materials for Hattiesburg USARC (28780)

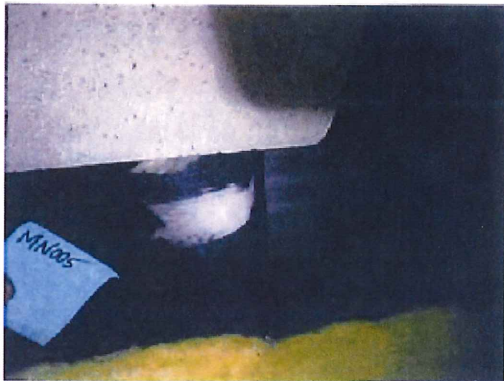
Bldg. No.	Homo. Mtl. No.	Material Description	AHERA CAT	Locations	Sample Information			Comments
					Number	Date	Result	
HAT01 (MS005)	047	EXTERIOR CAULK, GRAY, WALL EXPANSION JOINT	MISC.	X100	MS15-HAT-047A MS15-HAT-047B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	048	ROOFING SYSTEM, GRAY GRANULATED SURFACE, BLACK ASPHALTIC CORE, ROLLED, MODIFIED BITUMEN	MISC.	R100, R101	MS15-HAT-048A MS15-HAT-048B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	049	ROOF FLASHING, GRAY SURFACE, BLACK CORE, ON PARAPET AND EQUIPMENT	MISC.	R100, R101	MS15-HAT-049A MS15-HAT-049B	28-Jan-15 28-Jan-15	ND ND	
HAT01 (MS005)	050	EXTERIOR CAULK, BROWN, ON METAL FLASHING TO BRICK WALL AND ON MECHANICAL EQUIPMENT	MISC.	R100	MS15-HAT-050A MS15-HAT-050B	28-Jan-15 28-Jan-15	ND ND	

Table D-3 - Summary of Other Materials for Hattiesburg USARC (28780)

Bldg. No.	Homo. MH. No.	Material Description	AHERA CAT	Locations	Sample Information			Comments
					Number	Date	Result	
Building: HAT01 (MS005)								
HAT01 (MS005)	007	RESILIENT FLOOR TILE, 9" X 9" WHITE WITH GRAY STREAKS	MISC.	120	Hatysbrg-012 Hatysbrg-013	12-Oct-02 12-Oct-02	CH 5% CH 5%	DURING THE 2015 ASBESTOS INSPECTION, THIS PREVIOUSLY IDENTIFIED MATERIAL COULD NOT BE LOCATED. THE ADHESIVE FOR THIS MATERIAL IS MN 008.
HAT01 (MS005)	008	FLOOR ADHESIVE, BLACK, UNDER 9" X 9" WHITE WITH GRAY STREAKS RESILIENT FLOOR TILE	MISC.	120	Hatysbrg-012 Hatysbrg-013	12-Oct-02 12-Oct-02	CH 5% CH 5%	DURING THE 2015 ASBESTOS INSPECTION, THIS PREVIOUSLY IDENTIFIED MATERIAL COULD NOT BE LOCATED. THIS IS THE ADHESIVE FOR MN 007.

2015 Asbestos Inspection Report
Hattiesburg USARC

Building HAT01 (MS005): Photos of ACM



Material 005, Interior Caulk, Gray, On Vent Ducts



Material 030, Fire Door Lining, Inaccessible Core, 1-1/2" Thick, Tan, Painted, Metal First Vault Door



Material 031, Fire Door Lining, Inaccessible Core, 1-1/2" Thick, Metal Second Vault Door



SECTION 00 72 00

GENERAL CONDITIONS

PART 1 - GENERAL

1.01 DESCRIPTION.

- A. The American Institute of Architects AIA DOCUMENT A201-2007, "General Conditions of the Contract for Construction", 2007, Sixteenth Edition, Articles 1 through 15 inclusive, except as may be added to or modified herein, is hereby made a part of the Contract Documents. For brevity, AIA DOCUMENT A201-2007 is also referred to in the Contract documents as the "General Conditions".
- B. All persons intending to provide goods or services in connection with this Work are required to read and understand the referenced document prior to proceeding.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION



AIA[®]

Document A201[™] – 2007

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

RENOVATION AT HATTIESBURG US ARMY RESERVE CENTER IN FORREST COUNTY, MISSISSIPPI

SP00210-00(025) 101212

THE OWNER:

(Name, legal status and address)

MISSISSIPPI TRANSPORTATION COMMISSION
P O BOX 1850
JACKSON, MISSISSIPPI 39215-1850

THE ARCHITECT:

(Name, legal status and address)

TABLE OF ARTICLES

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

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

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

Init.

User Notes:

14 TERMINATION OR SUSPENSION OF THE CONTRACT

15 CLAIMS AND DISPUTES



Init.

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INDEX

(Topics and numbers in bold are section headings.)

Acceptance of Nonconforming Work

9.6.6, 9.9.3, **12.3**

Acceptance of Work

9.6.6, 9.8.2, 9.9.3, 9.10.1, 9.10.3, 12.3

Access to Work

3.16, 6.2.1, 12.1

Accident Prevention

10

Acts and Omissions

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

Addenda

1.1.1, 3.11.1

Additional Costs, Claims for

3.7.4, 3.7.5, 6.1.1, 7.3.7.5, 10.3, 15.1.4

Additional Inspections and Testing

9.4.2, 9.8.3, 12.2.1, **13.5**

Additional Insured

11.1.4

Additional Time, Claims for

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

Administration of the Contract

3.1.3, **4.2**, 9.4, 9.5

Advertisement or Invitation to Bid

1.1.1

Aesthetic Effect

4.2.13

Allowances

3.8, 7.3.8

All-risk Insurance

11.3.1, 11.3.1.1

Applications for Payment

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

Approvals

2.1.1, 2.2.2, 2.4, 3.1.3, 3.10.2, 3.12.8, 3.12.9, 3.12.10, 4.2.7, 9.3.2, 13.5.1

Arbitration

8.3.1, 11.3.10, 13.1.1, 15.3.2, **15.4**

ARCHITECT

4

Architect, Definition of

4.1.1

Architect, Extent of Authority

2.4.1, 3.12.7, 4.1, 4.2, 5.2, 6.3, 7.1.2, 7.3.7, 7.4, 9.2, 9.3.1, 9.4, 9.5, 9.6.3, 9.8, 9.10.1, 9.10.3, 12.1, 12.2.1, 13.5.1, 13.5.2, 14.2.2, 14.2.4, 15.1.3, 15.2.1

Architect, Limitations of Authority and

Responsibility

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

Architect's Additional Services and Expenses

2.4.1, 11.3.1.1, 12.2.1, 13.5.2, 13.5.3, 14.2.4

Architect's Administration of the Contract

3.1.3, 4.2, 3.7.4, 15.2, 9.4.1, 9.5

Architect's Approvals

2.4.1, 3.1.3, 3.5, 3.10.2, 4.2.7

Architect's Authority to Reject Work

3.5, 4.2.6, 12.1.2, 12.2.1

Architect's Copyright

1.1.7, 1.5

Architect's Decisions

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

Architect's Inspections

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

Architect's Instructions

3.2.4, 3.3.1, 4.2.6, 4.2.7, 13.5.2

Architect's Interpretations

4.2.11, 4.2.12

Architect's Project Representative

4.2.10

Architect's Relationship with Contractor

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

Architect's Relationship with Subcontractors

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

Architect's Representations

9.4.2, 9.5.1, 9.10.1

Architect's Site Visits

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

Asbestos

10.3.1

Attorneys' Fees

3.18.1, 9.10.2, 10.3.3

Award of Separate Contracts

6.1.1, 6.1.2

Award of Subcontracts and Other Contracts for Portions of the Work

5.2

Basic Definitions

1.1

Bidding Requirements

1.1.1, 5.2.1, 11.4.1

Binding Dispute Resolution

9.7, 11.3.9, 11.3.10, 13.1.1, 15.2.5, 15.2.6.1, 15.3.1, 15.3.2, 15.4.1

Boiler and Machinery Insurance

11.3.2

Bonds, Lien

7.3.7.4, 9.10.2, 9.10.3

Bonds, Performance, and Payment

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

Init.

Building Permit
3.7.1

Capitalization 1.3

Certificate of Substantial Completion
9.8.3, 9.8.4, 9.8.5

Certificates for Payment

4.2.1, 4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7,
9.10.1, 9.10.3, 14.1.1.3, 14.2.4, 15.1.3

Certificates of Inspection, Testing or Approval
13.5.4

Certificates of Insurance
9.10.2, 11.1.3

Change Orders

1.1.1, 2.4.1, 3.4.2, 3.7.4, 3.8.2.3, 3.11.1, 3.12.8, 4.2.8,
5.2.3, 7.1.2, 7.1.3, **7.2**, 7.3.2, 7.3.6, 7.3.9, 7.3.10,
8.3.1, 9.3.1.1, 9.10.3, 10.3.2, 11.3.1.2, 11.3.4, 11.3.9,
12.1.2, 15.1.3

Change Orders, Definition of

7.2.1

CHANGES IN THE WORK

2.2.1, 3.11, 4.2.8, **7**, 7.2.1, 7.3.1, 7.4, 8.3.1, 9.3.1.1,
11.3.9

Claims, Definition of

15.1.1

CLAIMS AND DISPUTES

3.2.4, 6.1.1, 6.3, 7.3.9, 9.3.3, 9.10.4, 10.3.3, **15**, 15.4
Claims and Timely Assertion of Claims
15.4.1

Claims for Additional Cost

3.2.4, 3.7.4, 6.1.1, 7.3.9, 10.3.2, **15.1.4**

Claims for Additional Time

3.2.4, 3.7.46.1.1, 8.3.2, 10.3.2, **15.1.5**

**Concealed or Unknown Conditions, Claims for
3.7.4**

Claims for Damages

3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1,
11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6

Claims Subject to Arbitration

15.3.1, 15.4.1

Cleaning Up

3.15, 6.3

Commencement of the Work, Conditions Relating to
2.2.1, 3.2.2, 3.4.1, 3.7.1, 3.10.1, 3.12.6, 5.2.1, 5.2.3,
6.2.2, 8.1.2, 8.2.2, 8.3.1, 11.1, 11.3.1, 11.3.6, 11.4.1,
15.1.4

Commencement of the Work, Definition of

8.1.2

Communications Facilitating Contract

Administration

3.9.1, **4.2.4**

Completion, Conditions Relating to

3.4.1, 3.11, 3.15, 4.2.2, 4.2.9, 8.2, 9.4.2, 9.8, 9.9.1,
9.10, 12.2, 13.7, 14.1.2

COMPLETION, PAYMENTS AND

9

Completion, Substantial

4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, 9.8, 9.9.1, 9.10.3,
12.2, 13.7

Compliance with Laws

1.6.1, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4,
10.2.2, 11.1, 11.3, 13.1, 13.4, 13.5.1, 13.5.2, 13.6,
14.1.1, 14.2.1.3, 15.2.8, 15.4.2, 15.4.3

Concealed or Unknown Conditions

3.7.4, 4.2.8, 8.3.1, 10.3

Conditions of the Contract

1.1.1, 6.1.1, 6.1.4

Consent, Written

3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1,
9.10.2, 9.10.3, 11.3.1, 13.2, 13.4.2, 15.4.4.2

Consolidation or Joinder

15.4.4

CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

1.1.4, **6**

Construction Change Directive, Definition of

7.3.1

Construction Change Directives

1.1.1, 3.4.2, 3.12.8, 4.2.8, 7.1.1, 7.1.2, 7.1.3, **7.3**,
9.3.1.1

Construction Schedules, Contractor's

3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2

Contingent Assignment of Subcontracts

5.4, 14.2.2.2

Continuing Contract Performance

15.1.3

Contract, Definition of

1.1.2

CONTRACT, TERMINATION OR SUSPENSION OF THE

5.4.1.1, 11.3.9, **14**

Contract Administration

3.1.3, 4, 9.4, 9.5

Contract Award and Execution, Conditions Relating
to

3.7.1, 3.10, 5.2, 6.1, 11.1.3, 11.3.6, 11.4.1

Contract Documents, Copies Furnished and Use of
1.5.2, 2.2.5, 5.3

Contract Documents, Definition of

1.1.1

Contract Sum

3.7.4, 3.8, 5.2.3, 7.2, 7.3, 7.4, **9.1**, 9.4.2, 9.5.1.4,
9.6.7, 9.7, 10.3.2, 11.3.1, 14.2.4, 14.3.2, 15.1.4,
15.2.5

Contract Sum, Definition of

9.1

Contract Time

3.7.4, 3.7.5, 3.10.2, 5.2.3, 7.2.1.3, 7.3.1, 7.3.5, 7.4,
8.1.1, 8.2.1, 8.3.1, 9.5.1, 9.7, 10.3.2, 12.1.1, 14.3.2,
15.1.5.1, 15.2.5

Contract Time, Definition of

8.1.1

Init.

CONTRACTOR

3

Contractor, Definition of

3.1, 6.1.2

Contractor's Construction Schedules

3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2

Contractor's Employees

3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1

Contractor's Liability Insurance

11.1

Contractor's Relationship with Separate Contractors and Owner's Forces

3.12.5, 3.14.2, 4.2.4, 6, 11.3.7, 12.1.2, 12.2.4

Contractor's Relationship with Subcontractors

1.2.2, 3.3.2, 3.18.1, 3.18.2, 5, 9.6.2, 9.6.7, 9.10.2, 11.3.1.2, 11.3.7, 11.3.8

Contractor's Relationship with the Architect

1.1.2, 1.5, 3.1.3, 3.2.2, 3.2.3, 3.2.4, 3.3.1, 3.4.2, 3.5, 3.7.4, 3.10, 3.11, 3.12, 3.16, 3.18, 4.1.3, 4.2, 5.2, 6.2.2, 7, 8.3.1, 9.2, 9.3, 9.4, 9.5, 9.7, 9.8, 9.9, 10.2.6, 10.3, 11.3.7, 12, 13.5, 15.1.2, 15.2.1

Contractor's Representations

3.2.1, 3.2.2, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.8.2

Contractor's Responsibility for Those Performing the Work

3.3.2, 3.18, 5.3.1, 6.1.3, 6.2, 9.5.1, 10.2.8

Contractor's Review of Contract Documents

3.2

Contractor's Right to Stop the Work

9.7

Contractor's Right to Terminate the Contract

14.1, 15.1.6

Contractor's Submittals

3.10, 3.11, 3.12.4, 4.2.7, 5.2.1, 5.2.3, 9.2, 9.3, 9.8.2, 9.8.3, 9.9.1, 9.10.2, 9.10.3, 11.1.3, 11.4.2

Contractor's Superintendent

3.9, 10.2.6

Contractor's Supervision and Construction

Procedures

1.2.2, 3.3, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.5, 7.3.7, 8.2, 10, 12, 14, 15.1.3

Contractual Liability Insurance

11.1.1.8, 11.2

Coordination and Correlation

1.2, 3.2.1, 3.3.1, 3.10, 3.12.6, 6.1.3, 6.2.1

Copies Furnished of Drawings and Specifications

1.5, 2.2.5, 3.11

Copyrights

1.5, 3.17

Correction of Work

2.3, 2.4, 3.7.3, 9.4.2, 9.8.2, 9.8.3, 9.9.1, 12.1.2, 12.2

Correlation and Intent of the Contract Documents

1.2

Cost, Definition of

7.3.7

Costs

2.4.1, 3.2.4, 3.7.3, 3.8.2, 3.15.2, 5.4.2, 6.1.1, 6.2.3, 7.3.3.3, 7.3.7, 7.3.8, 7.3.9, 9.10.2, 10.3.2, 10.3.6, 11.3, 12.1.2, 12.2.1, 12.2.4, 13.5, 14

Cutting and Patching

3.14, 6.2.5

Damage to Construction of Owner or Separate Contractors

3.14.2, 6.2.4, 10.2.1.2, 10.2.5, 10.4, 11.1.1, 11.3, 12.2.4

Damage to the Work

3.14.2, 9.9.1, 10.2.1.2, 10.2.5, 10.4.1, 11.3.1, 12.2.4

Damages, Claims for

3.2.4, 3.18, 6.1.1, 8.3.3, 9.5.1, 9.6.7, 10.3.3, 11.1.1, 11.3.5, 11.3.7, 14.1.3, 14.2.4, 15.1.6

Damages for Delay

6.1.1, 8.3.3, 9.5.1.6, 9.7, 10.3.2

Date of Commencement of the Work, Definition of

8.1.2

Date of Substantial Completion, Definition of

8.1.3

Day, Definition of

8.1.4

Decisions of the Architect

3.7.4, 4.2.6, 4.2.7, 4.2.11, 4.2.12, 4.2.13, 15.2, 6.3, 7.3.7, 7.3.9, 8.1.3, 8.3.1, 9.2, 9.4, 9.5.1, 9.8.4, 9.9.1, 13.5.2, 14.2.2, 14.2.4, 15.1, 15.2

Decisions to Withhold Certification

9.4.1, 9.5, 9.7, 14.1.1.3

Defective or Nonconforming Work, Acceptance, Rejection and Correction of

2.3.1, 2.4.1, 3.5, 4.2.6, 6.2.5, 9.5.1, 9.5.2, 9.6.6, 9.8.2, 9.9.3, 9.10.4, 12.2.1

Definitions

1.1, 2.1.1, 3.1.1, 3.5, 3.12.1, 3.12.2, 3.12.3, 4.1.1, 15.1.1, 5.1, 6.1.2, 7.2.1, 7.3.1, 8.1, 9.1, 9.8.1

Delays and Extensions of Time

3.2, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, 8.3, 9.5.1, 9.7, 10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5

Disputes

6.3, 7.3.9, 15.1, 15.2

Documents and Samples at the Site

3.11

Drawings, Definition of

1.1.5

Drawings and Specifications, Use and Ownership of

3.11

Effective Date of Insurance

8.2.2, 11.1.2

Emergencies

10.4, 14.1.1.2, 15.1.4

Employees, Contractor's

3.3.2, 3.4.3, 3.8.1, 3.9, 3.18.2, 4.2.3, 4.2.6, 10.2, 10.3.3, 11.1.1, 11.3.7, 14.1, 14.2.1.1

Equipment, Labor, Materials or
 1.1.3, 1.1.6, 3.4, 3.5, 3.8.2, 3.8.3, 3.12, 3.13.1, 3.15.1,
 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3,
 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
 Execution and Progress of the Work
 1.1.3, 1.2.1, 1.2.2, 2.2.3, 2.2.5, 3.1, 3.3.1, 3.4.1, 3.5,
 3.7.1, 3.10.1, 3.12, 3.14, 4.2, 6.2.2, 7.1.3, 7.3.5, 8.2,
 9.5.1, 9.9.1, 10.2, 10.3, 12.2, 14.2, 14.3.1, 15.1.3
 Extensions of Time
 3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3, 7.4, 9.5.1, 9.7, 10.3.2,
 10.4.1, 14.3, 15.1.5, 15.2.5
Failure of Payment
 9.5.1.3, **9.7**, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2
 Faulty Work
 (See Defective or Nonconforming Work)
Final Completion and Final Payment
 4.2.1, 4.2.9, 9.8.2, **9.10**, 11.1.2, 11.1.3, 11.3.1, 11.3.5,
 12.3.1, 14.2.4, 14.4.3
 Financial Arrangements, Owner's
 2.2.1, 13.2.2, 14.1.1.4
 Fire and Extended Coverage Insurance
 11.3.1.1
GENERAL PROVISIONS
1
Governing Law
13.1
 Guarantees (See Warranty)
Hazardous Materials
 10.2.4, **10.3**
 Identification of Subcontractors and Suppliers
 5.2.1
Indemnification
 3.17, **3.18**, 9.10.2, 10.3.3, 10.3.5, 10.3.6, 11.3.1.2,
 11.3.7
Information and Services Required of the Owner
 2.1.2, **2.2**, 3.2.2, 3.12.4, 3.12.10, 6.1.3, 6.1.4, 6.2.5,
 9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.4, 13.5.1,
 13.5.2, 14.1.1.4, 14.1.4, 15.1.3
Initial Decision
15.2
Initial Decision Maker, Definition of
 1.1.8
 Initial Decision Maker, Decisions
 14.2.2, 14.2.4, 15.2.1, 15.2.2, 15.2.3, 15.2.4, 15.2.5
 Initial Decision Maker, Extent of Authority
 14.2.2, 14.2.4, 15.1.3, 15.2.1, 15.2.2, 15.2.3, 15.2.4,
 15.2.5
Injury or Damage to Person or Property
10.2.8, 10.4.1
 Inspections
 3.1.3, 3.3.3, 3.7.1, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3,
 9.9.2, 9.10.1, 12.2.1, 13.5
 Instructions to Bidders
 1.1.1
 Instructions to the Contractor
 3.2.4, 3.3.1, 3.8.1, 5.2.1, 7, 8.2.2, 12, 13.5.2

Instruments of Service, Definition of
1.1.7
 Insurance
 3.18.1, 6.1.1, 7.3.7, 9.3.2, 9.8.4, 9.9.1, 9.10.2, **11**
Insurance, Boiler and Machinery
11.3.2
Insurance, Contractor's Liability
11.1
 Insurance, Effective Date of
 8.2.2, 11.1.2
Insurance, Loss of Use
11.3.3
Insurance, Owner's Liability
11.2
Insurance, Property
 10.2.5, **11.3**
 Insurance, Stored Materials
 9.3.2
INSURANCE AND BONDS
11
 Insurance Companies, Consent to Partial Occupancy
 9.9.1
 Intent of the Contract Documents
 1.2.1, 4.2.7, 4.2.12, 4.2.13, 7.4
Interest
13.6
Interpretation
 1.2.3, **1.4**, 4.1.1, 5.1, 6.1.2, 15.1.1
 Interpretations, Written
 4.2.11, 4.2.12, 15.1.4
 Judgment on Final Award
 15.4.2
Labor and Materials, Equipment
 1.1.3, 1.1.6, **3.4**, 3.5, 3.8.2, 3.8.3, 3.12, 3.13, 3.15.1,
 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2, 9.3.3, 9.5.1.3,
 9.10.2, 10.2.1, 10.2.4, 14.2.1.1, 14.2.1.2
 Labor Disputes
 8.3.1
 Laws and Regulations
 1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13.1, 4.1.1, 9.6.4, 9.9.1,
 10.2.2, 11.1.1, 11.3, 13.1.1, 13.4, 13.5.1, 13.5.2,
 13.6.1, 14, 15.2.8, 15.4
 Liens
 2.1.2, 9.3.3, 9.10.2, 9.10.4, 15.2.8
 Limitations, Statutes of
 12.2.5, 13.7, 15.4.1.1
 Limitations of Liability
 2.3.1, 3.2.2, 3.5, 3.12.10, 3.17, 3.18.1, 4.2.6, 4.2.7,
 4.2.12, 6.2.2, 9.4.2, 9.6.4, 9.6.7, 10.2.5, 10.3.3,
 11.1.2, 11.2, 11.3.7, 12.2.5, 13.4.2
 Limitations of Time
 2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2.7,
 5.2, 5.3.1, 5.4.1, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3,
 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 11.3.1.5,
 11.3.6, 11.3.10, 12.2, 13.5, 13.7, 14, 15
Loss of Use Insurance
11.3.3

Material Suppliers
1.5, 3.12.1, 4.2.4, 4.2.6, 5.2.1, 9.3, 9.4.2, 9.6, 9.10.5

Materials, Hazardous
10.2.4, **10.3**

Materials, Labor, Equipment and
1.1.3, 1.1.6, 1.5.1, 3.4.1, 3.5, 3.8.2, 3.8.3, 3.12,
3.13.1, 3.15.1, 4.2.6, 4.2.7, 5.2.1, 6.2.1, 7.3.7, 9.3.2,
9.3.3, 9.5.1.3, 9.10.2, 10.2.1.2, 10.2.4, 14.2.1.1,
14.2.1.2

Means, Methods, Techniques, Sequences and
Procedures of Construction
3.3.1, 3.12.10, 4.2.2, 4.2.7, 9.4.2

Mechanic's Lien
2.1.2, 15.2.8

Mediation
8.3.1, 10.3.5, 10.3.6, 15.2.1, 15.2.5, 15.2.6, **15.3**,
15.4.1

Minor Changes in the Work
1.1.1, 3.12.8, 4.2.8, 7.1, **7.4**

MISCELLANEOUS PROVISIONS
13

Modifications, Definition of
1.1.1

Modifications to the Contract
1.1.1, 1.1.2, 3.11, 4.1.2, 4.2.1, 5.2.3, 7, 8.3.1, 9.7,
10.3.2, 11.3.1

Mutual Responsibility
6.2

Nonconforming Work, Acceptance of
9.6.6, 9.9.3, **12.3**
Nonconforming Work, Rejection and Correction of
2.3.1, 2.4.1, 3.5, 4.2.6, 6.2.4, 9.5.1, 9.8.2, 9.9.3,
9.10.4, 12.2.1

Notice
2.2.1, 2.3.1, 2.4.1, 3.2.4, 3.3.1, 3.7.2, 3.12.9, 5.2.1,
9.7, 9.10, 10.2.2, 11.1.3, 12.2.2.1, 13.3, 13.5.1,
13.5.2, 14.1, 14.2, 15.2.8, 15.4.1

Notice, Written
2.3.1, 2.4.1, 3.3.1, 3.9.2, 3.12.9, 3.12.10, 5.2.1, 9.7,
9.10, 10.2.2, 10.3, 11.1.3, 11.3.6, 12.2.2.1, **13.3**, 14,
15.2.8, 15.4.1

Notice of Claims
3.7.4, 10.2.8, **15.1.2**, 15.4
Notice of Testing and Inspections
13.5.1, 13.5.2

Observations, Contractor's
3.2, 3.7.4

Occupancy
2.2.2, 9.6.6, 9.8, 11.3.1.5

Orders, Written
1.1.1, 2.3, 3.9.2, 7, 8.2.2, 11.3.9, 12.1, 12.2.2.1,
13.5.2, 14.3.1

OWNER
2

Owner, Definition of
2.1.1

Owner, Information and Services Required of the
2.1.2, **2.2**, 3.2.2, 3.12.10, 6.1.3, 6.1.4, 6.2.5, 9.3.2,
9.6.1, 9.6.4, 9.9.2, 9.10.3, 10.3.3, 11.2, 11.3, 13.5.1,
13.5.2, 14.1.1.4, 14.1.4, 15.1.3

Owner's Authority
1.5, 2.1.1, 2.3.1, 2.4.1, 3.4.2, 3.8.1, 3.12.10, 3.14.2,
4.1.2, 4.1.3, 4.2.4, 4.2.9, 5.2.1, 5.2.4, 5.4.1, 6.1, 6.3,
7.2.1, 7.3.1, 8.2.2, 8.3.1, 9.3.1, 9.3.2, 9.5.1, 9.6.4,
9.9.1, 9.10.2, 10.3.2, 11.1.3, 11.3.3, 11.3.10, 12.2.2,
12.3.1, 13.2.2, 14.3, 14.4, 15.2.7

Owner's Financial Capability
2.2.1, 13.2.2, 14.1.1.4

Owner's Liability Insurance
11.2

Owner's Relationship with Subcontractors
1.1.2, 5.2, 5.3, 5.4, 9.6.4, 9.10.2, 14.2.2

Owner's Right to Carry Out the Work
2.4, 14.2.2

Owner's Right to Clean Up
6.3

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

6.1
Owner's Right to Stop the Work

2.3
Owner's Right to Suspend the Work

14.3
Owner's Right to Terminate the Contract

14.2
Ownership and Use of Drawings, Specifications
and Other Instruments of Service

1.1.1, 1.1.6, 1.1.7, **1.5**, 2.2.5, 3.2.2, 3.11.1, 3.17,
4.2.12, 5.3.1

Partial Occupancy or Use
9.6.6, **9.9**, 11.3.1.5

Patching, Cutting and
3.14, 6.2.5

Patents
3.17

Payment, Applications for
4.2.5, 7.3.9, 9.2, **9.3**, 9.4, 9.5, 9.6.3, 9.7, 9.8.5, 9.10.1,
14.2.3, 14.2.4, 14.4.3

Payment, Certificates for
4.2.5, 4.2.9, 9.3.3, **9.4**, 9.5, 9.6.1, 9.6.6, 9.7, 9.10.1,
9.10.3, 13.7, 14.1.1.3, 14.2.4

Payment, Failure of
9.5.1.3, **9.7**, 9.10.2, 13.6, 14.1.1.3, 14.2.1.2

Payment, Final
4.2.1, 4.2.9, 9.8.2, 9.10, 11.1.2, 11.1.3, 11.4.1, 12.3.1,
13.7, 14.2.4, 14.4.3

Payment Bond, Performance Bond and
7.3.7.4, 9.6.7, 9.10.3, **11.4**

Payments, Progress
9.3, **9.6**, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3

PAYMENTS AND COMPLETION
9

Payments to Subcontractors
 5.4.2, 9.5.1.3, 9.6.2, 9.6.3, 9.6.4, 9.6.7, 14.2.1.2
 PCB
 10.3.1
Performance Bond and Payment Bond
 7.3.7.4, 9.6.7, 9.10.3, 11.4
Permits, Fees, Notices and Compliance with Laws
 2.2.2, 3.7, 3.13, 7.3.7.4, 10.2.2
PERSONS AND PROPERTY, PROTECTION OF 10
 Polychlorinated Biphenyl
 10.3.1
Product Data, Definition of 3.12.2
Product Data and Samples, Shop Drawings
 3.11, 3.12, 4.2.7
Progress and Completion
 4.2.2, 8.2, 9.8, 9.9.1, 14.1.4, 15.1.3
Progress Payments
 9.3, 9.6, 9.8.5, 9.10.3, 13.6, 14.2.3, 15.1.3
Project, Definition of 1.1.4
 Project Representatives
 4.2.10
Property Insurance
 10.2.5, 11.3
PROTECTION OF PERSONS AND PROPERTY 10
 Regulations and Laws
 1.5, 3.2.3, 3.6, 3.7, 3.12.10, 3.13, 4.1.1, 9.6.4, 9.9.1, 10.2.2, 11.1, 11.4, 13.1, 13.4, 13.5.1, 13.5.2, 13.6, 14, 15.2.8, 15.4
 Rejection of Work
 3.5, 4.2.6, 12.2.1
 Releases and Waivers of Liens
 9.10.2
 Representations
 3.2.1, 3.5, 3.12.6, 6.2.2, 8.2.1, 9.3.3, 9.4.2, 9.5.1, 9.8.2, 9.10.1
 Representatives
 2.1.1, 3.1.1, 3.9, 4.1.1, 4.2.1, 4.2.2, 4.2.10, 5.1.1, 5.1.2, 13.2.1
 Responsibility for Those Performing the Work
 3.3.2, 3.18, 4.2.3, 5.3.1, 6.1.3, 6.2, 6.3, 9.5.1, 10
 Retainage
 9.3.1, 9.6.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3
Review of Contract Documents and Field Conditions by Contractor 3.2, 3.12.7, 6.1.3
 Review of Contractor's Submittals by Owner and Architect
 3.10.1, 3.10.2, 3.11, 3.12, 4.2, 5.2, 6.1.3, 9.2, 9.8.2
 Review of Shop Drawings, Product Data and Samples by Contractor
 3.12

Rights and Remedies
 1.1.2, 2.3, 2.4, 3.5, 3.7.4, 3.15.2, 4.2.6, 5.3, 5.4, 6.1, 6.3, 7.3.1, 8.3, 9.5.1, 9.7, 10.2.5, 10.3, 12.2.2, 12.2.4, 13.4, 14, 15.4
Royalties, Patents and Copyrights 3.17
 Rules and Notices for Arbitration
 15.4.1
Safety of Persons and Property 10.2, 10.4
Safety Precautions and Programs
 3.3.1, 4.2.2, 4.2.7, 5.3.1, 10.1, 10.2, 10.4
Samples, Definition of 3.12.3
Samples, Shop Drawings, Product Data and 3.11, 3.12, 4.2.7
Samples at the Site, Documents and 3.11
Schedule of Values 9.2, 9.3.1
 Schedules, Construction
 3.10, 3.12.1, 3.12.2, 6.1.3, 15.1.5.2
 Separate Contracts and Contractors
 1.1.4, 3.12.5, 3.14.2, 4.2.4, 4.2.7, 6, 8.3.1, 12.1.2
Shop Drawings, Definition of 3.12.1
Shop Drawings, Product Data and Samples 3.11, 3.12, 4.2.7
Site, Use of 3.13, 6.1.1, 6.2.1
 Site Inspections
 3.2.2, 3.3.3, 3.7.1, 3.7.4, 4.2, 9.4.2, 9.10.1, 13.5
 Site Visits, Architect's
 3.7.4, 4.2.2, 4.2.9, 9.4.2, 9.5.1, 9.9.2, 9.10.1, 13.5
 Special Inspections and Testing
 4.2.6, 12.2.1, 13.5
Specifications, Definition of 1.1.6
Specifications
 1.1.1, 1.1.6, 1.2.2, 1.5, 3.11, 3.12.10, 3.17, 4.2.14
 Statute of Limitations
 13.7, 15.4.1.1
 Stopping the Work
 2.3, 9.7, 10.3, 14.1
 Stored Materials
 6.2.1, 9.3.2, 10.2.1.2, 10.2.4
Subcontractor, Definition of 5.1.1
SUBCONTRACTORS 5
 Subcontractors, Work by
 1.2.2, 3.3.2, 3.12.1, 4.2.3, 5.2.3, 5.3, 5.4, 9.3.1.2, 9.6.7
Subcontractual Relations 5.3, 5.4, 9.3.1.2, 9.6, 9.10, 10.2.1, 14.1, 14.2.1

Submittals
3.10, 3.11, 3.12, 4.2.7, 5.2.1, 5.2.3, 7.3.7, 9.2, 9.3, 9.8, 9.9.1, 9.10.2, 9.10.3, 11.1.3
Submittal Schedule
3.10.2, 3.12.5, 4.2.7

Subrogation, Waivers of
6.1.1, **11.3.7**

Substantial Completion
4.2.9, 8.1.1, 8.1.3, 8.2.3, 9.4.2, **9.8**, 9.9.1, 9.10.3, 12.2, 13.7

Substantial Completion, Definition of
9.8.1
Substitution of Subcontractors
5.2.3, 5.2.4
Substitution of Architect
4.1.3
Substitutions of Materials
3.4.2, 3.5, 7.3.8

Sub-subcontractor, Definition of
5.1.2
Subsurface Conditions
3.7.4

Successors and Assigns
13.2

Superintendent
3.9, 10.2.6

Supervision and Construction Procedures
1.2.2, **3.3**, 3.4, 3.12.10, 4.2.2, 4.2.7, 6.1.3, 6.2.4, 7.1.3, 7.3.7, 8.2, 8.3.1, 9.4.2, 10, 12, 14, 15.1.3
Surety
5.4.1.2, 9.8.5, 9.10.2, 9.10.3, 14.2.2, 15.2.7
Surety, Consent of
9.10.2, 9.10.3
Surveys
2.2.3

Suspension by the Owner for Convenience
14.3
Suspension of the Work
5.4.2, 14.3
Suspension or Termination of the Contract
5.4.1.1, 14

Taxes
3.6, 3.8.2.1, 7.3.7.4

Termination by the Contractor
14.1, 15.1.6

Termination by the Owner for Cause
5.4.1.1, **14.2**, 15.1.6

Termination by the Owner for Convenience
14.4
Termination of the Architect
4.1.3
Termination of the Contractor
14.2.2

TERMINATION OR SUSPENSION OF THE CONTRACT
14

Tests and Inspections
3.1.3, 3.3.3, 4.2.2, 4.2.6, 4.2.9, 9.4.2, 9.8.3, 9.9.2, 9.10.1, 10.3.2, 11.4.1.1, 12.2.1, **13.5**

TIME
8
Time, Delays and Extensions of
3.2.4, 3.7.4, 5.2.3, 7.2.1, 7.3.1, 7.4, **8.3**, 9.5.1, 9.7, 10.3.2, 10.4.1, 14.3.2, 15.1.5, 15.2.5
Time Limits
2.1.2, 2.2, 2.4, 3.2.2, 3.10, 3.11, 3.12.5, 3.15.1, 4.2, 5.2, 5.3, 5.4, 6.2.4, 7.3, 7.4, 8.2, 9.2, 9.3.1, 9.3.3, 9.4.1, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 11.1.3, 12.2, 13.5, 13.7, 14, 15.1.2, 15.4

Time Limits on Claims
3.7.4, 10.2.8, **13.7**, 15.1.2

Title to Work
9.3.2, 9.3.3

Transmission of Data in Digital Form
1.6

UNCOVERING AND CORRECTION OF WORK
12
Uncovering of Work
12.1
Unforeseen Conditions, Concealed or Unknown
3.7.4, 8.3.1, 10.3
Unit Prices
7.3.3.2, 7.3.4
Use of Documents
1.1.1, 1.5, 2.2.5, 3.12.6, 5.3

Use of Site
3.13, 6.1.1, 6.2.1

Values, Schedule of
9.2, 9.3.1
Waiver of Claims by the Architect
13.4.2
Waiver of Claims by the Contractor
9.10.5, 13.4.2, 15.1.6
Waiver of Claims by the Owner
9.9.3, 9.10.3, 9.10.4, 12.2.2.1, 13.4.2, 14.2.4, 15.1.6
Waiver of Consequential Damages
14.2.4, 15.1.6
Waiver of Liens
9.10.2, 9.10.4

Waivers of Subrogation
6.1.1, **11.3.7**

Warranty
3.5, 4.2.9, 9.3.3, 9.8.4, 9.9.1, 9.10.4, 12.2.2, 13.7

Weather Delays
15.1.5.2

Work, Definition of
1.1.3
Written Consent
1.5.2, 3.4.2, 3.7.4, 3.12.8, 3.14.2, 4.1.2, 9.3.2, 9.8.5, 9.9.1, 9.10.2, 9.10.3, 11.4.1, 13.2, 13.4.2, 15.4.4.2
Written Interpretations
4.2.11, 4.2.12

Written Notice

2.3, 2.4, 3.3.1, 3.9, 3.12.9, 3.12.10, 5.2.1, 8.2.2, 9.7, 9.10, 10.2.2, 10.3, 11.1.3, 12.2.2, 12.2.4, **13.3**, 14, 15.4.1

Written Orders

1.1.1, 2.3, 3.9, 7, 8.2.2, 12.1, 12.2, 13.5.2, 14.3.1, 15.1.2



ARTICLE 1 GENERAL PROVISIONS

§ 1.1 BASIC DEFINITIONS

§ 1.1.1 THE CONTRACT DOCUMENTS

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. . The Contract Documents include the Advertisement for Bids, Instructions to Bidders, Notice to Bidders, Proposal Form, sample forms and all portions of addenda issued prior to execution of the Contract.

§ 1.1.2 THE CONTRACT

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

§ 1.1.3 THE WORK

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

§ 1.1.4 THE PROJECT

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

§ 1.1.5 THE DRAWINGS

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

§ 1.1.6 THE SPECIFICATIONS

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

§ 1.1.7 INSTRUMENTS OF SERVICE

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials. The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications

§ 1.1.8 INITIAL DECISION MAKER

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2 and certify termination of the Agreement under Section 14.2.2.

§ 1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

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

Work and obligations of the higher quality, larger quantity, greater expense, tighter schedule and more stringent requirements, unless otherwise directed in writing by the Owner.

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

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

§ 1.3 CAPITALIZATION

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

§ 1.4 INTERPRETATION

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

§ 1.5 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and will retain all common law, statutory and other reserved rights, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights. This Paragraph in no way supersedes the Owner's document rights set forth in the "Engineering Services Contract" Agreement Between the Owner and the Professional.

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

§ 1.6 TRANSMISSION OF DATA IN DIGITAL FORM

If the parties intend to transmit Instruments of Service or any other information or documentation in digital form, they shall endeavor to establish necessary protocols governing such transmissions, unless otherwise already provided in the Agreement or the Contract Documents.

§ 1.7 EXECUTION OF THE WORK

Sections of Division 01 General Requirements govern the execution of the Work of all Sections in Divisions 02-49 of the Specifications.

ARTICLE 2 OWNER

§ 2.1 GENERAL

§ 2.1.1 The Owner, as used in these Documents, refers to the Mississippi Transportation Commission, a body Corporate of the State of Mississippi, acting by and through the duly authorized Executive Director of the Mississippi Department of Transportation for the benefit of the Department for which the Work under this Contract is being performed. The Owner is the entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner's representative, who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization, is the individual who signed the Construction Contract for the Owner. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of or enforce mechanic's lien rights. Such

information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

§ 2.2.1 Prior to commencement of the Work, the Contractor may request in writing that the Owner provide reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. Thereafter, the Contractor may only request such evidence if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) a change in the Work materially changes the Contract Sum; or (3) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due. The Owner shall furnish such evidence as a condition precedent to commencement or continuation of the Work or the portion of the Work affected by a material change. After the Owner furnishes the evidence, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

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

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

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

§ 2.2.5 After the Contract is executed by the Executive Director, the Contractor will receive free of charge two bound copies of the Project Manual (Proposal and Contract Documents) (one executed and one blank), and five full-scale copies of the Drawings and two half-scale copies. The Contractor shall have available on the Project Site at all times one copy each of the Contract Drawings and the Project Manual (Proposal).

§ 2.3 OWNER'S RIGHT TO STOP THE WORK

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

§ 2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order shall be issued deducting from payments then or thereafter due the Contractor the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect or failure. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner.

ARTICLE 3 CONTRACTOR

§ 3.1 GENERAL

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have

express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

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

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

§ 3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

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

§ 3.2.2 Because the Contract Documents are complementary and any Work or material called for by either shall be provided as if called for by both, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.2.3, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

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

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

§ 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences or procedures, the Contractor shall evaluate the jobsite safety thereof and, except as stated below, shall be fully and solely responsible for the jobsite safety of such means, methods, techniques, sequences or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely written notice to the Owner and Architect and shall not proceed with that portion of the Work without further written instructions from the Architect. If the Contractor is then instructed to proceed with the required means, methods, techniques, sequences or procedures without acceptance of changes proposed by the Contractor, the Owner and Professional shall be responsible for any resulting loss or damage.

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

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

§ 3.4 LABOR AND MATERIALS

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. The Owner will furnish utilities for construction (electricity and water). Contractor must use "as-is" or pay for any necessary modifications.

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

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

§ 3.4.4 All Work as described or required shall be executed in a neat, skillful manner, in accordance with the best-recognized trade practice. Only competent workmen (including the superintendent), who work and perform their duties satisfactorily shall be employed on the Project. When requested by the Project Engineer, the Contractor shall discharge and shall not re-employ on the Project, any person who commits trespass or who is, in the opinion of the Project Engineer, dangerous, disorderly, insubordinate, incompetent, or otherwise objectionable.

§ 3.4.5 All materials and each part or detail of the Work are subject to inspection by the Project Engineer. Work performed or materials used by the Contractor without supervision, inspection, or written approval by an authorized Department representative may be ordered removed and replaced, at Contractor's expense, if found to be defective or noncompliant with the Contract Documents. No Work shall be performed on Legal Holidays, Sundays or after 5:00 P.M. on week days without prior written approval from the Project Engineer.

§ 3.5 WARRANTY

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

§ 3.6 TAXES

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

§ 3.7 PERMITS, FEES, NOTICES AND COMPLIANCE WITH LAWS

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

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

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

§ 3.7.4 **Concealed or Unknown Conditions.** If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 21 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor in writing, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may proceed as provided in Article 15.

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

§ 3.8 ALLOWANCES

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

§ 3.8.2 Unless otherwise provided in the Contract Documents,

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

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

§ 3.9 SUPERINTENDENT

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

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the name and qualifications of a proposed superintendent. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to the proposed superintendent or (2) that the Architect requires additional time to review. Failure of the Architect to reply within the 14 day period shall constitute notice of no reasonable objection.

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

§ 3.10 CONTRACTOR'S CONSTRUCTION SCHEDULES

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.

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

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

§ 3.11 DOCUMENTS AND SAMPLES AT THE SITE

The Contractor shall maintain at the site for the Owner one copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and one copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

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

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

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

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

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

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

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

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

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

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. The Contractor shall not be required to provide professional services in violation of applicable law. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall cause such services or certifications to be provided by a properly licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor all performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review, approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Contractor shall not be responsible for the adequacy of the performance and design criteria specified in the Contract Documents.

§ 3.13 USE OF SITE

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities and the Contract Documents and shall not unreasonably encumber the site with materials or equipment. The Contractor shall not allow tradesman, technicians and laborers to enter other portions of existing facilities except as predetermined and approved by the Project Engineer. Existing utilities shall not be interrupted unless pre-approved by the Project Engineer. Parking for construction vehicles shall be in areas designated by the Owner at the Pre-construction Conference.

§ 3.14 CUTTING AND PATCHING

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

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

§ 3.15 CLEANING UP

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

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

§ 3.16 ACCESS TO WORK

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

§ 3.17 ROYALTIES, PATENTS AND COPYRIGHTS

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

§ 3.18 INDEMNIFICATION

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

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

ARTICLE 4 ARCHITECT

§ 4.1 GENERAL

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

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

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

§ 4.1.4 The term "Architect," "Engineer," "Professional", or "Consultant" as used in these Documents refers to the Professional firm who has been directed by the Owner to design, provide Construction Documents and Construction Administration for this Project. These Consultants are advisors to the Project Engineer and MDOT Architect.

§ 4.1.5 The term "Project Engineer" as used in these Documents refers to the Mississippi Department of Transportation Executive Director's authorized representative. The Project Engineer shall be the Initial Decision Maker referenced in Article 15. The term "MDOT Architect" is the representative for the MDOT Architectural Services Unit and is an advisor to the Project Engineer.

§ 4.2 ADMINISTRATION OF THE CONTRACT

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

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Project Engineer, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

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

§ 4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Architect and Contractor shall endeavor to communicate with each other through the Project Engineer about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect to the MDOT Architect and Project Engineer. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Project Engineer.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and the Project Engineer will prepare State Estimates for Payment in such amounts.

§ 4.2.6 The Architect shall advise the Project Engineer to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will advise the Project Engineer to require inspection or testing of the Work in accordance with Sections 13.5.2 and 13.5.3, whether or not such Work is fabricated, installed or completed. However, neither this recommendation of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, material and equipment suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved

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submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5 and 3.12. The Architect's review shall not constitute approval of safety precautions or, unless otherwise specifically stated by the Architect, of any construction means, methods, techniques, sequences or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Project Engineer, with recommendations from the Architect, will prepare Supplemental Agreements (Change Orders) and Advanced Authority (Construction Change Directives), and may authorize minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Project Engineer, MDOT Architect, and Architect will conduct inspections to determine the date or dates of Completion; determine Final Acceptance; receive and forward to the Project Engineer, for review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Project Engineer and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The duties, responsibilities and limitations of authority of such project representatives shall be as set forth in an exhibit to be incorporated in the Contract Documents.

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

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

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

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

ARTICLE 5 SUBCONTRACTORS

§ 5.1 DEFINITIONS

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

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

§ 5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

§ 5.2.1 Unless otherwise stated in the Contract Documents or the bidding requirements, the Contractor, as soon as practicable after award of the Contract, shall furnish in writing to the Owner through the Architect the names of

persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each principal portion of the Work. The Architect may reply within 14 days to the Contractor in writing stating (1) whether the Owner or the Architect has reasonable objection to any such proposed person or entity or (2) that the Architect requires additional time for review. Failure of the Owner or Architect to reply within the 14-day period shall constitute notice of no reasonable objection.

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

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

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

§ 5.3 SUBCONTRACTUAL RELATIONS

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

§ 5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

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

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

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

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

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

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

§ 6.1.1 The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces and to award separate Contracts either in connection with other portions of the Project or other construction or operation on the site. In such event, the Contractor shall coordinate its activities with those of the Owner and of other Contractors so as to facilitate the general progress of all work being performed by all parties. Cooperation will be required in the arrangement for the storage of materials, and in the detailed execution of the work.

§ 6.1.2 The Contractor, including his subcontractors, shall keep informed of the progress and the detailed work of the Owner or other Contractors and shall immediately notify the Project Engineer and Architect of lack of progress or delays by other Contractors which are affecting Contractor's Work. Failure of Contractor to keep informed of the progress of the work of the Owner or other Contractors and / or failure of Contractor to give notice of lack of progress or delays by the Owner or other Contractors shall be deemed to be acceptance by Contractor of the status of progress by other Contractors for the proper coordination and completion of Contractor's Work. If, through acts or neglect on the part of the Contractor, the Owner or any other Contractor or subcontractor shall suffer loss or damage or assert any claims of whatever nature against the Owner, the Contractor shall defend, indemnify and hold harmless the Owner from any such claims or alleged damages, and the Contractor shall resolve such alleged damages or claims directly with the other Contractors or subcontractors.

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

(Paragraph deleted)

§ 6.2 MUTUAL RESPONSIBILITY

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

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a separate contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly report to the Architect apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the Contractor so to report shall constitute an acknowledgment that the Owner's or separate contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work, except as to defects not then reasonably discoverable.

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

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

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

§ 6.3 OWNER'S RIGHT TO CLEAN UP

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

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 GENERAL

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

§ 7.1.2 A Supplemental Agreement (Change Order) shall be based upon agreement among the Owner, Contractor and Architect; a Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor; an order for a minor change in the Work may be issued by the Project Engineer.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents, and the Contractor shall proceed promptly, unless otherwise provided in the Supplemental Agreement (Change Order), Advance Authority (Construction Change Directive) or order for a minor change in the Work.

§ 7.2 SUPPLEMENTAL AGREEMENT (CHANGE ORDERS)

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

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

§ 7.2.2 The maximum cost included in a Supplemental Agreement (Change Order) for profit and overhead is limited to twenty percent (20%) of the total of the actual cost for materials, labor and subcontracts. Profit and overhead include: all taxes, fees, permits, insurance, bond, job superintendent, job and home office expense. All Subcontractors shall comply passively without protest to the same requirements when participating in a Supplemental Agreement (Change Order).

§ 7.3 ADVANCE AUTHORITY (CONSTRUCTION CHANGE DIRECTIVES)

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

§ 7.3.2 A Construction Change Directive shall be used as Advanced Authority on changes to the Work where agreement has been reached prior to preparation of Supplemental Agreement (Change Order).

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

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.7.

§ 7.3.4 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed in a proposed Change Order or Construction Change Directive so that application of such unit prices to quantities of Work proposed will cause substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

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

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

§ 7.3.7 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the method and the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.7 shall be limited to the following:

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

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

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

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

§ 7.4 MINOR CHANGES IN THE WORK

The Architect has authority to order minor changes in the Work not involving adjustment in the Contract Sum or extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes will be effected by written order signed by the Architect and shall be binding on the Owner and Contractor.

ARTICLE 8 TIME

§ 8.1 DEFINITIONS

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

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

§ 8.1.3 The date of Completion is the date certified by the Project Engineer and approved by the Owner in accordance with Section 9.8.

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

§ 8.2 PROGRESS AND COMPLETION

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, prematurely commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the Contractor and Owner. The date of commencement of the Work shall not be changed by the effective date of such insurance.

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

§ 8.3 DELAYS AND EXTENSIONS OF TIME

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by any act of neglect of the Owner or Project Engineer, or by any employee or either, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or any causes beyond the Contractor's control, or by any other causes which the Project Engineer determines may justify the delay, then the Contract time may be extended by Change Order for such reasonable time as the Project Engineer may determine, subject to the Owner's approval. The Contractor's sole and exclusive right and remedy for delay by any cause whatsoever is an extension of the Contract Time but no increase in the Contract Sum. Any claim for loss or any delay occasioned by any separate Contractor, or Subcontractor, shall be settled between the Contractor and such other separate Contractor, or Subcontractors.

§ 8.3.2 No delay, interference, hindrance or disruption, from whatever source or cause, in the progress of the Contractor's Work shall be a basis for an extension of time unless the delay, interference hindrance or disruption is (1) without the fault and not the responsibility of the Contractor, its subcontractors and suppliers and (2) directly affects the overall completion of the Work as reflected on the critical path of the updated Construction Schedule. The contractor expressly agrees that the Owner shall have the benefit of any float in the construction schedule and delay in construction activities which do not affect the overall completion of the work does not entitle the Contractor to any extension in the Contract Time. § 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

(Paragraph deleted)

§ 8.3.4 This provision specifies the procedure for the determination of time extensions for unusually severe weather. In order for the Owner and Architect to award a time extension under this clause, the following conditions must be satisfied:

1. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month.
2. The unusually severe weather must actually cause a delay in the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

§ 8.3.5 The following schedule of monthly anticipated adverse weather delays is based on National Oceanic and Atmospheric Administration (NOAA) or similar data for the project location and will constitute the base line for monthly weather time evaluations. The Contractor's activity durations for inclusion in the progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities.

1. Adverse Weather Evaluation: The table below defines the monthly anticipated adverse weather in days for the project:

Adverse Weather Table

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
10	9	9	8	9	8	10	9	7	6	8	9

§ 8.3.6 Monthly anticipated adverse weather delay work days based on five (5) day work week.

§ 8.3.7 Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the Contract, the Contractor shall record on the daily report, the occurrence of adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on the overall projects' critical activities for 50 percent or more of the Contractor's scheduled workday. The number of actual adverse weather days shall include days impacted by actually adverse weather (even if adverse weather occurred in previous month), be calculated chronologically from the first to the last day of each month and be recorded as full days. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 8.3.5 above, the Owner and the Architect will convert any qualifying delays to calendar days giving full consideration for equivalent fair weather work days, and issue a modification in accordance with the Contract.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 CONTRACT SUM

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

§ 9.2 SCHEDULE OF VALUES

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

§ 9.3 APPLICATIONS FOR PAYMENT

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents. The form of Application for Payment will be AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet, or a computer generated form containing similar data.

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

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

§ 9.3.1.3 The Owner will retain five percent (5%) until the Work is at least fifty percent (50%) complete, on schedule, and satisfactory in the Project Engineer's opinion, at which time fifty percent (50%) of the retainage held to date shall be returned to the Contractor for distribution to the appropriate Sub-Contractors and Suppliers. Future retainage shall be withheld at the rate of two and one half percent (2-1/2%) of the amount due the Contractor on account of progress payments.

§ 9.3.1.4 The Contractor must submit each month with this Application for Payment a separate letter stating that he is requesting an extension of time or that he had no need for an extension for that period of time. No payment on a monthly application will be made until the letter is received. Complete justification such as weather reports or other pertinent correspondence must be included for each day's request for extension. A Contractor's letter, or statement, will not be considered as adequate justification. The receipt of this request and data by the Owner will not be considered as Owner approval in any way.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance

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by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

§ 9.3.2.1 Payment on materials stored at some location other than the building site, may be approved by the Project Engineer and the Owner after the Contractor has submitted the following items:

- .1 An acceptable Lease Agreement between the General Contractor and the owner of the land, or building, where the materials are located.
- .2 Consent of Surety, or other acceptable Bond, to cover the materials stored off-site.
- .3 All Perils Insurance coverage for the full value of the materials stored off-site.
- .4 A Bill of Sale from the Manufacturer to the General Contractor for the stored materials.
- .5 A complete list and inventory of materials manufactured, stored and delivered to the storage site and of materials removed from the storage site and delivered to the job site.
- .6 A review by the Project Engineer of the materials stored off-site prior to release of payment.
- .7 Guarantee no storage costs, additional delivery fees, or subsequent costs to the Owner.
- .8 List of stored items shall be sent to the Chief Engineer for his approval prior to payment of stored materials.

§ 9.3.2.2 Payment for materials stored at the building site, may be approved by the Project Engineer and the Owner after the Contractor has submitted the following items:

- .1 A Bill of Sale from the Manufacturer to the General Contractor for the stored materials.
- .2 List of stored items shall be sent to the Chief Engineer for his approval prior to payment of stored materials.

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

§ 9.4 CERTIFICATES FOR PAYMENT

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either recommend acceptance or state what portions should be modified to the Project Engineer for such amount as the Architect determines is properly due, or notify the Contractor and Project Engineer in writing of the Architect's reasons for modifications in whole or in part as provided in Section 9.5.1.

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

§ 9.5 DECISIONS TO WITHHOLD CERTIFICATION

§ 9.5.1 The Architect may recommend to withhold Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot

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

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a separate contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay;
or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When the above reasons for recommendations to withhold Payment are removed, recommendations will be made for amounts previously withheld.

(Paragraph deleted)

§ 9.6 PROGRESS PAYMENTS

§ 9.6.1 After the Architect has reviewed the Application for Payment and made recommendations to the Project Engineer, the Project Engineer shall make payment in the manner and within the time provided in the Contract Documents.

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

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

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

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

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

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any

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

§ 9.6.8 The amount retained by the Contractor from each payment to each Subcontractor and material supplier will not exceed the percentage retained by the Owner from the Contractor

§ 9.7 FAILURE OF PAYMENT

The Contractor and the Owner shall be subject to the remedies as prescribed in Section 31-5-25 of the Mississippi Code 1972, Annotated.

9.8 SUBSTANTIAL COMPLETION

(Paragraph deleted)

§ 9.8.1 Substantial Completion shall not be recognized under this Contract. The Project Engineer shall determine when the building or designated portion is complete to the point it can be used for its intended purpose. This date shall be the Date of Completion. All Warranties and Extended Warranties shall use this date as the starting date of Warranty Period.

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

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

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

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

§ 9.9 PARTIAL OCCUPANCY OR USE

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer as required under Section 11.3.1.5 and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

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

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

§ 9.10 FINAL COMPLETION AND FINAL PAYMENT

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

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

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

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

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.

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

§ 9.11 LIQUIDATED DAMAGES

§ 9.11.1 Time being of the essence and a matter of material consideration thereof, a reasonable estimate in advance is established to cover losses incurred by the Owner if the project is not substantially complete on the date set forth in the Contract Documents. The Contractor and his Surety will be liable for and will pay the Owner liquidated damages for each calendar day of delay until the work is substantially complete as follows:

For More Than	To and Including	Per Calendar D
	\$ 0	100,000 \$ 150
100,000	500,000	360
500,000	1,000,000	540
1,000,000	5,000,000	830
5,000,000	10,000,000	1,200
10,000,000	20,000,000	1,800
20,000,000	-----	3,500

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 SAFETY PRECAUTIONS AND PROGRAMS

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

§ 10.2 SAFETY OF PERSONS AND PROPERTY

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

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

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

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

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

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

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

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

§ 10.2.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

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

§ 10.3 HAZARDOUS MATERIALS

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

(Paragraphs deleted)

§ 10.4 EMERGENCIES

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

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 CONTRACTOR'S LIABILITY INSURANCE

§ 11.1.1 The Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located such insurance as will protect the Contractor from claims set forth below which may arise out of or result from the Contractor's operations and completed operations under the Contract and for which the Contractor may be legally liable, whether such operations be by the Contractor or by a Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

- .1 Claims under workers' compensation, disability benefit and other similar employee benefit acts that are applicable to the Work to be performed;
- .2 Claims for damages because of bodily injury, occupational sickness or disease, or death of the Contractor's employees;
- .3 Claims for damages because of bodily injury, sickness or disease, or death of any person other than the Contractor's employees;
- .4 Claims for damages insured by usual personal injury liability coverage;
- .5 Claims for damages, other than to the Work itself, because of injury to or destruction of tangible property, including loss of use resulting therefrom;
- .6 Claims for damages because of bodily injury, death of a person or property damage arising out of ownership, maintenance or use of a motor vehicle;
- .7 Claims for bodily injury or property damage arising out of completed operations; and
- .8 Claims involving contractual liability insurance applicable to the Contractor's obligations under Section 3.18.

§ 11.1.2 The insurance required by Section 11.1.1 shall be written for not less than limits of liability specified in the Contract Documents or required by law, whichever coverage is greater. Coverages, whether written on an occurrence or claims-made basis, shall be maintained without interruption from the date of commencement of the Work until the date of final payment and termination of any coverage required to be maintained after final payment, and, with respect to the Contractor's completed operations coverage, until the expiration of the period for correction of Work or for such other period for maintenance of completed operations coverage as specified in the Contract Documents.

§ 11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work and thereafter upon renewal or replacement of each required policy of insurance. These certificates and the insurance policies required by this Section 11.1 shall contain a provision that coverages afforded under the policies will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner. An additional certificate evidencing continuation of liability coverage, including coverage for completed operations, shall be submitted with the final Application for Payment as required by Section 9.10.2 and thereafter upon renewal

or replacement of such coverage until the expiration of the time required by Section 11.1.2. Information concerning reduction of coverage on account of revised limits or claims paid under the General Aggregate, or both, shall be furnished by the Contractor with reasonable promptness.

§ 11.1.4 The Contractor shall cause the commercial liability coverage required by the Contract Documents to include (1) the Owner, the Architect and the Architect’s consultants as additional insureds for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s operations; and (2) the Owner as an additional insured for claims caused in whole or in part by the Contractor’s negligent acts or omissions during the Contractor’s completed operations.

§ 11.1.5 The Contractor’s limits of liability shall be written for not less than the following:

- .1 GENERAL LIABILITY:**
 Commercial General Liability
 (Including XCU)
 General Aggregate.....\$ 1,000,000.00 Aggregate
 Products & Completed Operations.....\$ 1,000,000.00 Aggregate
 Personal & Advertising Injury..... \$ 500,000.00 Per Occurrence
 Bodily Injury & Property Damage..... \$ 500,000.00 Per Occurrence
 Fire Damage Liability..... \$ 50,000.00 Per Fire
 Medical Expense..... \$ 5,000.00 Per Person

- .2 OWNERS & CONTRACTORS PROTECTIVE LIABILITY:**
 Bodily Injury & Property Damage.....\$ 1,000,000.00 Aggregate
 Bodily Injury & Property Damage.....\$ 500,000.00 Per Occurrence

- .3 AUTOMOBILE LIABILITY:**
 (Owned, Non-owned & Hired Vehicle
 Contractor Insurance Option Number 1:
 Bodily Injury & Property Damage.....\$ 500,000.00 Per Occurrence
 (Combined Single Limit)
 Contractor Insurance Option Number 2:
 Bodily Injury.....\$ 250,000.00 Per Person
 Bodily Injury.....\$ 500,000.00 Per Accident
 Property Damage.....\$ 100,000.00 Per Occurrence

- .4 EXCESS LIABILITY:**
 (Umbrella on projects over \$500,000)
 Bodily Injury & Property Damage\$ 1,000,000.00 Aggregate
 (Combined Single Limit)

- .5 WORKERS’ COMPENSATION:**
 (As required by Statute)
EMPLOYERS’ LIABILITY:
 Accident\$ 100,000.00 Per Occurrence
 Disease\$ 500,000.00 Policy Limit
 Disease\$ 100,000.00 Per Employee

- .6 PROPERTY INSURANCE:**
 Builder’s Risk.....\$ Equal to Value of Work
 Or
 Installation Floater..... \$ Equal to Value of Work

§ 11.1.6 Furnish one (1) copy of the Standard Construction Contract Certificate of Insurance Form for each copy of the Standard Form of Agreement Between Owner and Contractor specifically setting forth evidence of all coverage required by Subparagraphs 11.1.1, 11.1.2 and 11.1.3. Furnish to the Owner copies of any endorsements that are subsequently issued amending limits of coverage.

§ 11.1.7 If the coverages are provided on a claims-made basis, the policy date or retroactive date shall predate the Contract: the termination date, or the policy, or applicable extended reporting period shall be no earlier than the termination date of coverages required to be maintained after final payment.

§ 11.2 OWNER'S LIABILITY INSURANCE

The Contractor shall purchase and maintain such insurance as will protect the Owner from his contingent liability to others for damages because of bodily injury, including death, and property damage, which may arise from operations under this Contract and other liability for damages which the Contractor is required to insure under any provision of this Contract. Certificate of this insurance will be filed with the Owner and will be the same limits set forth in 11.1.4.

§ 11.3 PROPERTY INSURANCE

§ 11.3.1 The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance written on a builder's risk "all-risk" or equivalent policy form in the amount of the initial Contract Sum, plus value of subsequent Contract Modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 11.3 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

§ 11.3.1.1 Property insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, earthquake, flood, windstorm, falsework, testing and startup, temporary buildings and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for Architect's and Contractor's services and expenses required as a result of such insured loss.

(Paragraph deleted)

§ 11.3.1.3 If the property insurance requires deductibles, the Contractor shall pay costs not covered because of such deductibles.

§ 11.3.1.4 This property insurance shall cover portions of the Work stored off the site, and also portions of the Work in transit.

§ 11.3.1.5 Partial occupancy or use in accordance with Section 9.9 shall not commence until the insurance company or companies providing property insurance have consented to such partial occupancy or use by endorsement or otherwise. The Owner and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.

(Paragraphs deleted)

§ 11.3.7 WAIVERS OF SUBROGATION

The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors described in Article 6, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this Section 11.3 or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the Owner as fiduciary. The Owner or Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors described in Article 6, if any, and the subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise,

did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

§ 11.3.8 A loss insured under the Owner's property insurance shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.3.10. The Contractor shall pay Subcontractors their just shares of insurance proceeds received by the Contractor, and by appropriate agreements, written where legally required for validity, shall require Subcontractors to make payments to their Sub-subcontractors in similar manner.

§ 11.3.9 If required in writing by a party in interest, the Owner as fiduciary shall, upon occurrence of an insured loss, give bond for proper performance of the Owner's duties. The cost of required bonds shall be charged against proceeds received as fiduciary. The Owner shall deposit in a separate account proceeds so received, which the Owner shall distribute in accordance with such agreement as the parties in interest may reach, or as determined in accordance with the method of binding dispute resolution selected in the Agreement between the Owner and Contractor. If after such loss no other special agreement is made and unless the Owner terminates the Contract for convenience, replacement of damaged property shall be performed by the Contractor after notification of a Change in the Work in accordance with Article 7.

§ 11.3.10 The Owner as fiduciary shall have power to adjust and settle a loss with insurers unless one of the parties in interest shall object in writing within five (5) days after occurrence of loss

§ 11.4 PERFORMANCE BOND AND PAYMENT BOND

§ 11.4.1 The Owner shall have the right to require the Contractor to furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder as stipulated in bidding requirements or specifically required in the Contract Documents on the date of execution of the Contract.

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

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 UNCOVERING OF WORK

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

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncovering and replacement shall, by appropriate Change Order, be at the Owner's expense. If such Work is not in accordance with the Contract Documents, such costs and the cost of correction shall be at the Contractor's expense unless the condition was caused by the Owner or a separate contractor in which event the Owner shall be responsible for payment of such costs.

§ 12.2 CORRECTION OF WORK

§ 12.2.1 BEFORE OR AFTER DATE OF COMPLETION

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

§ 12.2.2 AFTER DATE OF COMPLETION

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the

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Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.4.

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

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

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

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

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

§ 12.3 ACCEPTANCE OF NONCONFORMING WORK

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

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located except that, if the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 SUCCESSORS AND ASSIGNS

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

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

§ 13.3 WRITTEN NOTICE

Written notice shall be deemed to have been duly served if delivered in person to the individual, to a member of the firm or entity, or to an officer of the corporation for which it was intended; or if delivered at, or sent by registered or certified mail or by courier service providing proof of delivery to, the last business address known to the party giving notice.

§ 13.4 RIGHTS AND REMEDIES

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

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

§ 13.5 TESTS AND INSPECTIONS

§ 13.5.1 Tests, inspections and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of (1) tests, inspections or approvals that do not become requirements until after bids are received or negotiations concluded, and (2) tests, inspections or approvals where building codes or applicable laws or regulations prohibit the Owner from delegating their cost to the Contractor.

§ 13.5.2 If the Architect, Owner or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection or approval not included under Section 13.5.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection or approval by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.5.3, shall be at the Owner's expense.

§ 13.5.3 If such procedures for testing, inspection or approval under Sections 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure including those of repeated procedures and compensation for the Architect's services and expenses shall be at the Contractor's expense.

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

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

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

§ 13.6 INTEREST

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

§ 13.7 TIME LIMITS ON CLAIMS

The Owner and Contractor shall commence all claims and causes of action, whether in contract, tort, breach of warranty or otherwise, against the other arising out of or related to the Contract in accordance with the requirements of the final dispute resolution method selected in the Agreement within the time period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all claims and causes of action not commenced in accordance with this Section 13.7.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 TERMINATION BY THE CONTRACTOR

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

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other persons or entities performing portions of the Work under direct or indirect contract with the Contractor, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor promptly, upon the Contractor's request, reasonable evidence as required by Section 2.2.1.

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

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' written notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, including reasonable overhead and profit, costs incurred by reason of such termination, and damages.

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

§ 14.2 TERMINATION BY THE OWNER FOR CAUSE

§ 14.2.1 The Owner may terminate the Contract if the Contractor

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

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

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

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

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

may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 SUSPENSION BY THE OWNER FOR CONVENIENCE

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

§ 14.3.2 The Contract Time shall be adjusted for increases in the time caused by suspension, delay or interruption as described in Section 14.3.1. No adjustment shall be made to the extent

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

§ 14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

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

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

§ 14.4.3 In case of such termination for the Owner's convenience, the Contractor shall be entitled to receive payment for Work executed, and costs incurred by reason of such termination, along with reasonable overhead and profit on the Work not executed.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 CLAIMS

§ 15.1.1 DEFINITION

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim.

§ 15.1.2 NOTICE OF CLAIMS

Claims by either the Owner or Contractor must be initiated by written notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party must be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3 CONTINUING CONTRACT PERFORMANCE

Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents. The Architect will prepare Change Orders and issue Certificates for Payment in accordance with the decisions of the Initial Decision Maker.

§ 15.1.4 CLAIMS FOR ADDITIONAL COST

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

§ 15.1.5 CLAIMS FOR ADDITIONAL TIME

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

§ 15.1.5.2 ADVERSE WEATHER DELAYS

- .1 The Contractor shall anticipate delays in the progress of the Work, due to adverse weather, during the stipulated Contract Time in the amount of days published in recognized official data. If documented evidence (from recognized official data) indicates weather delays in excess of this amount, then the Contractor may be granted an Extension of Time for each Work Day, in excess of the normal days, in which the weather prevented work on the Project Site for fifty (50) percent or more of the Contractor's "Normal Work Day", but only if such prevented work was critical to the timely completion of the project.
- .2 Contractor's "Normal Work Day" shall be defined on the basis of a five (5) Day Work Week. Example: If the "normal" (regular) schedule is a five (5) Day Work Week, meaning Monday through Friday, then a rain on Sunday (since not a scheduled Work Day) will not necessarily delay the Work of the Project. However, site conditions, as a result of the rain, could partially or fully prevent scheduled outside work on Monday (and thereafter) thereby making the Contractor eligible to apply for a Weather Delay Extension of Time on the basis of the conditions stated in the paragraph above.

§ 15.1.5.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days' increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.

§ 15.1.5.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the causes of delay which may have concurrent or interrelated affects on the progress of the Work, or for concurrent delays due to the fault of the Contractor

§ 15.1.6 CLAIMS FOR CONSEQUENTIAL DAMAGES

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

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

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.6 shall be deemed to preclude an award of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 INITIAL DECISION

§ 15.2.1 Claims, excluding those arising under Sections 10.3, 10.4, 11.3.9, and 11.3.10, shall be referred to the Initial Decision Maker for initial decision. The Project Engineer will serve as the Initial Decision Maker. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Initial Decision Maker with no decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise,

or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

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

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

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

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

§ 15.2.6.1 Either party may, within 30 days from the date of an initial decision, demand in writing that the other party file for mediation within 60 days of the initial decision. If such a demand is made and the party receiving the demand fails to file for mediation within the time required, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

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

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

(Paragraphs deleted)

§ 15.5 ARBITRATION PROCEDURES FOR THE MISSISSIPPI TRANSPORTATION COMMISSION

All matters of dispute arising out of any agreement with the Mississippi Transportation Commission for planning, design, engineering, construction, erection, repair, or alteration of any building, structure, fixture, road, highway, utility or any part thereof, or any agreement with the Mississippi Transportation Commission for architectural, engineering, surveying, planning, and related professional services which provides for mediation or arbitration, shall comply with the following course for resolution. No arbitration hearing shall be granted on any claim in excess of One Hundred Thousand Dollars (\$100,000.00).

§ 15.5.1 CONDITIONS PRECEDENT TO ARBITRATION

The aggrieved party must first notify opposing party in writing in detail of the matter(s) in dispute, the amount involved and the remedy sought. Such writing shall include copies of any documents, writings, plans, or other matter pertinent to the resolution of the dispute. The Chief Engineer of the Mississippi Department of Transportation, or his authorized representative, and a principal of the opposing party shall be the proper parties for such notice and shall be active parties in any subsequent dispute resolution.

§ 15.5.2 REQUESTS FOR ARBITRATION: Within thirty (30) days of a claim being rejected in writing by the Project Engineer, either party may request arbitration. Notices for requests for arbitration shall be made in writing to the

Chief Engineer of the Mississippi Department of Transportation, P. O. Box 1850, Jackson, Mississippi 39215-1850. Such notice shall set forth in detail the matter(s) in dispute, the amount involved, and the remedy sought. A copy of the request shall be mailed to the opposite party. The party requesting arbitration must deposit the sum of two hundred dollars (\$200.00) with its request as a deposit against costs incurred by the arbitrators. Each party will be notified in writing in any manner provided by law of certified mail not less than twenty (20) days before the hearing of the date, time and place for the hearing. Appearance at the hearing waives a party's right to notice.

§ 15.5.3 SELECTION OF ARBITRATORS: Upon request for arbitration, a panel of three (3) arbitrators shall be chosen. The Chief Engineer of the Mississippi Department of Transportation shall appoint one (1) member. One (1) member shall be appointed by the Executive Director of a professional or trade association that represents interests similar to that of the non-state party. The first two shall appoint the third member.

§ 15.5.4 HEARINGS: All hearings shall be open to the public. All hearings will be held in Jackson, Mississippi, unless the parties mutually agree to another location. The hearings shall be conducted as prescribed by **Mississippi Code 1972, Annotated**, Sections 11-15-113, 11-15-115, and 11-15-117. A full and complete record of all proceedings shall be taken by a certified court reporter. The scheduling and cost of retaining the court reporter shall be the responsibility of the party requesting arbitration. The costs of transcription of the record shall be the responsibility of the party requesting such transcript. No arbitration hearing shall be held without a certified court reporter. Deliberations of the arbitrators shall not be part of the record.

§ 15.5.5 AWARDS: Awards shall be made in writing and signed by the arbitrators joining in the award. A copy of the award shall be delivered to the parties by certified mail.

§ 15.5.6 FEES AND EXPENSES: Reasonable fees and expenses, excluding counsel fees, incurred in the conduct of the arbitration shall be at the discretion of the Arbitrator except each party shall bear its own attorney's fees and costs of expert witnesses.

§ 15.5.7 MODIFICATIONS, CONFIRMATIONS, AND APPEALS: All modifications, confirmations and appeals shall be as prescribed by **Mississippi Code 1972, Annotated**, Section 11-15-123 et seq. All awards shall be reduced to judgment and satisfied in the same manner other judgments against the State are satisfied.

§ 15.5.8 SECRETARY FOR THE ARBITRATORS: All notices, requests, or other correspondence intended for the arbitrators shall be sent to the Chief Engineer, Mississippi Department of Transportation, P. O. Box 1850, Jackson, Mississippi 39215-1850.

(Paragraph deleted)

SECTION 00 91 13 ADDENDA

PART 1 - GENERAL

1.01 NOTICE TO BIDDERS

- A. Addenda issued on this Project will become part of the Standard Form of the Agreement Between the Owner and the Contractor.

- B. Addenda will be indicated on the second sheet of Section 905 (end of the Proposal/Project Manual) as addenda.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01 10 00

SUMMARY

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work covered by the Contract Documents shall be provided by one (1) General Contractor as one (1) Contract to improve the Hattiesburg USARC site in Hattiesburg, Mississippi known as MDOT Project No. SP-0210-00(025)101212.
- B. Time of Completion: The completion of this Work is to be on or before the time indicated on the Owner and Contractor Agreement.
- C. Contractor's Duties:
 - 1. Except as specifically noted, provide and pay for:
 - a. Labor, materials, equipment.
 - b. Tools, construction equipment, and machinery.
 - c. Other facilities and services necessary for proper execution and completion of the Work.
 - 2. Pay legally required sales, consumer, use, payroll, privilege and other taxes.
 - 3. Secure and pay for, as necessary for proper execution and completion of Work, and as applicable at time of receipt of bids:
 - a. Permits.
 - b. Government Fees.
 - c. Licenses.
 - 4. Give required notices
 - 5. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities that bear on performance of Work.
 - 6. Promptly submit written notice to Project Engineer of observed variance of Contract Documents from legal requirements. Appropriate modifications to Contract Documents will adjust necessary changes. Assume responsibility for Work known to be contrary to such requirements, without notice.
 - 7. Enforce strict discipline and good order among employees. Do not employ on Work, unfit persons or persons not skilled in assigned task.
 - 8. Schedule of Values: Submit 8 copies to the MDOT Architectural Services Unit a Schedule of Values as described in Section 01 29 73 of these Specifications. This submittal will be recorded as submittal number one for this Project. When this submittal is approved, a copy will be transmitted to Construction Administration to be used to review and compare to amounts submitted on the CAD-720 form. Other copies will be kept by Architectural Services Unit and distributed to Project Engineer, MDOT Consultants, and Contractor.
 - 9. Sub-Contractor List: Submit 8 copies of a list, acceptable to the MDOT, of all subcontractors to be used on the Project within seven (7) days after written notice of Contract award by the MDOT. The list shall include the Firm's name, contact person, street address, e-mail address, telephone and fax numbers. Submit original to Contract Administration Division and one copy to the Project Engineer and to the MDOT Architect CAD-720 form - REQUEST FOR PERMISSION TO SUBCONTRACT for each subcontractor before they are allowed to perform any Work.

10. Coordination: The Contractor is responsible for the coordination of the total Project. All subcontractors will cooperate with the Contractor so as to facilitate the general progress of the Work. Each trade shall afford all other trades every reasonable opportunity for the installation of their Work. Refer to Section 01 31 00– Project Management & Coordination.

1.02 CONTRACTOR'S USE OF PREMISES

- A. Confine operations at the site to areas permitted by:
 1. Law
 2. Ordinances
 3. Permits
 4. Contract Documents
 5. Owner
- B. Do not unreasonably encumber site with materials or equipment.
- C. Do not load structure with weight that will endanger structure.
- D. Assume full responsibility for protection and safekeeping of products stored on premises.
- E. Move stored products which interfere with operations of MDOT or other Contractors.
- F. Obtain and pay for use of additional storage of work areas needed for operations.
- G. Limit use of site for work and storage to the area indicated on the Drawings.

1.03 ACCESS TO SITE

- A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.
- B. Use of Site: Limit use of Project site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
 1. Limits: Confine construction operations to <Insert description of areas where work is permitted>.
 2. Limits: Limit site disturbance, including earthwork and clearing of vegetation, to 40 feet beyond building perimeter; 10 feet beyond surface walkways, patios, surface parking, and utilities less than 12 inches in diameter; 15 feet beyond primary roadway curbs and main utility branch trenches; and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities, and playing fields) that require additional staging areas in order to limit compaction in the constructed area.
 3. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
 - b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

- C. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period. Repair damage caused by construction operations.

1.04 COORDINATION WITH OCCUPANTS

- A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.
 - 1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
 - 2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.05 WORK RESTRICTIONS

- A. Work Restrictions, General: Comply with restrictions on construction operations.
 - 1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.
- B. On-Site Work Hours: Limit work in the existing building to normal business working hours of 7:00 a.m. to 5:00 p.m., Monday through Friday, unless otherwise indicated.
- C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Project Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Project Engineer's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Project Engineer not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Project Engineer's written permission before proceeding with disruptive operations.
- E. Nonsmoking Building: Smoking is not permitted within the building or within 25 feet of entrances, operable windows, or outdoor-air intakes.

1.06 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Format: The Specifications are organized into Groups, Subgroups, Divisions and Sections using CSI/CSC's "MasterFormat" 2004 Edition numbering system.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.
 - 2. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 - 3. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- C. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- D. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 - 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.
 - 2. Abbreviations: Materials and products are identified by abbreviations published as part of the U.S. National CAD Standard and scheduled on Drawings.
 - 3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Section numbers found in this Project Manual.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submittal requirements.
 - 2. Section 01 60 00 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.02 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1.03 ACTION SUBMITTALS

- A. The MDOT Architect and his Consultants WILL NOT consider requests for substitutions during bidding. ONLY ONE REQUEST per product will be allowed.
- B. Substitution Requests: Within 30 days after Notice to proceed, submit four copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b. Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.

- j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k. Cost information, including a proposal of change, if any, in the Contract Sum.
 - l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. MDOT Architect's Action: If necessary, MDOT Architect will request additional information or documentation for evaluation within ten days of receipt of a request for substitution. MDOT Architect will notify Contractor through Project Engineer of acceptance or rejection of proposed substitution within 15 days of receipt of request, or ten days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if MDOT Architect does not issue a decision on use of a proposed substitution within time allocated.

1.04 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

PART 2 - PRODUCTS

2.01 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals. ONLY ONE REQUEST per product will be allowed.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Contractor has personally investigated proposed product or method, compared the product specified with the proposed substitution, and determined that it is equal or superior in all respects to that specified.
 - c. Cost data is complete and includes all related costs under his Contract.
 - d. Contractor waives all claims for additional costs related to substitution that consequently becomes apparent.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.

- h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified warranty.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 30 days after the Notice to Proceed. ONLY ONE REQUEST per product will be allowed.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to MDOT Architect's Consultants for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Contractor has personally investigated proposed product or method, compared the product specified with the proposed substitution, and determined that it is equal or superior in all respects to that specified.
 - c. Cost data is complete and includes all related costs under his Contract.
 - d. Contractor waives all claims for additional costs related to substitution that consequently becomes apparent.
 - e. Requested substitution does not require extensive revisions to the Contract Documents.
 - f. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - g. Requested substitution will not adversely affect Contractor's construction schedule.
 - h. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - i. Requested substitution is compatible with other portions of the Work.
 - j. Requested substitution has been coordinated with other portions of the Work.
 - k. Requested substitution provides specified warranty.

PART 3 - EXECUTION

PRODUCT SUBSTITUTION REQUEST FORM

PROJECT: _____ PROJECT NO. _____

OWNER: _____

CONTRACTOR: _____

ARCHITECT: _____

CONTRACTOR'S REQUEST, WITH SUPPORTING DATA

1. Section of the Specifications to which this request applies:

- Product data for specified item and proposed substitution is attached (description of product, reference standards, performance and test data).
- Sample is attached

2. Itemized comparison of proposed substitution with product specified.

ORIGINAL PRODUCT	SUBSTITUTION
Name, brand _____	_____
Catalog No. _____	_____
Manufacturer _____	_____
Significant variations: _____	

Reason for Substitution:

3. Proposed change in Contract Sum:

Credit to Owner: \$ _____

Additional Cost to Owner: \$ _____

4. Effect of the proposed substitution on the Work:

Contract Time: _____

CONTRACTORS STATEMENT OF CONFORMANCE OF PROPOSED
SUBSTITUTION TO CONTRACT REQUIREMENTS

I / We have investigated the proposed substitution. I / We

1. Believe that it is equal or superior in all respects to originally specified product, except as stated in 2. above;
2. Will provide same warranty as required in Contract Documents;
3. Have included all cost data and cost implications of proposed substitution; including, if required, costs to other contractors, and redesign and special inspection costs caused by use of proposed substitution;
4. Will coordinate incorporation of proposed substitution in the Work;
5. Will modify other parts of the Work as may be needed, to make all parts of the Work complete and functioning;
6. Have verified that use of this substitution conforms to all applicable codes.
7. Waive future claims for added cost to Owner caused by proposed substitution.

CONTRACTOR _____ DATE: _____
Signature

MDOT ARCHITECT'S REVIEW AND ACTION

- Accepted
- Not Accepted
- Provide more information in the following categories and resubmit _____
- Sign Contractor's Statement of Conformance and resubmit
- Proposed substitution is accepted, with the following conditions:

Change Order (Supplemental Agreements) will make the following changes:

(Add to) (Deduct from) Contract Sum: \$ _____

(Add to) (Deduct from) Contract Time: _____ days

ARCHITECT: _____ DATE _____

OWNER: _____ DATE _____

Accepted Not accepted

END OF SECTION

SECTION 01 26 00

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications (Supplemental Agreements) by the Project Engineer and the Contractor.

1.02 CHANGE ORDER (SUPPLEMENTAL AGREEMENT) PROCEDURES

- A. Change Proposed by the Project Engineer: The Project Engineer may issue a Proposal Request to the Contractor which includes a detailed description of a proposed change with supplementary or revised Drawings and Specifications and a change in Contract Time for executing the change. The Contractor shall prepare and submit an estimate within 10 days.

- B. Change Proposed by the Contractor: The Contractor may propose a change by submitting a request for change to the Project Engineer, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation and a statement describing the effect on Work by separate or other Contractors. Document requested substitutions in accordance with Section 01 25 00 Substitution Procedures and Section 01 60 00 Product Requirements.

- C. Contractor's Documentation:

- 1. Maintain detailed records of Work completed on a time and material basis. Provide full information required for evaluation of proposed changes, and substantiate costs of changes in the Work.
- 2. Document each quotation for a change in cost or time with sufficient data allowing evaluation of the quotation.
- 3. On request, provide additional data to support computations:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance and bonds.
 - c. Overhead and profit.
 - d. Justification for change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
- 4. Support each claim for additional costs, and for work completed on a time and material basis, with additional information:
 - a. Origin and date of claim.
 - b. Dates and time work was performed and by whom.
 - c. Time records and wage rates paid.
 - d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.

- D. Construction Change Directive: The Project Engineer may issue a document, approved by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order (Supplemental Agreement). The document will describe changes in the Work, and will designate method of determining any change in the Contract Sum or Contract Time. The change in Work will be promptly executed.

- E. Format: The Project Engineer will prepare 5 originals of the Change Order (Supplemental Agreement) using the Mississippi Department of Transportation's Change Order (Supplemental Agreement) Form.
- F. Types of Change Orders (Supplemental Agreements):
 - 1. Stipulated Sum Change Orders: Based on Proposal Request and Contractor's fixed price quotation, or Contractor's request for a Change Order (Supplemental Agreement) as approved by the Project Engineer and the MDOT Architect.
 - 2. Unit Price Change Order: For pre-determined unit prices and quantities, the Change Order (Supplemental Agreement) will be executed on a fixed unit price basis. For unit costs or quantities of units of work, which are not pre-determined, execute Work under a Construction Change Directive. Changes in Contract Sum or Contract Time will be computed as specified for Time and Material Change Order (Supplemental Agreement).
 - 3. Time and Material Change Order (Supplemental Agreement): Submit itemized account and supporting data after completion of change, within time limits indicated in the Standard Form of Agreement Between the Owner and the Contractor. The Project Engineer will determine the change allowable in Contract Sum and Contract Time as provided in the Contract Documents. The Contractor shall maintain detailed records of Work accomplished on Time and Material basis and shall provide full information required for evaluation of proposed changes, and to substantiate costs for changes in the Work.
- G. Execution of Change Order (Supplemental Agreement): The Project Engineer will issue Change Orders (Supplemental Agreements) for signatures of parties as provided in the Standard Form of Agreement Between the Owner and the Contractor. Final execution of all Change Orders (Supplemental Agreements) requires approval by the Owner.
- H. Correlation of Contractor Submittals: The Contractor shall promptly revise Schedule of Values and the Application for Payment forms to record each authorized Change Order (Supplemental Agreement) as a separate line item and adjust the Contract Sum. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust time for other items of Work affected by the change and resubmit. Promptly enter changes in Project Record Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 29 00

Payment Procedures

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 2. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.02 SCHEDULE OF VALUES

- A. Scope: Submit [8] copies of the Schedule of Values to the MDOT Architect, with a copy of the Transmittal Letter to the Project Engineer, at least 10 days prior to submitting first Application for Payment. Upon Project Engineer's request, support the values given with data substantiating their correctness. Payment for materials stored on site will be limited to those listed in Schedule of Unit Material Values (refer to Article 9 of the Supplementary Conditions for requirements). Use Schedule of Values only as basis for contractor's Application for Payment
- B. The 8 copies of the Schedule of Values will be reviewed as Submittal No.1. A copy of this submittal will be reviewed by the Architect and Mechanical / Electrical Consultants. One copy will be retained by MDOT Architectural Services, one by Architect, Mechanical / Electrical Consultants, one sent to Contract Administration for use in reviewing requests for Permission to Sub-Contract (CAD-720 Form), one sent to the Project Engineer, and two returned to the Contractor. If any extra copies are needed for the Contractor, adjust number submitted.
- C. Form of Submittal: Submit typewritten Schedule of Values on AIA Document G703-1992, using Table of Contents of this Specification as basis for format for listing costs of Work for Sections under Divisions 02 - 49. Identify each line item with number and title as listed in Table of Contents of this Specification.
- D. Preparing Schedule of Values:
 - 1. Itemize separate line item costs for each of the following general cost items: Performance and Payment Bonds, field supervision and layout, temporary facilities and controls, and closeout documents.
 - 2. Itemize separate line item cost for Work required by each Section of this specification. Breakdown installed cost with overhead and profit.
 - 3. Each line item, which has installed value of more than \$20,000, break down costs to list major products for operations under each item; rounding figures to nearest dollar. Make sum of total costs of all items listed in schedule equal to total Contract Sum.

E. Preparing Schedule of Unit Material Values:

1. Submit separate schedule of unit prices for materials to be stored on which progress payments will be made. Make form of submittal parallel to Schedule of Values with each line item identified same as line item in Schedule of Values. Include in unit prices only: Cost of material, delivery and unloading site, and sales tax.
2. Make sure unit prices (if required) multiplied by quantities equal material cost of that item in Schedule of Values.

F. Review and Re-submittal: After Project Engineer / MDOT Architect's review, if requested, revise and resubmit schedule in same manner

1.03 METHOD FOR PAYMENT

- A. The method of measurement and payment shall conform to the applicable provisions of Article 9 of the AIA Document A201-2007 General Conditions of the Contract for Construction.

1.04 APPLICATIONS FOR PAYMENT

A. Format:

1. Applications for Payments will be prepared on AIA forms G702-Application and Certificate for payment and G703-Continuation Sheet; or, a computer generated form containing similar data may be used.

B. Preparation of Application:

1. Present required information in type written form.
2. Execute certification by signature of authorized officer.
3. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of Work performed and for stored products.
4. List each authorized Change Order (Supplemental Agreement) as an extension on continuation sheet, listing Change Order (Supplemental Agreement) number and dollar amount as for an original Item of Work.
5. Prepare Application for Final Payment as specified in Section 01 77 00-Closeout Procedures.

C. Submittal Procedures:

1. Submit five copies of each Application for Payment to the Project Engineer and one copy to the MDOT Architect.
2. Submit an updated construction schedule with each Application for Payment as described in Section 01 32 00-Construction Progress Documentation.
3. Submit request for payment at intervals agreed upon by the Project Engineer, Owner, and Contractor.
4. Submit requests to the Project Engineer at agreed upon times, or as may be directed otherwise.

D. Substantiating Data:

1. Submit data justifying dollar amounts in question when such information is needed.
2. Provide one copy of the data with a cover letter for each submittal.
3. Indicate the Application number, date and line item number and description.

1.05 STATEMENTS AND PAYROLLS

- A. The submission by the Contractor of the actual weekly payrolls showing all employees, hours worked, hourly rates, overtime hours, etc., or copies thereof, is not required to be turned in. However, each Contractor and Subcontractor shall preserve weekly payroll records for a period of three years from the date of Contract completion. All Contractor personnel working at the project site will be paid unconditionally and not less often than once a week without subsequent deduction or rebate on any account, except such payroll deductions as are permitted by regulations, the full amounts of wages and bona fide fringe benefits due at time of payment.
- B. The payroll records shall contain the name, with an individually identifying number for each employee, classification, rate of pay, daily and weekly number of hours worked, itemized deductions and actual wages paid to each employee.
- C. Upon request, the Contractor will make payroll records available at the project site for inspection by the Department Compliance Officer or authorized representative and will permit such officer or representative to interview employees on the job during working hours.
- D. The Contractor and Subcontractors shall submit Form CAD-880, "Weekly Summary of Wage Rates", each week to the Project Engineer. The forms may be obtained from the Contract Compliance Officer, Contract Administration Division, Mississippi Department of Transportation, Jackson, Mississippi. Custom forms, approved by Contract Administration Division, may be used in lieu of CAD forms.
- E. The Contractor shall make all efforts necessary to submit this information to the Project Engineer in a timely manner. The Engineer will have the authority to suspend the work wholly or in part and to withhold payments because of the Contractor's failure to submit the required information. Submission of forms and payrolls shall be current through the first week of the estimate period in order for the Project Engineer to process an estimate.

1.06 BASIS OF PAYMENT

- A. This Work will be paid for by Contract Sum for the construction in District Six. The Work includes renovating the Existing Hattiesburg USARC Building at Hattiesburg, Mississippi. The Contract Sum shall be full compensation for all site work, for furnishing all materials, and all other Work and effort of whatever nature in the construction of the buildings, installation of underground and other equipment, and final clean-up of the area. It shall also be complete compensation for all equipment, tools, labor, and incidentals necessary to complete the Work.
- B. Payment will be made under:
 - 1. Description A:
SP-0210-00(025) 101212
Hattiesburg USARC Building
In Hattiesburg, Mississippi lump sum

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

Hattiesburg USARC

01 29 00 - 3

Payment Procedures

SECTION 01 31 00

PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Scope: Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. Project Management.
 - 2. Requests for Information (RFIs).
 - 3. Project meetings.
- B. Project Coordinator: The General Contractor shall designate one individual as Project Coordinator (Superintendent), as referred to in the General Conditions. Prior to beginning Work his name, qualifications and address shall be submitted, in writing, to the MDOT Executive Director with copies to the Construction Engineer, Contract Administration Engineer, District Engineer, Project Engineer and MDOT Architect. Upon approval, he will remain until the Project is completed and cannot be removed during construction without just cause and without the written consent of the Project Engineer.
- C. Related Requirements:
 - 1. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.02 DEFINITIONS

- A. RFI: Request from Project Engineer, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.03 INFORMATIONAL SUBMITTALS

- A. Key Personnel List: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site.
 - 1. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers.
 - 2. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project
- B. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Use CSI Form 1.5A. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

1.04 DUTIES OF PROJECT COORDINATOR (SUPERINTENDENT)

- A. General: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 - 1. Coordination: Coordinate the work of all subcontractors and material suppliers.
 - 2. Supervision: Supervise the activities of every phase of Work taking place on the project.
 - 3. Contractor's Daily Job Diary: Submit copy of daily job diary to Project Engineer and MDOT Architect each Monday for previous week.
 - 4. Electrical: Take special care to coordinate and supervise the Work of electrical and other subcontractors.
 - 5. Communication: Establish lines of authority and communication at the job site.
 - 6. Location: The Project Coordinator (Superintendent) must be present on the job site at all times while work is in progress. Superintendent shall advise Project Engineer of an intended absence from the work and designate a person to be in charge of the Work during such absence.
 - 7. Permits: Assist in obtaining building and special permits required for construction.

- B. Interpretations of Contract Documents:
 - 1. Consultation: Consult with Project Engineer to obtain interpretations.
 - 2. Assistance: Assist in resolution of questions.
 - 3. Transmissions: Transmit written interpretations to concerned parties.

- C. Cessation of Work: Stop all Work not in accordance with the requirements of the Contract Documents.

- D. Division 01: Coordinate and assist in the preparation of all requirements of Division 01 and specifically as follows:
 - 1. Enforce safety requirements.
 - 2. Schedule of Value: Assist in preparation and be knowledgeable of each entry in the Schedule of Values.
 - 3. Cutting and Patching: Supervise and control all cutting and patching of other trades work.
 - 4. Project Meetings: Schedule with Project Engineer's approval and attend all project meetings.
 - 5. Construction Schedules: Prepare and submit all construction schedules. Supervise Work to monitor compliance with schedules.
 - 6. Shop Drawings, Product Data and Samples: Administer the processing of all submittals required by the Project Manual.
 - 7. Testing: Coordinate all required testing.
 - 8. Temporary Facilities and Controls: Allocate, maintain and monitor all temporary facilities.
 - 9. Substitutions: Administer the processing of all substitutions.
 - 10. Cleaning: Direct and execute a continuing (daily) cleaning program throughout construction, requiring each trade to dispose of their debris.
 - 11. Project Closeout: Collect and present all closeout documents to the Project Engineer.
 - 12. Project Record Documents: Maintain up-to-date Project Record Documents.

- E. Changes: Recommend and assist in the preparation of requests to the Project Engineer for any changes in the Contract.

- F. Application for Payment: Assist in the preparation and be knowledgeable of each entry in the Application and Certificate for Payment.

1.05 COORDINATION AND PROJECT CONDITIONS

- A. Coordinate scheduling, submittals, and Work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
- C. Coordinate space requirements, supports, and installation of Mechanical and Electrical Work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- D. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion and for portions of Work designated for Owner's partial occupancy, if required.
- E. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.06 SUBCONTRACTOR'S DUTIES

- A. The Subcontractor is responsible to coordinate and supervise his employees in the Work accomplished under his part of the Contract.
- B. Schedules: Conduct Work to assure compliance with construction schedules.
- C. Suppliers: Transmit all instructions to his material suppliers.
- D. Cooperation: Cooperate with the Project Coordinator and other subcontractors.

1.07 REQUESTS FOR INFORMATION (RFIs)

- A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 - 1. MDOT Architect will return RFIs submitted to MDOT Architect by other entities controlled by Contractor with no response.
 - 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 - 1. Project name.
 - 2. Project number.
 - 3. Date.
 - 4. Name of Contractor.
 - 5. Name of Architect

6. RFI number, numbered sequentially.
 7. RFI subject.
 8. Specification Section number and title and related paragraphs, as appropriate.
 9. Drawing number and detail references, as appropriate.
 10. Field dimensions and conditions, as appropriate.
 11. Contractor's suggested resolution. If Contractor's solution(s) impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 12. Contractor's signature.
 13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 14. RFI Forms: CSI Form 13.2A. Identify each page of attachments with the RFI number and sequential page number.
- C. MDOT Architect's Action: MDOT Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by MDOT Architect after 1:00 p.m. will be considered as received the following working day.
1. The following RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for coordination information already indicated in the Contract Documents.
 - d. Requests for adjustments in the Contract Time or the Contract Sum.
 - e. Requests for interpretation of Architect's actions on submittals.
 - f. Incomplete RFIs or inaccurately prepared RFIs.
 2. MDOT Architect's action may include a request for additional information, in which case MDOT Architect's time for response will date from time of receipt of additional information.
 3. MDOT Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 01 26 00 "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify MDOT Architect in writing within 7 days of receipt of the RFI response.
- D. On receipt of MDOT Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log the first week of each month. Use CSI Log Form 13.2B. Include the following:
1. Project name.
 2. Name and address of Contractor.
 3. Name and address of Architect.
 4. RFI number including RFIs that were dropped and not submitted.
 5. RFI description.
 6. Date the RFI was submitted.
 7. Date MDOT Architect's response was received.

- F. On receipt of MDOT Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify MDOT Architect within seven days if Contractor disagrees with response.
 - 1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
 - 2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

- 1.08 PROJECT MEETINGS
 - A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated. Project Meetings shall be held for the following reasons:
 - 1. Establish an understanding of what is expected from everyone involved.
 - 2. Enable an orderly Project review during the progress of the Work.
 - 3. Provide for systematic discussion of problems and effect remedies and clarifications.
 - 4. Coordination of the Work.
 - 5. Review installation procedures and schedules.

 - B. Scheduling and Administration: The Project Engineer shall schedule and preside over all meetings throughout the progress of the Work. Duties include the following:
 - 1. Review, modify / approve minutes of the previous meeting.
 - 2. Discuss items that have been done the previous month and anticipated work to be done within the next month.
 - 3. Review Contractor's Pay Request and resolve questions or conflicts with Construction Documents.

 - C. Scheduling and Administration: The Contractor shall attend and administer all meetings throughout the progress of the Work. Duties include the following:
 - 1. Preparation of agenda for meetings.
 - 2. Distribution of agenda and written notice 7 days in advance of date for each regularly scheduled meeting.
 - 3. Make physical arrangements for meetings.
 - 4. Record the minutes which shall include list of all participants and all significant proceedings and, in particular, all decisions, agreements, clarifications, and other data related to Project cost, time, and modifications.
 - 5. Distribute copies of minutes within 7 calendar days to all parties affected by decisions made at the meeting.
 - 6. Follow-up unresolved matters discussed at meetings and promptly effect final resolution, especially for work in progress. Advise all affected parties of result and include report of activities in next scheduled meeting.

 - D. Scheduling and Administration: Representatives of Contractor's, Subcontractor's, and Supplier's attending the meetings shall be qualified and authorized to act on behalf of the entity each represents.

 - E. Scheduling and Administration: Consultants may attend meetings to ascertain work is expedited consistent with Contract Documents and construction schedules.

- F. Preconstruction Conference:
1. Schedule: Schedule Pre-Construction Meeting within 10 days after Notice to Proceed.
 2. Location: A central site, convenient for all parties, designated by the Contractor and approved by the Project Engineer and the MDOT Architect.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Distribute and discuss tentative construction schedule prepared by Contractor.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Procedures for processing field decisions and Change Orders.
 - f. Procedures for RFIs.
 - g. Procedures for testing and inspecting.
 - h. Procedures for processing Applications for Payment.
 - i. Distribution of the Contract Documents.
 - j. Submittal procedures.
 - k. Preparation of record documents.
 - l. Use of the premises and existing building.
 - m. Work restrictions.
 - n. Working hours.
 - o. Owner's occupancy requirements.
 - p. Responsibility for temporary facilities and controls.
 - q. Procedures for moisture and mold control.
 - r. Procedures for disruptions and shutdowns.
 - s. Construction waste management and recycling.
 - t. Parking availability.
 - u. Office, work, and storage areas.
 - v. Equipment deliveries and priorities.
 - w. First aid.
 - x. Security.
 - y. Progress cleaning.
 4. Minutes: Record and distribute meeting minutes.
- G. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Project Engineer and MDOT Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility problems.

- k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

H. Progress Meetings:

- 1. Schedule: Progress Meetings will be scheduled monthly. The Project Engineer will cancel the meeting with at least 48 hours notice if a meeting is not necessary for any particular month.
- 2. Place of Progress Meetings: Contractor's Field Office except as otherwise agreed.
- 3. Attendance: Attending shall be the Project Engineer or his representative and MDOT representatives associated with the Project, the MDOT Architect or his representative (if requested by the District) and his Consultants, the General Contractor, and all Subcontractors as pertinent to the agenda.
- 4. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site utilization.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.

- 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of proposal requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
5. Minutes: Record and distribute the meeting minutes to each party present and to parties requiring information.
- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 32 00

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

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

1.02 SUBMITTALS

- A. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit initial schedules to the Project Engineer / MDOT Architect within 15 days after date of Notice to Proceed.
 - 2. Submit to the Project Engineer / MDOT Architect, periodically updated schedules accurately depicting progress to first day of each month.
 - 3. Submit 2 copies, one to be retained by the Project Engineer and the other forwarded to the MDOT Architect.
- B. Construction Schedule Updating Reports: Submit with Applications for Payment.
- C. Site Condition Reports: Submit at time of discovery of differing conditions.

1.03 COORDINATION

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

PART 2 - PRODUCTS

2.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Form of Schedules: Prepare in form of horizontal bar chart. The following is a minimum requirement and other type schedules are acceptable with Project Engineer's approval.
 - 1. Provide separate horizontal bar column for each trade or operation.
 - 2. Order: Table of Contents of Specifications.
 - a. Identify each column by major Specification section number.
 - 3. Horizontal Time Scale: Identify first work day of each week.
 - 4. Scale and Spacing: To allow space for updating.

- B. Content of Schedules:
 - 1. Provide complete sequence of construction by activity.
 - 2. Indicate dates for beginning and completion of each stage of construction.
 - 3. Identify Work of logically grouped activities.
 - 4. Show projected percentage of completion for each item of Work as of first day of each month.
- C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.
- D. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 - 1. Identification of activities that have changed.
 - 2. Changes in early and late start dates.
 - 3. Changes in early and late finish dates.
 - 4. Changes in activity durations in workdays.
 - 5. Changes in the Contract Time.
- E. If the Contractor is required to produce two revised construction schedules because of lack of progress in the Work, the Owner will notify the Contractor's surety.

2.02 REPORTS

- A. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 3 - EXECUTION

3.01 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate final completion percentage for each activity.

- B. Distribution: Distribute copies of approved schedule to Project Engineer, MDOT Architect, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
1. Post copies in Project meeting rooms and temporary field offices.
 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Periodic construction photographs.

1.02 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit (e-mail) image files on a weekly basis.

1. Digital Camera: Minimum sensor resolution of 8 megapixels.
2. Format: Minimum 3200 by 2400 pixels, in unaltered original files, with same aspect ratio as the sensor, uncropped, date and time stamped, in folder named by date of photograph, accompanied by key plan file.
3. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name of photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of vantage point, indicating location, direction (by compass point), and elevation of construction.
 - g. Unique sequential identifier keyed to accompanying key plan.

PART 2 - PRODUCTS

2.01 PHOTOGRAPHIC MEDIA

A. Digital Images: Provide images in JPG format, produced by a digital camera with minimum sensor size of 8 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

PART 3 - EXECUTION

3.01 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

- B. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.
 - 1. Date and Time: Include date and time in file name for each image.
 - 2. Field Office Images: Maintain one set of images accessible in the field office at Project site, available at all times for reference. Identify images in the same manner as those submitted to Project Engineer / MDOT Architect.
- C. Periodic Construction Photographs: Take photographs for each day that any substantial construction activity occurs at the job site. The number of photographs to be taken shall vary, depending on the construction activity that day. The purpose of the photographs is to document the installation of the work and verify that the work is being installed properly.
- D. Project Engineer /MDOT Architect -Directed Construction Photographs: The Project Engineer / MDOT Architect may direct the Contractor to take certain photographs during his job site observation or at any time as directed.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Scope: Submit to the MDOT Architectural Services Unit shop drawings, product data, and samples required by Specification Sections. Faxed submittals WILL NOT be accepted. DO NOT submit Material Safety Data Sheets for approval. Refer to Section 01 25 00 – Substitution Procedures and Section 01 60 00 – Product Requirements, for requirements concerning products that will be acceptable on this Project.
- C. Related Requirements:
 - 1. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 3. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.

1.02 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require MDOT Architect's responsive action.
- B. Informational Submittals: Written and graphic information and physical samples that do not require MDOT Architect's responsive action. Submittals may be rejected for not complying with requirements.

1.03 ACTION SUBMITTALS

- A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by MDOT Architect and additional time for handling and reviewing submittals required by those corrections.
 - 1. Acceptance of submittal items will not preclude rejection of these items upon discovery of defects in them prior to final acceptance of completed Work.

1.04 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Architect's Digital Data Files: Electronic copies of digital data files of the Contract Drawings will not be provided by Architect for Contractor's use in preparing submittals.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
 - 1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. MDOT Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on MDOT Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.
 - 1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. MDOT Architect will advise Contractor when a submittal being processed must be delayed for coordination.
 - 2. Partial submittals are NOT ACCEPTABLE, will be considered non-responsive, and will be returned without review.
 - 3. Resubmittal Review: Allow 15 days for review of each resubmittal.
- D. Paper Submittals: Place a permanent label or title block on each submittal item for identification.
 - 1. Indicate name of firm or entity that prepared each submittal on label or title block.
 - 2. Provide a space approximately 3 by 4 inches on label or beside title block to record Contractor's review and approval markings and action taken by MDOT Architect.
 - 3. Include the following information for processing and recording action taken:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Name of subcontractor.
 - f. Name of supplier.
 - g. Name of manufacturer.
 - h. Submittal number or other unique identifier, including revision identifier.
 - 1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).
 - i. Number and title of appropriate Specification Section.
 - j. Drawing number and detail references, as appropriate.
 - k. Location(s) where product is to be installed, as appropriate.
 - l. Other necessary identification.

4. Transmittal for Paper Submittals: Accompany submittals with transmittal letter, containing data, project title and number; Contractor's name and address; the number of each Shop Drawings, product data and samples submitted; notification of deviations from Contract Documents; and other pertinent data. Submittals shall be sent to MDOT Architect for review or distribution to Consultants, with copy of Transmittal Letter sent to Project Engineer. MDOT Architect will return without review submittals received from sources other than Contractor.
 - a. Transmittal Form for Paper Submittals: Use AIA Document G810 or CSI Form 12.1A.
 - b. Transmittal Form for Paper Submittals: Provide locations on form for the following information:
 - 1) Project name.
 - 2) Date.
 - 3) Destination (To:).
 - 4) Source (From:).
 - 5) Name and address of Architect.
 - 6) Name of Contractor.
 - 7) Name of firm or entity that prepared submittal.
 - 8) Names of subcontractor, manufacturer, and supplier.
 - 9) Category and type of submittal.
 - 10) Submittal purpose and description.
 - 11) Specification Section number and title.
 - 12) Specification paragraph number or drawing designation and generic name for each of multiple items.
 - 13) Drawing number and detail references, as appropriate.
 - 14) Transmittal number, numbered consecutively.
 - 15) Submittal and transmittal distribution record.
 - 16) Remarks.
 - 17) Signature of transmitter.
 - 18) Contractor's stamp, initialed or signed, certifying the review of submittal, verification of field measurements, and compliance with Contract Documents PRIOR to submitting to the MDOT Architectural Services Unit.
- E. Electronic Submittals (Optional): Identify and incorporate information in each electronic submittal file as follows:
 1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
 2. Name file with submittal number or other unique identifier, including revision identifier.
 - a. File name shall use project identifier and Specification Section number followed by a decimal point and then a sequential number (e.g., LNHS-061000.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., LNHS-061000.01.A).
 3. Provide means for insertion to permanently record Contractor's review and approval markings and action taken by MDOT Architect.
 4. Transmittal Form for Electronic Submittals: Use electronic form acceptable to Project Engineer and MDOT Architect, containing the following information:
 - a. Project name.
 - b. Date.
 - c. Name and address of Architect.
 - d. Name of Contractor.
 - e. Name of firm or entity that prepared submittal.
 - f. Names of subcontractor, manufacturer, and supplier.

- g. Category and type of submittal.
 - h. Submittal purpose and description.
 - i. Specification Section number and title.
 - j. Specification paragraph number or drawing designation and generic name for each of multiple items.
 - k. Drawing number and detail references, as appropriate.
 - l. Location(s) where product is to be installed, as appropriate.
 - m. Related physical samples submitted directly.
 - n. Indication of full or partial submittal.
 - o. Transmittal number, numbered consecutively.
 - p. Submittal and transmittal distribution record.
 - q. Other necessary identification.
 - r. Remarks.
5. Metadata: Include the following information as keywords in the electronic submittal file metadata:
- a. Project name.
 - b. Number and title of appropriate Specification Section.
 - c. Manufacturer name.
 - d. Product name.
- F. Options: Identify options requiring selection by MDOT Architect.
- G. Deviations: Identify deviations from the Contract Documents on submittals.
- H. Re-submittals: Make re-submittals in same form and number of copies as initial submittal.
- 1. Note date and content of previous submittal.
 - 2. Note date and content of revision in label or title block and clearly indicate extent of revision.
 - 3. Resubmit submittals until they are marked with approval notation from MDOT Architect's action stamp.
- I. Distribution of Submittals after Review:
- 1. Distribute copies of Shop Drawings and product data which carry MDOT Architect's / Consultant's stamp to: Project Engineer's File, Architectural Services Unit File, Architect's File(as required) / Electrical / Mechanical / Structural Engineer's File (as required), Materials' File (if concrete), Contractor's File, Job Site File, and Subcontractor, Supplier and/or Fabricator as necessary.
 - 2. Distribute samples as directed. The Project Engineer, MDOT Architect and Consultant (as required) shall retain one of each.
- J. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from MDOT Architect's action stamp.
- K. After an item has been accepted, no change in brand, make, manufacturer's catalog number, or characteristics will be considered unless:
- 1. Satisfactory written evidence is presented to and approved by the Project Engineer, that manufacturer cannot make scheduled delivery of accepted item, or;
 - 2. Item delivered has been rejected and substitution of a suitable item is an urgent necessity, or;
 - 3. Other conditions became apparent which indicates acceptance of such substitute item to be in the best interest of the Owner.

PART 2 - PRODUCTS

2.01 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements:

1. Submit electronic submittals (optional-Preferred for 8 1/2 by 11 inches submittals only) via email as PDF electronic files.
 - a. MDOT Architect will return annotated file. Annotate and retain one copy of file as an electronic Project record document file.
2. Action Submittals: Submit eight paper (required for all submittals over 8 1/2 by 11 inches in size) copies of each submittal with additional number of copies, if required, by Contractor for distribution. MDOT Architect will return four copies, unless indicated otherwise.
3. Informational Submittals: Submit three paper copies of each submittal unless otherwise indicated. MDOT Architect will not return copies.
4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
 - a. Provide a digital signature with digital certificate on electronically-submitted certificates and certifications where indicated.
 - b. Provide a notarized statement on original paper copy certificates and certifications where indicated.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:
 - a. Manufacturer's catalog cuts.
 - b. Manufacturer's product specifications.
 - c. Standard color charts.
 - d. Statement of compliance with specified referenced standards.
 - e. Testing by recognized testing agency.
 - f. Application of testing agency labels and seals.
 - g. Notation of coordination requirements.
 - h. Availability and delivery time information.
4. For equipment, include the following in addition to the above, as applicable:
 - a. Wiring diagrams showing factory-installed wiring.
 - b. Printed performance curves.
 - c. Operational range diagrams.
 - d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.
5. Submit Product Data concurrent with Samples.
6. Submit Product Data in the following format:
 - a. PDF electronic file. (or)
 - b. Submit eight paper copies of each submittal with additional number of copies, if required, by Contractor for distribution. MDOT Architect will return four copies, unless indicated otherwise

- C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.
1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Identification of products.
 - b. Schedules.
 - c. Compliance with specified standards.
 - d. Notation of coordination requirements.
 - e. Notation of dimensions (required) established by field measurement.
 - f. Relationship and attachment to adjoining construction clearly indicated.
 - g. Seal and signature of professional engineer if specified.
 2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches, but no larger than 24 by 36 inches.
 3. Submit Shop Drawings in the following format:
 - a. PDF electronic file. (or)
 - b. Submit eight paper copies of each submittal with additional number of copies, if required, by Contractor for distribution. MDOT Architect will return four copies, unless indicated otherwise
- D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
 2. Identification: Attach label on unexposed side of Samples that includes the following:
 - a. Generic description of Sample.
 - b. Product name and name of manufacturer.
 - c. Sample source.
 - d. Number and title of applicable Specification Section.
 3. For projects where electronic submittals are required, provide corresponding electronic submittal of Sample transmittal, digital image file illustrating Sample characteristics, and identification information for record.
 4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
 - b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.
 5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - a. Number of Samples: Submit two full set(s) of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. MDOT Architect will return one sample with options selected.
 - b. If a specified product color is discontinued, Contractor shall notify Project Engineer promptly to determine if it affects other color selections.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.
 - a. Number of Samples: Submit four sets of Samples. Project Engineer and MDOT Architect will retain two Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record sample.
- E. Field Samples and Mock-Ups: Erect on Project Site at location acceptable to Project Engineer.
 1. Construct each sample or mock-up complete, including Work of all trades required in the finished Work. Field Samples are used to determine standards in materials, color, texture, workmanship, and overall appearance.
 2. Work shall not be allowed using these materials until the mock-up is approved.
 3. The mock-up shall not be destroyed, until after the Work it represents is finished, without permission of the Project Engineer. This mock-up shall be used as a standard to compare to the Work it represents for color, craftsmanship, overall appearance, and how the different materials make up the whole system.
- F. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:
 1. Submit product schedule in the following format:
 - a. PDF electronic file. (or)
 - b. Four paper copies of product schedule or list unless otherwise indicated. Architect will return two copies.
- G. Coordination Drawings Submittals: Comply with requirements specified in Section 01 31 00 "Project Management and Coordination."
- H. Contractor's Construction Schedule: Comply with requirements specified in Section 01 32 00 "Construction Progress Documentation."
- I. Application for Payment and Schedule of Values: Comply with requirements specified in Section 01 29 00 "Payment Procedures."
- J. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 01 40 00 "Quality Requirements."
- K. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 01 77 00 "Closeout Procedures."
- L. Maintenance Data: Comply with requirements specified in Section 01 78 23 "Operation and Maintenance Data."
- M. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

- N. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- O. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- P. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- Q. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.
- R. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- S. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- T. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- U. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.
- V. Schedule of Tests and Inspections: Comply with requirements specified in Section 01 40 00 "Quality Requirements."
- W. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- X. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- Y. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Z. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

2.02 DELEGATED-DESIGN SERVICES

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

PART 3 - EXECUTION

3.01 CONTRACTOR'S REVIEW

- A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to MDOT Architectural Services Unit.
- B. Project Closeout and Maintenance Material Submittals: See requirements in Section 01 77 00 "Closeout Procedures."
- C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.
- D. Notify the Project Engineer in writing at the time of submission, of deviations in submittals from requirements of Contract Documents.
- E. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by review of submittals unless written acceptance of specific deviations is given.
- F. Contractor's responsibility for errors and omissions in submittals is not relieved by MDOT Architect's / Consultant's review of submittals.
- G. Do not order materials or begin Work requiring submittals until the return of submittals bearing MDOT Architect / Consultant's stamp and initials indicating review.

3.02 MDOT ARCHITECT'S / CONSULTANTS' ACTION

- A. General: MDOT Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.
- B. Action Submittals: MDOT Architect / Consultants will review with reasonable promptness, each submittal for design concept of Project and information given in Contract Documents, make marks to indicate corrections or revisions required, and return submittals to the Architectural Services Unit, which will retain one copy and forward one copy to the Project Engineer, one copy to the Materials Engineer (if concrete), and the remainder to the Contractor. MDOT Architect / Consultants will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action. Consultants will retain one copy of reviewed submittals.
- C. Informational Submittals: MDOT Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. MDOT Architect will forward each submittal to appropriate party.
- D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.
- E. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION

SECTION 01 35 16

ALTERATION PROJECT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Project coordination and assignment of the work of all Parties and the scheduling of all elements of alterations and renovation work by procedures and methods to expedite completion of the Work for each Part.
- B. Work to be assigned, coordinated and scheduled includes, but is not limited to, the following:
 - 1. Work of each Division and Section of the Specifications as shown on the Drawings and in the Specifications
 - 2. Procedures and activities required under the provisions of this Section.

1.02 PROJECT COORDINATION

- A. Definition: Project Coordination is the process utilized to guide all participants in the Project's construction and includes assigning, scheduling, expediting, reviewing, and modifying, as appropriate, the activities required to produce the total Work to the designated quality and within the assigned time.
- B. Responsibility: Except otherwise provided by the Contract Documents, all Project Coordination shall be the entire responsibility of the Contractor. The Contractor shall set forth procedures and conditions for coordination of the Work and shall personally be responsible for the implementation of the required coordination which shall include the following:
 - 1. Communications: Establish lines of authority and communication at the Job Site.
 - 2. General Coordination: Closely coordinate all work of Project participants to effect quality construction and steady progress in all phases and aspects of the Work with a minimum of delays and interference.
 - 3. Special Coordination Give additional careful attention to the work of the following:
 - a. Mechanical / Electrical Subcontractors and be responsible for the following:
 - 1) Establishment of locations, clearances and precedence for all piping, conduit and ductwork (underground and above ceilings).
 - 2) Submittal of Schematic Drawings giving location and clearance information for Architect / Engineer review.
 - 4. Supervision: Supervise the activities of every phase of the Work of the Project. Make frequent inspections of the Work to determine progress and quality; proceed immediately to remedy problems and to effect changes needed in the construction process and personnel.
 - 5. Interpretation of Contract Documents:
 - a. Consultation: Consult with MDOT Architect to obtain interpretations.
 - b. Assistance: Assist in resolution of questions.
 - c. Stop work not in accordance with the requirements of the Contract Documents.
 - 6. Division One: Coordinate requirements of Division One and specifically as follows:
 - a. Testing: Coordinate all required testing. Refer to Section 01 45 29.
 - b. Temporary Facilities and Controls: Allocate, maintain and monitor all temporary facilities. Refer to Section 01 50 00.

- c. Cutting and Patching: Supervise and control all cutting and patching. Refer to Section 01 73 00 - Execution.
 - d. Cleaning: Direct and execute a continuing cleaning program throughout the construction, requiring each trade to dispose of their own debris, except as otherwise provided in the Contract Documents. Refer to Section 01 74 00.
 - e. Project Record Documents: Maintain up-to-date project record documents. Refer to Section 01 78 39.
- 7. Enforce all safety requirements.
 - 8. Maintain quality control of all work.

1.03 QUALITY CONTROL

- A. Assign all elements of the work to trades qualified to perform each type of work.
- B. Patch, repair and refinish existing work using skilled mechanics that are capable of matching existing quality of workmanship. Quality of patched or extended work shall be not less than that specified for new work.

1.04 PROJECT MEETINGS

- A. When required by Project Engineer / MDOT Architect or by individual Specification Sections, convene meetings to coordinate the Work and / or to review conditions at the Site and to outline procedures by which the Work will be performed. Refer to Section 01 31 00 – Project Management & Coordination.
- B. Require attendance by all affected Parties.

1.05 CONSTRUCTION ACCESS

- A. Access to construction area for construction materials and exit way for demolition debris shall be as directed by the Project Engineer.

1.06 PROTECTION OF WORK

- A. Protect from damage, existing finishes, equipment, adjacent work scheduled to remain, and all new work.
 - 1. Protect existing and new work from temperature extremes. Maintain interior work above 60 degrees F.
 - 2. Provide heat and humidity control as needed to prevent damage to existing work and new work.
 - 3. Provide dust partitions as needed to prevent damage to existing work and new work.

1.07 CUTTING AND PATCHING

- A. Scope: Provide the necessary cutting, fitting and patching required to complete all elements of the Work including, but not limited to, the following procedures:
 - 1. To integrate with other work, to fit properly together.
 - 2. To uncover work to provide for installation of ill-timed work.
 - 3. To remove and replace defective and / or non-conforming work.
 - 4. To remove installed material for testing.
 - 5. To provide openings for penetration of mechanical and electrical work.

- B. Preparation: Prior to commencing cutting and patching, examine existing conditions (including structure and elements subject to movement) and advise Project Engineer in writing of any condition that could be adversely affected by cutting and patching.
 - 1. Submit written request in advance of cutting or alteration that affects:
 - a. Structural integrity of any element of the Project.
 - b. Integrity of weather-exposed or moisture-resistant element.
 - c. Efficiency, maintenance, or safety of any operational element.
 - d. Visual qualities of sight exposed elements.
 - e. Work of User or separate contractor.
 - 2. Include in the request:
 - a. Identification of Project.
 - b. Location and description of affected work.
 - c. Necessity for cutting or alteration.
 - d. Description of proposed work, and products to be used.
 - e. Alternatives to cutting and patching.
 - f. Effect on work of User or separate contractor.
 - g. Written permission of affected separate contractor.
 - h. Date and time work will be executed.
- C. Procedures: Perform cutting and patching as required in Part 3-Execution of this Section.
 - 1. Proceed only when permitted and after temporary supports and other devices are in place to ensure structural integrity and to protect other portions of the Project from damage.
 - 2. Execute work by methods to avoid damage to other Work, and which will provide appropriate surfaces to receive patching and finishing.
 - 3. Cut rigid materials using masonry saw or core drill. Pneumatic tools are not allowed without prior approval from the Project Engineer.
 - 4. Restore work with new products in accordance with requirements of the Contract Documents.
 - 5. Fit work air tight to pipes, sleeves, ducts, conduits and other penetrations through surfaces.
 - 6. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material, to full thickness of the penetrated element.
 - 7. Refinish surfaces to match adjacent finish. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.

1.08 WORK RESTRICTIONS

- A. Project participants shall not perform any work on any Sunday or any Legal Holidays (as defined in Section 3-3-7, Mississippi Code of 1972, Annotated) except as required by emergency conditions and approved by the Project Engineer.
- B. "No Smoking" shall be observed in the work areas.

PART 2 - PRODUCTS

2.01 SALVAGED MATERIALS

- A. Coordinate with Project Engineer in identifying salvageable materials. The Owner has first right of refusal for all items.

- B. Contractor shall take proper care in removing and placement where directed in designated area on Site.
- C. Salvage sufficient quantities of cut or removed material to replace damaged work of existing construction, when material is not readily obtainable on current market.
 - 1. Items not required for use in repair of existing work to remain shall be discarded if of no value to the Owner.
 - 2. Do not incorporate salvaged or used material in new construction unless approved in writing by the Project Engineer

2.02 PRODUCTS FOR PATCHING, EXTENDING AND MATCHING

- A. Provide products or types of construction same as in existing structure, as needed to patch, extend or match existing work to make work complete and consistent to standards of quality of connected and / or similar adjacent construction. Except otherwise indicated all products shall be new.
- B. Where Contract Documents do not define products or standards of workmanship in existing construction, Contractor shall determine products by inspection and any necessary testing, and upgrade by use of the existing as a sample of comparison.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that demolition is complete and areas are ready for beginning of repairing, refinishing and new construction.

3.02 PREPARATION

- A. Cut, move, or remove existing construction as necessary for access to alterations and renovations work; repair, replace, and restore where existing affected construction is to remain a part of final completed work.

3.03 ADJUSTMENTS

- A. Where partitions are removed, patch floors, walls, and ceilings for installation of new materials.
- B. Where removal of partition(s) results in adjacent spaces becoming one space, rework floor surfaces and ceilings to provide smooth planes without breaks, steps, or bulkheads.
- C. Where extreme change of plane occurs, request instructions from MDOT Architect as to method of making transition.
- D. Where new work adversely affects existing conditions beyond work limits defined, new work shall extend to facilitate proper joining and finishing of work.

3.04 DAMAGED SURFACES

- A. Patch and replace any portion of an existing finished surface which as a result of this construction, is found to be damaged, lifted, discolored, or shows other imperfections, with matching material.
 - 1. Provide adequate support of substrate prior to matching the finish.
 - 2. Refinish patched portions of painted or coated surfaces in a manner to produce uniform color and texture over entire surface
- B. Patch and replace any portion of an existing surface to be refinished as a finished surface that is found to be damaged, lifted, discolored or show imperfections that renders surface or substrate unsuitable for application of new finish material.
 - 1. Refinish patched portion to match existing adjacent surface in order to produce a uniform color and texture.
- C. Where new or existing wall is patched or damaged, the wall surface shall be patched and refinished from base to ceiling and end to end, or nearest natural break, and shall match new work in quality.

3.05 TRANSITION FROM EXISTING TO NEW WORK

- A. When new work abuts or finishes flush with existing work, make a smooth and workmanlike transition. Patched work shall match existing adjacent work in texture and appearance.
- B. When finished surfaces are cut in such a way that a smooth transition with new work is not possible, terminate existing surface in a neat manner along a straight line at a natural line of division.

3.06 CLEANING - PERIODIC AND FINAL

- A. General Requirements:
 - 1. Maintain the Project Space, including areas used for passage of Project personnel and materials, in a neat, clean and orderly condition at all times.
 - 2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for the Work.
 - 3. Provide adequate storage for all items awaiting removal from Site, observing all requirements for fire prevention and protection of the environment.
- B. Periodic Cleaning, as follows:
 - 1. Daily and more often if necessary, inspect the Project Space and pick up all scrap, debris, and waste material; remove to designated storage.
 - 2. At completion of work of each trade, clean area and make surfaces ready for work of successive trades.
 - 3. One each week, more often if necessary, remove all stored waste material and legally dispose of off the Site.
- C. Final Cleaning: Under provision of Section 01 74 19 – Construction Waste Management and Disposal.

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-assurance and -control services required by MDOT Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
 - 3. Specific test and inspection requirements are not specified in this Section.
- C. MDOT will provide the following inspections, sampling and testing at no cost to the Contractor:
 - 1. Section 03 20 00 "Concrete Reinforcing".
 - 2. Section 03 30 00 "Cast-In-Place Concrete".
 - 3. Section 31 23 12 "Excavation, Fill and Grading".
- D. The Contractor shall provide and pay for all other required inspection, sampling and testing.

1.02 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Project Engineer. Architect.
- C. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- D. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- E. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

- F. Installer / Applicator / Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
- G. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.03 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Project Engineer for a decision before proceeding.
- 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. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Project Engineer for a decision before proceeding.

1.04 INFORMATIONAL SUBMITTALS

- A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work.

1.05 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Materials will be inspected and sampled in accordance with current Mississippi Department of Transportation SOP pertaining to inspecting and sampling. Distribute copies of reports of inspections and tests to Project Engineer and one copy to the MDOT Architect. Include the following:
 1. Date of issue.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.

- B. Manufacturer's Field Reports: Prepare written information documenting tests and inspections specified in other Sections. Include the following:
 - 1. Name, address, and telephone number of representative making report.
 - 2. Statement on condition of substrates and their acceptability for installation of product.
 - 3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 - 4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 - 5. Other required items indicated in individual Specification Sections.
- C. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.06 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329 and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Manufacturer's Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
1. Contractor responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - d. When testing is complete, remove test specimens, assemblies, and mockups do not reuse products on Project, unless indicated otherwise in other Sections.
 2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Project Engineer, MDOT Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- J. Tolerances:
1. Walls: Finished wall surfaces shall be plumb and shall have a maximum variation of 1/8 inch in 8 feet when a straightedge is laid on the surface in any direction, and no measurable variation in any 2-foot direction.
 2. Ceilings: Finished ceiling surfaces shall present true, level, and plane surfaces, with a maximum variation of 1/8 inch in 8 feet when a straightedge and water level are laid on the surface in any direction and no measurable variation in any 2-foot direction.
 3. Concrete Floors: Tolerances for concrete floors and pavement are specified in Division 03.
 4. Finished Floors: Level to within plus or minus 1/8 inch in 10 feet for hardwood and resilient floor coverings.
- K. Protection of Wood:
1. Provide protection of all wood materials and products, whether or not installed, including erected and installed wood framing and sheathing, from water and moisture of any kind until completion and acceptance of the project.
 2. Keep informed of weather conditions and forecasts, and when there is a likelihood of rain, shall protect installed and exposed framing and sheathing and stored lumber exposed to the elements with suitable water-repellent coverings, such as canvas tarpaulins and polyethylene sheeting.
 3. Millwork and trim, paneling, cabinets, shelving, and products manufactured from wood shall be kept under cover and dry at the shop until time for delivery. Such materials shall not be delivered to the site until the building is roofed, and exterior walls are sheathed and protected with building paper as a minimum, the doors

and windows are installed and glazed, and there is ample interior storage space for such materials and products. Delivery shall not occur during periods of rain, heavy dew, or fog.

4. Wood materials or products which become wet from rain, dew, fog, or other source may be considered to have moisture damage and may be rejected, requiring replacement by the Contractor with new, dry materials or products at no increase in the Contract Price. Excepted materials: installed exterior wood siding, exterior wood trim, exterior wood doors, and exterior wood windows, after specified treatments, such as exterior wood stain or paint, have been applied.
- L. Grout Fill: In applications where the grout installation may be subjected to moisture, the manufacturer shall submit a letter stating that the entire grout matrix does not contain any of the following:
1. Added gypsum.
 2. Plaster-of-Paris
 3. Sulfur trioxide levels in a portland cement component exceeding ASTM C 150's published limits.

1.07 QUALITY CONTROL

- A. Owner Responsibilities: Where quality-control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services.
1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.
- B. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. Contractor shall not employ same entity engaged by Owner, unless agreed to in writing by Owner.
 2. Notify testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a manufacturer's representative to observe and inspect the Work. Manufacturer's representative's services include examination of substrates and conditions, verification of materials, inspection of completed portions of the Work, and submittal of written reports. The manufacturer shall inspect and approve the application or installation work at no additional cost to Contractor or the Owner.

1. The Contractor shall make all necessary arrangements with the manufacturer of the products to be installed to provide onsite consultation and inspection services to assure the correct application or installation of the product, system, or assembly.
 2. The manufacturer's authorized representative shall be present at the time any phase of this work is started.
 3. The manufacturer's authorized representative shall inspect and approve all surfaces over which, or upon which the manufacturer's product will be applied or installed.
 4. The manufacturer's representative shall make periodic visits to the site as the work proceeds as necessary for consultation and for expediting the work in the most practical manner.
- D. Retesting / Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with Project Engineer and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Project Engineer, MDOT Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.08 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Engage a qualified testing agency / special inspector to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner and as follows:
- B. Special Tests and Inspections: Conducted by a qualified testing agency / special inspector as required by authorities having jurisdiction, as indicated in individual Specification Sections and as follows:
 - 1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviews the completeness and adequacy of those procedures to perform the Work.
 - 2. Notifying Project Engineer, MDOT Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 3. Submitting a certified written report of each test, inspection, and similar quality-control service to Project Engineer, MDOT Architect with copy to Contractor and to authorities having jurisdiction.
 - 4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 - 6. Retesting and reinspecting corrected work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Project Engineer, MDOT Architect's and reference during normal working hours.

3.02 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION

SECTION 01 42 00

REFERENCES

PART 1 - GENERAL

1.01 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Reviewed": When used to convey MDOT Architect's action on Contractor's submittals, applications, and requests, "reviewed" is limited to MDOT Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Installer": An installer is Contractor or another entity engaged by Contractor, as an employee, subcontractor, or contractor of lower tier, to perform a particular construction operation, including installation, erection, application, and similar operations.
- J. "Experienced": The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
 - 1. Using a term such as "carpentry" does not imply that accredited or unionized individuals of a corresponding generic name, such as "carpenter", must perform certain construction activities. It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.
- K. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.02 INDUSTRY STANDARDS

A. Identification and Purpose:

1. Identification: Throughout the Contract Documents are references to nationally known and recognized Codes, Reference Standards, Reference Specifications, and similar documents that are published by Regulatory Agencies, Trade and Manufacturing Associations and Societies, Testing Agencies and others. References also include certain Project Documents or designated portions.
2. Purpose: All named and otherwise identified "Reference Standards" are "by reference" hereby incorporated into these Specifications as though fully written and hereby serve to establish specific requirements and pertinent characteristics for materials and workmanship as well as methods for testing / reporting on compliance thereto.

B. Procedures and Responsibilities:

1. Compliance with Laws and Codes of governmental agencies having jurisdiction shall be mandatory and take precedence over the requirements of all other Reference Standards. For products or workmanship specified by Associations, Trade, or Federal Standards, comply with the requirements of the standard, except when supplemented instructions indicate a more rigid standard and / or define more precise requirements.
 - a. Should specified reference standards conflict with regulatory requirements or the Contract Documents, request Project Engineer's / MDOT Architect's clarification before proceeding.
2. The Contractor (including any and all Parties furnishing and / or installing any portion of The Work) shall be familiar with the indicated codes and standards. It shall be the Contractor's responsibility to verify the detailed requirements of the specifically named codes and standards and to verify (and provide written certification, when required) that the items procured for use in this Work (and their installation, as applicable) meet or exceed the specified requirements.
3. The contractual relationship of the Parties to the Contract shall not be altered from the requirements of the Contract Documents by mention or inference otherwise in any reference document.

C. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated or when earlier editions are specifically required by Codes.

D. Copies of Standards: Each entity engaged in construction on Project should 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, obtain copies directly from publication source.

1.03 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association

AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists
ACI	American Concrete Institute (Formerly: ACI International)
ACPA	American Concrete Pipe Association
AEIC	Association of Edison Illuminating Companies, Inc. (The)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AHAM	Association of Home Appliance Manufacturers
AHRI	Air-Conditioning, Heating, and Refrigeration Institute (The)
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Movement and Control Association International, Inc.
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts, Inc.
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
ARI	Air-Conditioning & Refrigeration Institute (See AHRI)
ARI	American Refrigeration Institute (See AHRI)
ASCE	American Society of Civil Engineers
ASCE/SEI	American Society of Civil Engineers/Structural Engineering Institute (See ASCE)
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	ASME International (American Society of Mechanical Engineers)
ASSE	American Society of Safety Engineers (The)
ASSE	American Society of Sanitary Engineering
ASTM	ASTM International (American Society for Testing and Materials International)
ATIS	Alliance for Telecommunications Industry Solutions

AWI	Architectural Woodwork Institute
AWPA	American Wood Protection Association (Formerly: American Wood-Preservers' Association)
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association)
CFFA	Chemical Fabrics & Film Association, Inc.
CFSEI	Cold-Formed Steel Engineers Institute
CGA	Compressed Gas Association
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CRI	Carpet and Rug Institute (The)
CRRC	Cool Roof Rating Council
CRSI	Concrete Reinforcing Steel Institute
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Construction Specifications Institute (The)
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
CWC	Composite Wood Council (See CPA)
DASMA	Door and Access Systems Manufacturers Association
DHI	Door and Hardware Institute
ECA	Electronic Components Association
ECAMA	Electronic Components Assemblies & Materials Association (See ECA)
EIA	Electronic Industries Alliance (See TIA)
ESD	ESD Association (Electrostatic Discharge Association)

EVO	Efficiency Valuation Organization
FM Approvals	FM Approvals LLC
FM Global	FM Global (Formerly: FMG - FM Global)
FSA	Fluid Sealing Association
GA	Gypsum Association
GANA	Glass Association of North America
HI	Hydraulic Institute
HI/GAMA	Hydronics Institute/Gas Appliance Manufacturers Association (See AHRI)
HMMA	Hollow Metal Manufacturers Association (See NAAMM)
HPVA	Hardwood Plywood & Veneer Association
IAPSC	International Association of Professional Security Consultants
IAS	International Approval Services (See CSA)
ICC	International Code Council
ICEA	Insulated Cable Engineers Association, Inc.
ICPA	International Cast Polymer Alliance
ICRI	International Concrete Repair Institute, Inc.
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IES	Illuminating Engineering Society (Formerly: Illuminating Engineering Society of North America)
IESNA	Illuminating Engineering Society of North America (See IES)
IEST	Institute of Environmental Sciences and Technology
IGMA	Insulating Glass Manufacturers Alliance
IGSHPA	International Ground Source Heat Pump Association
Intertek	Intertek Group (Formerly: ETL SEMCO; Intertek Testing Service NA)
ISA	International Society of Automation (The) (Formerly: Instrumentation, Systems, and Automation Society)
ISAS	Instrumentation, Systems, and Automation Society (The) (See ISA)
ISFA	International Surface Fabricators Association (Formerly: International Solid Surface Fabricators Association)

ISO	International Organization for Standardization
ISSFA	International Solid Surface Fabricators Association (See ISFA)
ITU	International Telecommunication Union
LMA	Laminating Materials Association (See CPA)
LPI	Lightning Protection Institute
MBMA	Metal Building Manufacturers Association
MCA	Metal Construction Association
MFMA	Metal Framing Manufacturers Association, Inc.
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
MMPA	Moulding & Millwork Producers Association (Formerly: Wood Moulding & Millwork Producers Association)
MPI	Master Painters Institute
MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NACE	NACE International (National Association of Corrosion Engineers International)
NADCA	National Air Duct Cleaners Association
NAIMA	North American Insulation Manufacturers Association
NBGQA	National Building Granite Quarries Association, Inc.
NCMA	National Concrete Masonry Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFPA	NFPA (National Fire Protection Association)
NFRC	National Fenestration Rating Council
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	National Oak Flooring Manufacturers Association (See NWFA)

NOMMA	National Ornamental & Miscellaneous Metals Association
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association
NSF	NSF International (National Sanitation Foundation International)
NSPE	National Society of Professional Engineers
NSSGA	National Stone, Sand & Gravel Association
NTMA	National Terrazzo & Mosaic Association, Inc. (The)
PCI	Precast/Prestressed Concrete Institute
PDI	Plumbing & Drainage Institute
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
SBCCI	Southern Building Code Congress International, Inc. (See ICC)
SCTE	Society of Cable Telecommunications Engineers
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEI/ASCE	Structural Engineering Institute/American Society of Civil Engineers (See ASCE)
SIA	Security Industry Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPFA	Spray Polyurethane Foam Alliance
SPIB	Southern Pine Inspection Bureau
SRCC	Solar Rating and Certification Corporation
SSINA	Specialty Steel Industry of North America
SSPC	SSPC: The Society for Protective Coatings
SWPA	Submersible Wastewater Pump Association
TCNA	Tile Council of North America, Inc.
TIA	Telecommunications Industry Association (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance)
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance (See TIA)

UBC	Uniform Building Code (See ICC)
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
WASTEC	Waste Equipment Technology Association
WDMA	Window & Door Manufacturers Association
WI	Woodwork Institute (Formerly: WIC - Woodwork Institute of California)
WMMPA	Wood Moulding & Millwork Producers Association (See MMPA)
WWPA	Western Wood Products Association

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

DIN	Deutsches Institut fur Normung e.V.
IAPMO	International Association of Plumbing and Mechanical Officials
ICC	International Code Council
ICC-ES	ICC Evaluation Service, LLC

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.

COE	Army Corps of Engineers
CPSC	Consumer Product Safety Commission
DOC	Department of Commerce National Institute of Standards and Technology
DOE	Department of Energy
EPA	Environmental Protection Agency
FG	Federal Government Publications
GSA	General Services Administration
HUD	Department of Housing and Urban Development
LBL	Lawrence Berkeley National Laboratory Environmental Energy Technologies Division
OSHA	Occupational Safety & Health Administration
TRB	Transportation Research Board National Cooperative Highway Research Program

USDA Department of Agriculture
Agriculture Research Service
U.S. Salinity Laboratory

USDA Department of Agriculture
Rural Utilities Service

USDJ Department of Justice
Office of Justice Programs
National Institute of Justice

USPS United States Postal Service

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list.

CFR Code of Federal Regulations
Available from Government Printing Office

DOD Department of Defense
Military Specifications and Standards
Available from Department of Defense Single Stock Point

FED-STD Federal Standard (See FS)

FS Federal Specification
Available from Department of Defense Single Stock Point

Available from Defense Standardization Program

Available from General Services Administration

Available from National Institute of Building Sciences/Whole Building Design Guide

MILSPEC Military Specification and Standards (See DOD)

USAB United States Access Board

USATBCB U.S. Architectural & Transportation Barriers Compliance Board (See USAB)

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 45 29

TESTING AND INSPECTION SERVICES – MDOT

PART 1 - GENERAL

1.01 SUMMARY

- A. Scope: The Contractor shall use testing laboratory services of the Mississippi Department of Transportation for all testing required in this Section. These services will be provided to the Contractor by the MDOT at no charge. Use of said services shall in no way relieve the Contractor of his obligation to perform Work in accordance with the Contract.
- B. Inspection, Sampling and Testing are required for:
 - 1. Section 03 20 00, Concrete Reinforcing.
 - 2. Section 03 30 00, Cast-In-Place Concrete.

1.02 LABORATORY'S DUTIES

- A. Materials will be inspected and sampled in accordance with current Mississippi Department of Transportation SOP pertaining to inspecting and sampling.
- B. Prepare reports of inspections and tests including:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory, name and address.
 - 4. Name and signature of inspector.
 - 5. Date of inspection or sampling.
 - 6. Record of temperature and weather.
 - 7. Date of test.
 - 8. Identification of product and Specification Section.
 - 9. Location of project.
 - 10. Type inspection or test.
 - 11. Observations regarding compliance with Contract Documents requirements.
- C. Distribute copies of reports of inspections and tests to Project Engineer and one copy to the MDOT Architect.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel to provide to laboratory in required quantities preliminary representative samples of materials to be tested.
- B. When required, furnish copies of mill test reports. Furnish to laboratory, casual labor to obtain and handle samples at the site and to facilitate inspections and tests.
- C. Provide facilities for laboratory's exclusive use for storage and curing of test samples.
- D. Notify laboratory in advance of operations to allow for assignment of personnel and scheduling of tests.

1.04 MATERIAL CERTIFICATIONS AND CERTIFIED TEST REPORTS

- A. All certifications shall meet the following requirements:
 - 1. Have letterhead of the manufacturer, producer, supplier, or fabricator.
 - 2. Include the project number.
 - 3. Itemized list of materials covered by the certification.
 - 4. Contain a material conformance statement, which certifies that the materials conform to the specific specification requirements.
 - 5. Certification for all steel and steel wire products must also include a certified statement by the manufacturer that all of the manufacturing processes are of domestic origin.
 - 6. Signature of a responsible company official.

- B. All certified test reports shall meet the following requirements:
 - 1. Have letterhead of the manufacturer, producer, supplier, or fabricator
 - 2. Include name and description of material, lot, batch, or heat number, etc., as applicable.
 - 3. Show results of each required test, and state that the test was run according to the test method specified.
 - 4. Test method specified statement by the manufacturer that all of the manufacturing processes are of domestic origin.
 - 5. Signature of a responsible laboratory official.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for work restrictions and limitations on utility interruptions.

1.02 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Project Engineer, occupants of Project, testing agencies, and authorities having jurisdiction.
- B. Water and Sewer Service from Existing System: 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 from Existing System: 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.

1.03 INFORMATIONAL SUBMITTALS

- A. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire prevention program.

1.04 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- C. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.

1.05 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.01 TEMPORARY FACILITIES

- A. **Field Offices:** The Contractor is not required to furnish a field office, but shall provide at the job site duplicates of all correspondence, shop drawings, plans, specifications, samples, etc. required to administer the Project. These duplicates will be permanently kept as reference and shall not be used in the field. Contractor shall provide the Project Engineer and the MDOT Architect with job site and emergency telephone numbers.
- B. **Storage and Fabrication Sheds:** It shall be the Contractor's option to provide watertight storage facilities for storage of cement, lime, and / or other materials subject to water damage. If storage facilities are used, it shall be of sufficient size to hold all materials required for logically grouped activities on the site at one time, and shall have floors raised at least 6 inches above the ground on heavy joists or sleepers. Fully enclosed trailer is allowed, but location must be coordinated with Project Engineer.

2.02 EQUIPMENT

- A. **Fire Extinguishers:** Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. **HVAC Equipment:** Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. **Heating Units:** Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. **Permanent HVAC System:** If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 "Closeout Procedures".

PART 3 - EXECUTION

3.01 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.
 - 1. **Locate facilities** to limit site disturbance as specified in Section 01 10 00 "Summary."
- 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.
- C. **Powder Actuated Tools:** The use of powder actuated tools shall be prohibited from use during all phases of the construction, unless explicitly approved in writing, prior to construction, by the Project Engineer.

3.02 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.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to system indicated as directed by authorities having jurisdiction.
- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.
- E. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Toilets: Use of Owner's existing toilet facilities may be permitted, if acceptable with the Project Engineer, and as long as facilities are cleaned and maintained in a condition acceptable to Owner. At Final Completion, restore these facilities to condition existing before initial use.
- F. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
 - 1. Install electric power service overhead unless otherwise indicated.
 - 2. Connect temporary service to Owner's existing power source, as directed by Owner.
- I. 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.
- J. Telephone Service: Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

3.03 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
 - 2. Maintain support facilities until Project Engineer schedules Final Completion inspection. Remove before Final Completion. Personnel remaining after Final Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. 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.
 - 3. The drive is to remain open at all times. A flagman will be required to control traffic when construction vehicles are present.
- C. Parking: Use designated areas of Owner's existing parking areas for construction personnel.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
 - 2. Remove snow and ice as required to minimize accumulations.
- E. Project Signs: Unauthorized signs are not permitted.
- F. Waste Disposal Facilities: Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."
- G. 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.

3.04 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- C. Environmental Protection Procedures: Designate one person, the Construction Superintendent or other, to enforce strict discipline on activities related to generation of wastes, pollution of air/water/soil, generation of noise, and similar harmful or deleterious effects which might violate regulations or reasonably irritate persons at or in vicinity of Project Site.

- D. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
 - E. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
 - F. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.
 - G. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is not complete, insulate temporary enclosures.
 - H. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by Owner from fumes and noise.
 - 1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant-treated plywood on construction operations side.
 - 2. Where fire-resistance-rated temporary partitions are indicated or are required by authorities having jurisdiction, construct partitions according to the rated assemblies.
 - 3. Insulate partitions to control noise transmission to occupied areas.
 - 4. Seal joints and perimeter. Equip partitions with gasketed dustproof doors and security locks where openings are required.
 - 5. Protect air-handling equipment.
 - 6. Provide walk-off mats at each entrance through temporary partition.
 - I. 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; manage fire prevention program.
 - 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.
- 3.05 MOISTURE AND MOLD CONTROL
- A. Contractor's Moisture Protection Plan: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
 - B. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 2. Keep interior spaces reasonably clean and protected from water damage.
 3. Discard or replace water-damaged and wet material.
 4. Discard, replace, or clean stored or installed material that begins to grow mold.
 5. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.
- C. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Remove materials that cannot be completely restored to their manufactured moisture level within 72 hours.
- 3.06 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. Burning of Trash: No burning of trash or debris shall be done on Owner's property. All such materials shall be removed from the site and disposed of in accordance with local laws and ordinances.
- C. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- D. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Final Completion.
- E. Conduct of workers: Workmen, who, because of improper conduct or persistent violation of Owner's requirements, become objectionable, shall be removed at the Owner's request. Inform all workmen of Owner's requirements.
- F. 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 Final 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.
 2. At Final Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements: Section 01 25 00 "Substitution Procedures" for requests for substitutions.

1.02 DEFINITIONS

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

1.03 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. MDOT Architect's Action: If necessary, MDOT Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. MDOT Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or ten days of receipt of additional information or documentation, whichever is later.
 - a. Form of Approval: As specified in Section 01 33 00 "Submittal Procedures."
 - b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.04 QUALITY ASSURANCE

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

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

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

- B. Delivery and Handling:

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

- C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.06 PRODUCT WARRANTIES

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

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
 - 1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3. Refer to other Sections for specific content requirements and particular requirements for submitting special warranties.

- C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.01 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," MDOT Architect will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

- B. Product Selection Procedures:
 - 1. Products specified only by reference standards, select any product meeting standards by any manufacturer.
 - 2. Products specified by naming several (minimum of three) products or manufacturers, select any product and manufacturer named. Contractor must submit request, as required for substitution, for any product not specifically named and GIVE REASONS for not using product specified. Substitutions WILL NOT be granted unless reasons are considered justified.
 - 3. Products specified by naming one or more products, but indicating the option of selecting equivalent products by stating "or approved equal" after specified product, Contractor must submit request, as required for substitution, for any product not specifically named.
 - 4. Products specified by naming only one product and manufacturer, an equivalent product will always be accepted if it is equal in all respects (size, shape, texture, color, etc.). The Contractor must submit a request for substitution as set forth in this section.
 - 5. Products specified by naming only one product and manufacturer and stating no substitutions will be accepted, there is no option and no substitutions will be allowed.

- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 01 25 00 "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.02 COMPARABLE PRODUCTS

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

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 01 73 00

EXECUTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.
6. Correction of the Work.

B. Related Requirements:

1. Section 01 10 00 "Summary" for limits on use of Project site.
2. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
3. Section 07 84 00 "Firestopping" for patching penetrations in fire-rated construction.

1.02 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Project Engineer of locations and details of cutting and await directions from Project Engineer before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
2. 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.
3. Other Construction Elements: Do not cut and patch other construction elements or 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
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in MDOT Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

2.01 MATERIALS

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

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 - 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 - 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 - 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 - 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.02 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and the Project Engineer that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect according to requirements in Section 01 31 00 "Project Management and Coordination."

3.03 INSTALLATION

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

3.04 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Adjacent Occupied Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- F. 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 minimize interruption to occupied areas.
- G. 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 neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 - 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 - 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 - 6. Proceed with patching after construction operations requiring cutting are complete.
- H. 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 practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
 - 1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical 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 minimize evidence of patching and refinishing.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.05 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways.

- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.06 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- D. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements"

3.07 PROTECTION OF INSTALLED CONSTRUCTION

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

END OF SECTION

SECTION 01 74 19

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.01 SUMMARY

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

- B. Related Requirements:
 - 1. Section 02 41 19 "Selective Structure Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
 - 2. Section 31 23 11 "Excavation, Fill and Grading for Building" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.02 DEFINITIONS

- A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

- B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

- C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

- D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

1.03 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 15 days of date established for the Notice to Proceed.

1.04 INFORMATIONAL SUBMITTALS

- A. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.05 QUALITY ASSURANCE

- A. Waste Management Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination."

1.06 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section.
- B. Waste Reduction Work Plan: List each type of waste and whether it will be recycled or disposed of in landfill or incinerator.
 - 1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 3. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project.
- C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.
 - 1. Distribute waste management plan to everyone concerned within five days of submittal return.
 - 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
- D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 - 2. Comply with Section 01 50 00 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.02 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL

- A. General: Recycle paper and beverage containers used by on-site workers.
- B. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.03 RECYCLING DEMOLITION WASTE

- A. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- B. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- D. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- E. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- F. Carpet: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- G. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- H. Conduit: Reduce conduit to straight lengths and store by type and size.

3.04 RECYCLING CONSTRUCTION WASTE

A. Packaging:

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

B. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

C. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location.

1. Clean Gypsum Board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.

3.05 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

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

- B. Related Requirements:
 - 1. Section 01 32 33 "Photographic Documentation" for submitting final completion construction photographic documentation.
 - 2. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
 - 3. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 4. Section 01 79 00 "Demonstration and Training" for requirements for instructing Owner's personnel.

1.02 FINAL INSPECTIONS

- A. Engineer and Architect's Inspection: The Contractor shall make written request for a Final Inspection to the Project Engineer and MDOT Architect. Notice is to be given 10 calendar days prior to this inspection. At the day of inspection, the Contractor shall have in hand 6 copies of the HVAC Test and Balance Report, Reference Specification Sections in Division 23 and 6 copies of a list prepared by the Contractor of deficiencies, which will be edited by the Project Engineer, MDOT Architect and Consultants. A copy of these composite lists will be given to the Contractor for correcting the Work. Within 15 calendar days after this revised list is received, the Contractor shall make all corrections of the items listed. If, in the Project Engineer and MDOT Architect's judgment, the Project is not ready for an Inspection, the Project Engineer may schedule another inspection.

- B. Owner's Inspection: After the Project Engineer and MDOT Architect have determined the Project to be Complete and all punch list items have been corrected, an Owner's Inspection will be scheduled. The Contractor shall submit a letter that states all items have been corrected and submit required closeout Documents. The Owners may add to the punch list items; if it is determined that corrective work still needs to be done. Within 15 calendar days after this revised list is received, the Contractor shall make all corrections of the items listed.

- C. Correction of Work before Final Payment: Contractor shall promptly remove from the Owner's premises, all materials condemned for failure to conform to the Contract, whether incorporated in Work or not, and Contractor shall, at his own expense, replace such condemned materials with those conforming to the requirements of the Contract. Failure to remedy such defects after 10 days written notice will allow the Owner to make good such defects and such costs shall be deducted from the balance due the Contractor or charged to the Contractor in the event no payment is due.

- D. Should additional inspections by the MDOT Architect's Consultants of the Work be required due to failure of the Contractor to remedy defects listed, the Project Engineer may deduct the expense of additional Consultants inspections from the Contract Sum in the Owner / Contractor Agreement. The additional expense will be based on the rate shown for services in the Consultants' Architect or Engineering Services Contract.

1.03 FINAL ACCEPTANCE

- A. The Mississippi Department of Transportation does not recognize the term "Substantial Completion". The Project Engineer shall determine when the building is complete to the point it can be used for its intended purpose and occupied. This date shall be the Date of Completion.
- B. Final Payment shall not be made until items covered in Closeout Procedures are satisfied. This date shall be the Date of Final Acceptance.

1.04 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: All Warranties and Extended Warranties shall use this Date of Completion as the starting date of Warranty Period.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.

1.05 CLOSEOUT DOCUMENTS

- A. Unless otherwise notified, the Contractor shall submit to the Owner through the Project Engineer to the MDOT Architect 2 copies the following before final payment is made:
 - 1. Request for Final Payment: AIA Document G702, current edition, completed in full or a computer generated form having similar data.
 - 2. Contractor's Affidavit of Payment of Debts and Claims: AIA Document G706, current edition, completed in full.
 - 3. Release of Liens and Certification that all Bills Have Been Paid: AIA Document G706A, current edition, completed in full or a sworn statement and affidavit from the Contractor to the Owner stating that all bills for this project have been paid and that the Owner is released from any and all claims and / or damages.
 - 4. Consent of Surety Company to Final Payment: AIA Document G707, current edition, completed in full by the Bonding Company.
 - 5. Power of Attorney: Closeout Documents should be accompanied by an appropriate Power of Attorney.

6. Guarantee of Work: Sworn statement that all Work is asbestos free and guaranteed against defects in materials and workmanship for one year from Date of Completion, except where specified for longer periods.
 - a. Word the guaranty as follows: "We hereby guarantee all Work performed by us on the above captioned Project to be free from asbestos and defective materials. We also guarantee workmanship for a period of one (1) year or such longer period of time as may be called for in the Contract Documents for such portions of the Work".
 - b. All guarantees and warranties shall be obtained in the Owner's name.
 - c. Within the guaranty period, if repairs or changes are requested in connection with guaranteed Work which, in the opinion of the Owner, is rendered necessary as a result of the use of materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the Contract, the Contractor shall promptly, upon receipt of notice from and without expense to the Owner, place in satisfactory condition in every particular, all such guaranteed Work, correct all defects wherein and make good all damages to the building, site, equipment or contents thereof which, in the opinion of the Owner, is the result of the use of materials, equipment, or workmanship which are inferior, defective or not in accordance with the terms of the Contract; and make good any Work or materials or the equipment and contents of said buildings or site disturbed in fulfilling any such guaranty.
 - d. If, after notice, the Contractor fails to proceed promptly to comply with the terms of the guaranty, the Owner may have the defects corrected and the Contractor and his sureties shall be liable for all expense incurred.
 - e. All special guaranties applicable to definite parts of the Work stipulated in the Project Manual or other papers forming part of the Contract shall be subject to the terms of this paragraph during the first year of the life of such special guaranty.
7. Project Record Documents: Furnish all other record documents as set forth in Section 01 78 39 - Project Record Documents.
 - a. Provide all certificates, warranties, guarantees, bonds, or documents as called for in the individual Sections of the Project Manual. The Contractor is responsible for examining the Project Manual for these requirements.
8. Additional Documents Specified Within the Project Manual:
 - a. General Provide all Operational and Maintenance documents as called for in the individual Sections of the Project Manual. The Contractor is responsible for examining the Project Manual for these requirements.
 - b. Maintenance Stock: Deliver to Owner all required additional maintenance materials as required in the various Sections of the Specifications.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting Engineer and Architect final inspection.
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - k. Remove labels that are not permanent.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - n. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - o. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - p. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Section 01 50 00 "Temporary Facilities and Controls." Prepare written report.

3.02 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting Final Inspection.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.
 - 1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
 - 2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
 - 3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
 - 4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.

1.02 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is specified in individual Specification Sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. MDOT Architect will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. PDF electronic file. Assemble each manual into a composite electronically indexed file. Submit on digital media acceptable to MDOT Architect.
 - a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically linked operation and maintenance directory.
 - b. Enable inserted reviewer comments on draft submittals.
 - 2. Three paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. MDOT Architect will return one copy.
- C. Manual Submittal: Submit each manual in final form prior to requesting Final Inspection and at least 15 days before commencing demonstration and training. MDOT Architect will return one copy with comments.
 - 1. Correct or revise each manual to comply with MDOT Architect's comments. Submit two copies of each corrected manual within 15 days of receipt of MDOT Architect's comments and prior to commencing demonstration and training.

PART 2 - PRODUCTS

2.01 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information.
- B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- C. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Contractor.
 - 6. Name and contact information for Architect.
 - 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 - 8. Cross-reference to related systems in other operation and maintenance manuals.
- D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
 - 2. File Names and Bookmarks: Enable bookmarking of individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.

- G. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents, and indicate Specification Section number(s) on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.02 EMERGENCY MANUALS

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

4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.03 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.
10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

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

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

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

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

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

2.04 PRODUCT MAINTENANCE MANUALS

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

- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds. Include procedures to follow and required notifications for warranty claims.

2.05 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.

2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Schedule Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.01 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original project record documents as part of operation and maintenance manuals.
 - 2. Comply with requirements of newly prepared Record Drawings in Division 01 Section 01 78 39 "Project Record Documents."
- F. Comply with Section 01 77 00 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings.
 - 2. Record Project Manual (Proposal)
 - 3. Record Product Data.
- B. Related Requirements:
 - 1. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.02 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of record Drawings as follows:
 - a. Submittal:
 - 1) Submit PDF electronic files of scanned record prints and two set(s) of marked-up record prints.
 - 2) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Project Manual (Proposal): Submit two paper copies and one annotated PDF electronic files of Project Manual (Proposal), including addenda and contract modifications.
- C. Record Product Data: Submit two paper copies and one annotated PDF electronic files and directories of each submittal.

PART 2 - PRODUCTS

2.01 RECORD DRAWINGS

- A. Record Prints: Maintain two sets of marked-up paper copies of the Contract Drawings (half-size) and Shop Drawings, incorporating new and revised Drawings as modifications are issued.
 - 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Record data as soon as possible after obtaining it.
 - c. Record and check the markup before enclosing concealed installations.

2. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 3. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 4. Note Construction Change Directive numbers, alternate numbers, Change Order (Supplemental Agreements) numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Final Completion review marked-up record prints with Project Engineer and MDOT Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Annotated PDF electronic file.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Project Engineer and MDOT Architect for resolution.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Consulting Architect (if applicable).
 - e. Name of Contractor.
- 2.02 RECORD PROJECT MANUAL (PROPOSAL)

- A. Preparation: Mark Project Manual (Proposal) to indicate the actual product installation where installation varies from that indicated in the Technical Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. Note related Change Orders (Supplemental Agreements), record Product Data, and record Drawings where applicable.
- B. Format: Submit record Project Manual (Proposal) as scanned PDF electronic file(s) of marked-up paper copy of Project Manual (Proposal).

2.03 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 - 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 - 3. Note related Change Orders (Supplemental Agreements), record Specifications, and record Drawings where applicable.
- B. Format: Submit record Product Data as scanned PDF electronic file(s) of marked-up paper copy of Product Data.

PART 3 - EXECUTION

3.01 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Project Engineer's and MDOT Architect's reference during normal working hours.
- C. The information, except Contract Drawings, shall be arranged and labeled by corresponding Specification Section, neatly bound in three ring binders, indexed, and all shop drawings readable without being removed or unstapled.
- D. The name and address of each subcontractor and material supplier shall be listed in front of each binder along with the Project Manual (Proposal).
- E. Sufficient information, such as as-built control drawings for air handling system and variable drive controls, shall be furnished to allow qualified personnel to service equipment.

END OF SECTION

SECTION 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.

1.02 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

1.03 CLOSEOUT SUBMITTALS

- A. Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.
 - 1. At completion of training, submit complete training manual(s) for Owner's use prepared and bound in format matching operation and maintenance manuals.

1.04 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.
- C. Preinstruction Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to demonstration and training.

1.05 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations and to ensure availability of Owner's personnel.

- B. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.01 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Contractor is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 - 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 - 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 - 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for emergencies.
 - j. Operating procedures for system, subsystem, or equipment failure.
 - k. Seasonal and weekend operating instructions.

- l. Required sequences for electric or electronic systems.
- m. Special operating instructions and procedures.
- 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
- 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
- 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
- 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."

3.02 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Owner will furnish Contractor with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner, through Project Engineer, with at least seven days' advance notice.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

- E. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

3.03 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.
 - 1. At beginning of each training module, record each chart containing learning objective and lesson outline.
- B. Video Recording Format: Provide high-quality color video recordings with menu navigation in format acceptable to Project Engineer and MDOT Architect.
- C. Narration: Describe scenes on video recording by dubbing audio narration off-site after video recording is recorded. Include description of items being viewed.
- D. Preproduced Video Recordings: Provide video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION

SECTION 01 91 13

GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. OPR and BoD documentation are included by reference for information only.

1.02 SUMMARY

- A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components.
- B. Related Sections:
 - 1. Section 23 08 00 "Commissioning of HVAC" for commissioning process activities for HVAC&R systems, assemblies, equipment, and components.

1.03 DEFINITIONS

- A. BoD: Basis of Design. A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- B. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- C. CxA: Commissioning Authority.
- D. OPR: Owner's Project Requirements. A document that details the functional requirements of a project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
- E. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.04 COMMISSIONING TEAM

- A. Members Appointed by Contractor: Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, representatives of Contractor, including Project superintendent and subcontractors, installers, suppliers, and specialists deemed appropriate by the Project Engineer and MDOT Architect.
- B. Members Appointed by Owner:
 - 1. Representatives of the facility user and operation and maintenance personnel.
 - 2. Architect and engineering design professionals.

1.05 OWNER'S RESPONSIBILITIES

- A. Provide the OPR documentation to the Contractor for information and use.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.
- C. Provide the BoD documentation, prepared by MDOT Architect and approved by Owner, to the Contractor for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.

1.06 CONTRACTOR'S RESPONSIBILITIES

- A. Contractor shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
 - 1. Provide commissioning plan.
 - 2. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 - 3. Attend commissioning team meetings held on a monthly basis.
 - 4. Integrate and coordinate commissioning process activities with construction schedule.
 - 5. Review and accept construction checklists provided by the MDOT Architect.
 - 6. Complete paper or electronic (preferred) construction checklists as Work is completed and provide to the Project Engineer and MDOT Architect on a weekly basis.
 - 7. Complete commissioning process test procedures.

1.07 PROJECT ENGINEER'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Convene commissioning team meetings.
- C. Verify the execution of commissioning process activities.. Verification will include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports to verify compliance with the OPR.
- D. Witness systems, assemblies, equipment, and component startup.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 02 41 19

SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. Extent of demolition Work is indicated on Drawings. Demolition requires selective removal and subsequent offsite disposal. The building will be vacated and furniture removed prior to demolition.
- B. Types of Demolition Work include, but are not limited to the following items:
 - 1. Portions of building structure indicated on Drawings and as required to accommodate new construction.
 - 2. Removal of all or portions of interior partitions as indicated on Drawings.
 - 3. Removal of doors and frames indicated "remove".
 - 4. Protection of existing fixtures and equipment items indicated "Existing To Remain".

1.02 DEFINITIONS

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

1.03 PRE-INSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Pre-demolition Photographs or Video: Submit before Work begins.
- C. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.05 QUALITY ASSURANCE

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

1.06 FIELD CONDITIONS

- A. Building tenants will vacate the building for the duration of the renovation.
- 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: See 00 31 26 Asbestos Report for extent of hazardous materials encountered in the existing building.
 - 1. Hazardous materials will not be removed and should not be disturbed.
 - 2. If additional suspected hazardous materials are encountered, do not disturb; immediately notify Project Engineer and MDOT Architect.
 - E. Storage or sale of removed items or materials on-site is not permitted.
 - F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.
- 1.07 WARRANTY
- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

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

PART 3 - EXECUTION

3.01 EXAMINATION

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

3.02 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services / systems indicated to remain and protect them against damage.
 - 1. Comply with requirements for existing services / systems interruptions specified in Section 01 10 00 "Summary."

- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
 - 2. Arrange to shut off indicated 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 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.
 - 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.

- C. Refrigerant: Remove refrigerant from mechanical equipment to be selectively demolished according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.03 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."

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

- C. Temporary Shoring: 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.

3.04 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 5. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- B. Reuse of Building Elements: Do not demolish building elements beyond what is indicated on Drawings without Architect's approval.
- C. 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.

3.05 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
 - 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 19 "Construction Waste Management and Disposal."
- B. Burning: Do not burn demolished materials.

3.06 CLEANING

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

END OF SECTION

SECTION 03 10 00 CONCRETE FORMING AND ACCESSORIES

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes all concrete formwork and other related items necessary to complete project indicated by Contract Documents unless specifically excluded.
- B. Related Sections:
 - 1. Section 03 20 00 – Concrete Reinforcing.
 - 2. Section 03 30 00 – Cast-in-Place Concrete.

1.02 PROJECT CONDITIONS

- A. Examine the substrate over which concrete forms are installed and advise the Project Engineer of conditions detrimental to the installation of concrete formwork. Do not proceed until unsatisfactory conditions have been corrected.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Wood Forms: 3/4 inch thick exterior grade plywood on studs and joists.
- B. Form Ties: Standard snap ties, 1-1/2 inch break-back.
- C. Form Oil: Oil must not affect bonding of finishes on exposed concrete. Approved non-staining type as follows:
 - 1. Nox-Crete Products Group Nox-Crete Form Coating EB.
 - 2. SEI Form Release Gcc-100.
 - 3. Dayton Superior Bio-Release EF.

PART 3 - EXECUTION

3.01 FORMWORK

- A. Forms shall be properly aligned, adequately braced and mortar tight to produce concrete shapes required by Drawings.
 - 1. Align forms so that the actual surface does not vary from true surface more than 1/8 inch.
 - 2. The surface shall be clean, undamaged, and free of offsets and irregularities at joints.
 - 3. Adequately brace and frame to retain true shapes under vibration and placing strains without leaks, bowing, or deflection.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

- C. Studs, girts, and walls shall not be less than 2 by 4's, S4S, construction of standard grade Douglas fir, or equal, selected for straightness.
 - 1. Walls shall consist of at least two 2 by 4's.
 - 2. Studs shall not be spaced more than 16 inches, girts not more than 24 inches and ties not more than 27 inches, on center.
 - D. Lightly oil wood forms prior to placing reinforcing, and with oil not permitted on the reinforcing. Where oil form is used, remove excess before pouring concrete.
 - E. Unless indicated otherwise, chamfer exterior corners and edges of permanently exposed concrete.
 - F. Comply with recommendations of "Recommended Practice for Concrete Form work" ACI 347 unless indicated otherwise.
- 3.02 INSERTS AND FASTENING DEVICES FOR OTHER WORK
- A. Provide for installation of inserts, hangers, metal ties, anchors, bolts, dowels, nailing strips, grounds and other fastening devices required for attachment of other Work
 - B. Locate partitions for other trades prior to pouring concrete in order that conduits, sleeves and inserts required by others will be installed in the proper locations.
 - C. Do not install sleeves in any concrete beams or piers except upon approval of the Project Engineer.
 - D. Do not install aluminum conduits in concrete.
- 3.03 VAPOR RETARDERS
- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Lap joints 6 inches and seal with manufacturer's recommended tape. Refer to Section 07 26 00 – Vapor Retarders.
- 3.04 FORM REMOVAL
- A. Grade beam and column forms may be removed 24 hours after a pour is completed.
 - B. Floor slab wood forms may be removed 10 days after pour, providing compressive strength has reached a minimum of 2500 psi based on job cast cylinders.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes all concrete reinforcing and the related items necessary to complete the Project indicated by the Contract Documents unless specifically excluded.
- B. Related Sections:
 - 1. Section 03 10 00 – Concrete Forming and Accessories.
 - 2. Section 03 30 00 – Cast-in-Place Concrete.

1.02 SUBMITTALS

- A. Submit reinforcing steel shop drawings and materials list prior to placement for MDOT Architect's approval.
 - 1. Shop drawings shall include complete DIMENSIONED placing plans including control joint locations, order lists, bend diagrams, and DETAILS SHOWING DIMENSIONS WITH CLEARANCES.
 - 2. Submittals not including this requirement will be considered as an incomplete submittal and will be returned to Contractor for re-submittal.
- B. Furnish mill certificates for steel bar reinforcement, to the Project Engineer certifying that each shipment meets specifications. The fabricator will furnish certificates with bar lists to designate location of shipment and the time steel is delivered to the project.

1.03 QUALITY ASSURANCE

- A. Reinforcing bars shall conform to ASTM A 615 "Deformed Billet-Steel Bars for Concrete".
- B. Mesh reinforcement shall conform to ASTM A 185 "Welded Steel Wire Fabric for Concrete Reinforcement".
- C. Accessories shall conform to American Concrete Institute ACI 301 "Specifications for Structural Concrete for Buildings".
- D. Placement shall be in accordance with approved shop drawings and ACI 318 "Standard Building Code Requirements for Reinforced Concrete".
- E. Comply with ACI 315 "Manual of Standard Practice of Detailing Reinforced Concrete Structures".

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Reinforcing bar steel and mesh shall be handled, shipped and stored in a manner that will prevent distortion or other damage.
- B. Materials shall be stored in a manner to prevent excessive rusting and fouling with dirt, grease, or other bond-breaking coatings.

1.05 PROJECT CONDITIONS

- A. Examine the substrate over which concrete forms are installed and advise the Project Engineer of conditions detrimental to the installation of concrete formwork. Do not proceed until unsatisfactory conditions have been corrected.
- B. Coordinate placement of concrete reinforcing with installation of concrete formwork, vapor barriers, concrete inserts, conduit and all other items occurring in the area.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Steel Bar Reinforcement: Bar reinforcement shall conform to ASTM A 615, grade 60, of domestic manufacture. Bars shall be new; free from rust, scale, oil, or other coatings that will prevent bond.
- B. Welded Steel Wire Fabric: Fabric shall conform to ASTM A 185, new, free from rust and other coatings that will prevent bond.
- C. Accessories: Metal accessories as required shall support reinforcing bars and comply with ACI 315. Chairs and bolsters for use in exposed concrete shall have plastic coated or stainless steel legs or shall be plastic.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Fabricate and place reinforcement in accordance with the latest requirements of the American Concrete Institute and the approved shop drawings. Fabrication shall not proceed until MDOT Architect's approval is obtained.
- B. Reinforcing for one day's pour shall be completely placed and an inspection made by the Project Engineer / MDOT Architect prior to starting the pour.
- C. Concrete Protection for Reinforcement: Minimum coverage shall be as follows unless shown otherwise on drawings:
 - 1. Footings (bottom of steel) 3 inches clear
 - 2. Slabs 1-1/2 inches clear top and 3/4 inch clear bottom
 - 3. Beams 1-1/2 inch clear to stirrups
 - 4. Walls 2-1/2 inches clear
 - 5. Columns 2 inches clear to verticals

- D. Steel Dowels for successive work shall be wired in correct position before placing concrete. The "sticking" of dowels after placing concrete will not be permitted.
- E. Lap all bars 24 bar diameters at corners, splices and intersections.
- F. Interrupt Reinforcing steel at control joints in floor slabs.
- G. Do not weld reinforcing steel unless specifically approved by the Project Engineer.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, finishes, and other related items necessary to complete Project indicated by Contract Documents unless specifically excluded.
- B. Related Sections:
 - 1. Section 03 10 00 - Concrete Forming and Accessories.
 - 2. Section 03 20 00 - Concrete Reinforcing.

1.02 SUBMITTALS

- A. Submit concrete mix design, concrete compression test reports and product data and manufacturer's installation instructions for concrete curing compound.

1.03 TESTING LABORATORY SERVICES

- A. The Owner will provide testing as specified in Section 01 45 29.

1.04 QUALITY ASSURANCE

- A. Concrete work shall conform to all requirements of ACI 301, Specifications for Structural Concrete for Buildings and ACI 318 Building Code Requirements for Reinforced Concrete, latest editions, except as modified by supplemental requirements herein.
- B. Mix Design: Concrete mix design proportioning shall be by a certified MDOT Class III technician and submitted to the Project Engineer prior to placing concrete. Mix proportions shall meet the requirements of the 804.02.10 Section of the MDOT's Standard Specifications, 2004 Edition, except concrete requiring a trowel finish shall not be air entrained and shall meet the compressive strength requirements for Class B concrete. Concrete shall be sampled according to ASTM C 172 and compression test cylinders made and cured according to ASTM C 31. Control of mixes is to be maintained at the Ready-Mix Plant and on the job site. Adjustments of the mix proportions shall meet the requirements of Section 804.02.10.4 of MDOT's Standard Specifications, 2004 Edition.
- C. The Owner will mold and cure compression test cylinders (two cylinders per set) from concrete at the job site from the first placement of each mix design placed each day and additionally for each 100 cubic yards, or fraction thereof, of each mix design placed in a single day. In addition to sampling concrete in accordance with ASTM C 172, the Owner will follow the sampling requirements Paragraph 6.1.2 in the latest edition of the Department's *Concrete Field Manual*.
 - 1. Cylinders will be tested in accordance with ASTM C 39. The Owner will mold one set of cylinders for ensuring the concrete meets the minimum 28-day acceptance requirements.

2. The Owner will mold three sets of cylinders for form removal in accordance with Subsection 907-804.03.15. Forms may be removed when the compressive strength of the field cured cylinders reaches 2000 psi.
3. In addition to determining the slump, temperature, and total air content of the concrete used for molding the test cylinders, the Owner will determine the yield of each mix design during the first placement of each mix design.
4. Copies of all test reports shall be furnished to the ready mixed concrete producer and as directed by the Project Engineer.

1.05 COORDINATION

- A. Verify that all pipes under grade have been installed and tested before being covered. Check and verify materials and locations of inserts, anchors, and items required by other trades before pouring concrete. Concerned subcontractors shall be notified of date of pour in sufficient time to allow for completion of their work.
- B. The Contractor shall notify the Project Engineer upon completing formwork and all reinforcing steel for the next intended pour, and shall not commence pouring operation until all forms and reinforcing steel are approved by the Project Engineer.
- C. Project Engineer shall have free access to all materials used, and the required samples are to be furnished by the Contractor, as directed.
- D. Inspection and written approval from the floor-covering subcontractor is required for slab finish receiving floor covering.

PART 2 - PRODUCTS

2.01 CONCRETE, GENERAL

- A. All concrete, unless otherwise specifically approved in writing by the Project Engineer, shall be transit-mixed in accordance with ASTM C94. Control of concrete shall be under supervision of testing laboratory as described in Section 01 45 29.
- B. All concrete, unless noted otherwise, shall be Class B.
- C. Maximum slump for normal weight concrete shall be 4 inches. Slump may be increased to 8 inches with an approved water reducer.

2.02 CONCRETE MATERIALS

- A. Portland Cement: ASTM C-150, Type I.
- B. Water: From an approved source.
- C. Structural Concrete Aggregate: Coarse aggregate size number 57 or 67 shall be used and shall meet the requirements of MDOT Standard Specifications, 2004 Edition.
- D. Admixtures: Admixtures shall be from the MDOT Approved List. Non-uniform addition of mixtures that result in erratic setting of the concrete will cause rejection of the concrete with subsequent removal from the structure at the concrete producer's expense.

2.03 RELATED MATERIALS

- A. Preformed Expansion Joint Fillers: Provide pre-molded, asphalt impregnated board in widths and thickness required by conditions (1/2-inch minimum). Joint fillers shall conform to ASTM D994, D1751 or D1752.
- B. Curing Compound: Clear bond, manufactured by Guardian Chemical Co., Kure-N-Seal, manufactured by BASF / Sonneborn, Safe-Cure, manufactured by Dayton Superior Corp. or approved equal. Compound shall not interfere with bonding or floor finish.
- C. Non-Shrink Grout: Shall be one part Portland cement to 2-1/2 parts of fine aggregate or Cement grout ASTM C 387 Dry Package mixtures similar and equal to Masterflow 713 Plus, manufactured by BASF / Master Builders; Five Star Grout, U.S. Grout Company or approved equal.

2.04 CONCRETE MIXES

- A. Ready-Mixed Concrete: Ready-mix concrete shall be mixed and delivered in accordance with requirements of ASTM C 94. Uniformly and accurately control proportions of material weight. Slump tolerances given in ASTM C 94 apply. Calcium chloride shall not be used.
- B. Failure of concrete to meet the specified requirements may result in rejection with subsequent removal and replacement or re-testing (including coring, load test, etc.) at the supplier's expense.
 - 1. Concrete exhibiting adverse reaction as a result of the presence of deleterious substances shall be removed and replaced or repaired in a manner completely satisfactory to the Project Engineer.
 - 2. All cost of such corrective action, including all necessary testing, shall be borne by the concrete producer.
- C. The Contractor may request adjustment to concrete mix design when characteristics of materials, job conditions, weather, test results, or circumstances warrant, at no additional cost to the Owner and as approved by the Project Engineer. Laboratory test data for revised mix designs and strength results must be submitted to and approved before using in the Work.

PART 3 - EXECUTION

3.01 CONCRETE PLACEMENT

- A. Concrete shall be placed so as to avoid segregation of materials and to prevent cold joints by avoiding re-handling, by keeping pours generally level, and by adequate vibration. Placing is not to be started during rain or snow, and if placing is underway when such conditions occur, continue operations only long enough to provide a suitable construction joint.
- B. During hot weather or periods of low humidity combined with a definite breeze, rapid loss of moisture shall be discouraged by thorough wetting of forms and by using a fine fog spray when finishing. At these times particular attention shall be given to providing an adequate number of finishers to expedite this operation. During cold weather fresh concrete shall be protected from freezing.

- C. Prior to placing, forms shall be cleaned free of foreign material and shall be washed down with water. Placing shall be a continuous operation between planned construction joints with fresh cement mixed only with plastic concrete already in place. Avoid cold joints.
- D. Vibration shall be thorough, using vibrators small enough to work within reinforcing. The vibrator shall be inserted at many points about 24 inches apart. Avoid over-vibration and transporting concrete in form by vibration. A spare vibrator, which will operate, shall be kept on the job during all placing operations.

3.02 CONSTRUCTION JOINTS

- A. Locate construction joints and provide shear keys as directed by the Project Engineer / MDOT Architect. Allow concrete to set for 24 hours before an adjoining pour is started. Slabs across the joint shall be level and the surface shall be level and shall not be feathered. Before proceeding with the following pour at a joint, thoroughly clean the joint, remove all loose material, and brush in a thick cement slurry.

3.03 CURING

- A. Keep all concrete moist for 5 days after placing by covering with concrete curing paper, by leaving forms in place or by using curing compound. All combined with regular wetting as necessary.

3.04 PATCHING

- A. Honeycombed and defective concrete shall be removed and replaced, or repaired, as directed by the Project Engineer. Form tie holes and minor areas, as determined by the Project Engineer, shall be repaired as follows:
 - 1. Completed patch shall be indistinguishable from surrounding surfaces in color and texture.
 - 2. Patching mixture, using same cement sand as used in concrete shall consist of 1 part cement to 2-parts sand, with just enough mixing water to permit placing. Premix mixture, allow standing at least 30 minutes before using, stirring with trowel during this period.
 - 3. Remove material to sound concrete, dampen surface and brush thick 1 to 1 cement sand bond coat into surface.
 - 4. When bond coat begins to lose water sheen, thoroughly pack patching mixture in place, leaving it somewhat higher than adjacent surface. Embed pieces of gravel by hand into patch.

3.05 FINISHES FOR FLATWORK

- A. Trowel finish floor surfaces scheduled as concrete finish walking surfaces, or floor surfaces scheduled to receive floor covering. Trowel finished surfaces shall be true planes within 1/8 inch in 10 feet as determined by a 10 foot straightedge placed anywhere on the slab in any direction.
- B. Smooth trowel finish after the surface is screeded and floated. Start troweling when all water has disappeared from the surface to first level the surface, then start final troweling when concrete has set where it no longer shows indentation from finger pressure. Trowel to a hard, smooth surface free of marks. Dusting of cement or cement and sand will not be permitted.

- C. Interior floors, with concrete finish scheduled, shall receive an application of hardener compound applied according to manufacturer's published instructions. Concrete surfaces to receive ceramic floor tile or brick shall receive float finish.
- D. Exterior walks and ramps shall have smooth trowel and fine broom finish.

3.06 FINISHES FOR GRADE BEAMS

- A. Exposed grade beam faces shall have a smooth form finish obtained by using selected form facing plywood, arranged orderly and symmetrically with a minimum of seams.
 - 1. Repair and patch defective areas with all fins or other projections completely removed and smoothed. Provide grout cleaned finish consisting of 1 part Portland Cement to 1-1/2 parts fine sand by column, and mix with water to the consistency of thick paint.
 - 2. Blend standard Portland cement and white Portland cement, amounts determined by trial patches, so that the final color of dry grout will closely match adjacent concrete surfaces.
- B. Thoroughly wet concrete surfaces and apply grout immediately to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

END OF SECTION

SECTION 04 01 25

UNIT MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: The extent of masonry restoration, dampproofing, and cleaning required is shown on the drawings and as specified. The work of this section includes the following.

1. Replace deteriorated brick at locations where lintels are being replaced.

B. Related Sections:

1. Section 04 20 00 - Unit Masonry.
2. Section 07 92 00 - Joint sealants.

1.02 QUALITY ASSURANCE

A. Work shall be performed by a masonry contractor with not less than 5 years successful experience in masonry projects similar in size and scope to the work of this project. The contractor shall employ personnel skilled in the processes and operations indicated. The restoration contractor shall be licensed by the State of Mississippi as a masonry contractor.

B. Obtain materials for masonry restoration from a single source for each type material required (cement, sand, etc.) to ensure match of quality, color, pattern, and texture to the existing building.

1.03 ACTION SUBMITTALS

A. Product Data: Submit manufacturer's technical data (not material safety data sheets) for each product indicated including recommendations for their application and use. Include reports and certifications substantiating that products comply with requirements.

B. Sample Warranty: Submit restoration contractor's and manufacturer's sample warranties prior to application for MDOT Architect's approval.

C. Qualifications: Submit restoration contractor's qualifications including list of completed projects.

D. Program: Submit written for each phase of restoration process including protection of surrounding materials on building and site during operations.

E. Samples: Submit samples of the following prior to erection of mock-up:

1. Mortar for pointing and masonry rebuilding and repair, in form of 6 inch long by 1/2 inch wide sample strips of mortar set in aluminum or plastic channels or on-site samples.
2. Chemical cleaning material.
3. Sealants.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to site in manufacturer's original and unopened containers and packaging, bearing labels indicating type and names of products and manufacturers.
- B. Protect masonry restoration materials during storage and construction from wetting by rain, snow, or ground water, and from staining or intermixture with earth or other types of materials.

1.05 PROJECT CONDITIONS

- A. Clean masonry surfaces only when air temperatures are 40 degrees F (4 deg. C) and above and will remain so until masonry has dried out, but for not less than 7 days after completion of cleaning.
- B. Do not repoint mortar joints or repair masonry unless air temperatures are between 40 degrees F (4 degrees C) and 80 degrees F (27 degrees C) and will remain so for at least 48 hours after completion of work.
- C. Prevent grout or mortar used in repointing and repair work from staining face of surrounding masonry and other surfaces. Remove immediately grout and mortar in contact with exposed masonry and other surfaces.
- D. Protect sills, ledges and projections from mortar droppings.

1.06 SEQUENCING / SCHEDULING

- A. Perform masonry restoration work in areas of lintel repair in the following sequence or as required by product manufacturers:
 - 1. Rake out mortar from brick masonry.
 - 2. Remove masonry as required for lintel replacement.
 - 3. Dampproofing of exposed CMU backup.
 - 4. Install lintel and flashing.
 - 5. Replace deteriorated brick. Existing brick that is sound and whole may be reused.
 - 6. Clean and/or repair adjacent finishes damaged or soiled during the progress of the work.

1.07 WARRANTIES

- A. Masonry restoration work shall be guaranteed for a period of 5 years. The guarantee period shall begin upon issuance of notice of completion. This shall be a notarized guarantee from the Restoration Company performing this work stating that their work will be guaranteed for this period. This guarantee is to include labor and material with no cost to the Owner.

PART 2 - PRODUCTS

2.01 MASONRY MATERIALS

- A. Portland Cement: ASTM C 150, Type 1
- B. Hydrated Lime: ASTM C 207, Type S

- C. Aggregate for Mortar: ASTM C 144. Match size, texture and gradation of existing mortar as closely as possible.
- D. Colored Mortar Pigment: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes to match existing mortar. Use only pigments with record of satisfactory performance in masonry mortars which are clean, free of oils, acids, alkalis and organic matter.

2.02 CLEANING MATERIALS AND EQUIPMENT

- A. Water for Cleaning: Clean, potable, free of oils, acids, alkalis, salts, and organic matter.
- B. Brushes: Fiber bristle only.
- C. Acid Cleaner: Manufacturer's standard strength acidic masonry restoration cleaner composed of hydrofluoric acid blended with other acids including trace of phosphoric acid and combined with special wetting systems and inhibitors. Equal to Sure Klean Restoration Cleaner by ProSoCo, Inc.
- D. Spray Equipment: Provide equipment for controlled spray application of water and chemical cleaners, if any, at rates indicated for pressure, measured at spray tip, and for volume.
- E. Spray application of chemical cleaners: Provide low-pressure tank or chemical pump suitable for chemical cleaner indicated, equipped with cone-shaped spray-tip.
- F. Spray application of water: Provide fan-shaped spray-tip which disperses water at an angle of not less than 15 degrees.
- G. Cleaning Materials: Unless otherwise indicated, dilute chemical cleaning materials with water to produce solutions of concentration indicated but not greater than that recommended by chemical cleaner manufacturer.

2.03 MORTAR MIXES

- A. Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical batch mixer.
- B. Mix pointing mortar in strict accordance with manufacturer's written instructions.
- C. Where colored mortar pigments are indicated do not exceed pigment-to-cement ration of 1 to 10, by weight.
- D. Do not use admixtures of any kind in mortar, unless otherwise indicated.
- E. Mortar Proportions:
 - 1. Comply with ASTM C 270, Proportion Specification, Type N, unless otherwise indicated with cementitious material content limited to portland cement-lime.
 - 2. Add colored mortar pigment to produce mortar colors required.

2.04 DAMPPROOFING

- A. Provide cold applied, asphalt emulsion bituminous dampproofing on outside face of exterior back-up masonry material where exposed by brick work for lintel replacement.

- B. Dampproofing shall be Hydrocide 700B by BASF Building Systems or equal.

2.05 FLEXIBLE MEMBRANE WALL FLASHING

- A. 0.8 mm (32 mils) of self-adhesive rubberized asphalt integrally bonded to 0.2 mm (8 mil) of cross-laminated, high-density polyethylene film to provide a min. 1.0 mm (40 mil) thick membrane. Membrane shall be interleaved with disposable silicone-coated release paper until installed.
- B. Equal to Perm-A-Barrier Wall Flashing manufactured by Grace Construction Products.

2.06 SEALANT MATERIALS

- A. Bond Breaker Tape: Equal to that manufactured by Trimco.
- B. Sealant: 1 part urethane equal to Sonolastic NP 1 manufactured by Rexnord Chemical Products, Inc., a Sonneborn building product. Color to match mortar.
- C. Backer Rod: Equal to Sonofoam Backer Rod by Sonneborne.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect persons, motor vehicles, surrounding surfaces of building whose masonry surfaces are being restored, building site, and surrounding buildings from injury resulting from masonry restoration work.
- B. Prevent cleaning solution from coming into contact with pedestrians, motor vehicles, landscaping, buildings and other surfaces which could be injured by such contact.
- C. Protect glass, unpainted metal trim and polished stone from contact with acidic chemical cleaners by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape. Apply masking agent to comply with manufacturer's recommendations. Do not apply liquid masking agent to painted or porous surfaces.
- D. Protection can be eliminated subject to Project Engineer's approval, if testing demonstrates no detrimental effect from exposure to cleaning solutions.

3.02 DAMPPROOFING

- A. Apply the dampproofing material with either brush or spray equipment in accordance with the rates and methods recommended by the manufacturer for designated application, to achieve not less than a dry film thickness of 15 mils (0.4 mm). Apply in two coats if necessary to obtain required thickness, allowing adequate drying time between coats. All surfaces shall be completely covered and areas around penetrations, corners and similar areas shall be double coated.

3.03 CLEANING

- A. Proceed with cleaning in an orderly manner. Work from top to bottom. Use only those cleaning methods indicated for each masonry material and location. Perform each cleaning method indicated in a manner which results in uniform coverage of all surfaces and which produces an even effect without streaking or damage to masonry surfaces. Rinse off chemical residue and soil by working upwards from bottom to top of each treated area at each stage or scaffold setting.
- B. Water Application Methods:
 - 1. Spray Applications: Spray-apply water to masonry surfaces to comply with requirements indicated for location, purpose, water temperature, pressure, volume and equipment.
 - 2. Unless otherwise indicated, hold spray nozzle not less than 6 inches from surface of masonry and apply water from side to side in overlapping bands to produce uniform coverage and an even effect.
 - 3. Low Pressure Spray: 100-400 psi, 3-6 gallons per minute.
- C. Chemical Cleaner Application Methods: Apply chemical cleaners to masonry surfaces to comply with chemical manufacturer's recommendations using brush or spray application methods, at Contractor's option, unless otherwise indicated. Do not allow chemicals to remain on surface for periods longer than that indicated or recommended by manufacturer.

3.04 MORTAR REMOVAL

- A. Remove mortar from brick masonry within raked-out joints to provide reveals with square backs and to expose masonry for contact with pointing mortar or caulk. Brush, vacuum or flush joints to remove dirt and loose debris.
- B. Do not spall edges of brick masonry or widen joints. Repair any units which become damaged.
- C. Cut out old mortar by hand with chisel and mallet, unless otherwise indicated. No power tools will be allowed.

3.05 REPLACING DETERIORATED BRICK

- A. Preparatory Work: Remove bricks as required for replacement of lintels as indicated in contract documents.
 - 1. Whole and sound existing brick removed for lintel work shall be reused.
 - 2. Replacement of deteriorated brick shall be as specified in Section 04 20 00, Unit Masonry.

END OF SECTION

SECTION 04 20 00 UNIT MASONRY

PART 1-GENERAL

1.01 SECTION INCLUDES

- A. Brick veneer masonry work as shown on the Drawings and schedules.

1.02 RELATED SECTIONS

- A. Section 04 01 25 - Unit Masonry Restoration and Cleaning.

1.03 SUBMITTALS

- A. Submit product data, specifications and other data for each type of masonry unit and accessory required, including certification that each type complies with the specified requirement. Include instructions for handling, storage, installation, cleaning and protection of each. Indicate by transmittal that the Installer has received a copy of each instruction.

1.04 QUALITY ASSURANCE

- A. Fire-rated Masonry: Wherever a fire-resistance classification is shown or scheduled for unit masonry construction (4 hour, 3 hour, and similar designations), comply with the requirements for materials and installation established by the American Insurance Association and other governing authorities for the construction shown.

1.05 PROJECT CONDITIONS

- A. Protect partially completed masonry against weather, when Work is not in progress, by covering top of walls with strong, waterproof, non-staining membrane. Extend membrane a minimum of 2 inches down both sides of walls and anchor securely in place.
- B. Protect masonry against freezing when the temperature of the surrounding air is 40 degrees F. and falling. Heat materials and provide temporary protection of completed portions of masonry work. Comply with the requirements of the governing code and with the "Construction and Protection Recommendations for Cold Weather Masonry Construction" of the Technical Notes on Brick and Tile Construction by the Brick Institute of America (BIA).

PART 2-PRODUCTS

2.01 ACCEPTABLE BRICK MANUFACTURERS

- A. Equivalent products by the following manufacturers are acceptable subject to compliance with specifications:
 - 1. Boral Brick, Hattiesburg, Mississippi
 - 2. Cherokee Brick & Tile Company, Jackson, Mississippi
 - 3. Columbus Brick, Columbus, Mississippi
 - 4. Old South Brick & Supply Company, Jackson, Mississippi

- B. Substitutions shall fully comply with specified requirements in Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 MASONRY UNITS

- A. Obtain masonry units from one manufacturer, of uniform texture and color for each kind required, for each continuous area and visually related areas.

2.02 BRICK, GENERAL

- A. Provide size, type, color, and pattern of brick to match existing for exposed vertical brickwork. At Contractor's option, provide solid or cored brick for vertical brickwork. Do not use cored brick with net cross-sectional area less than 75 percent of gross area in the same plane or with core holes closer than 3/4 inch from any edge. Provide solid units where indicated and where the cores in cored bricks are exposed to view.
- B. Face Brick: Brick exposed to view, ASTM C 216, Grade SW for exterior exposures.
- C. Building (Common) Brick: Brick not exposed to view, ASTM C 62, Grade SW for exterior exposures and Grade MW for interior masonry which will be concealed by other work. Select from manufacturer's standard colors and textures.

2.03 MORTAR MATERIALS

- A. Mortar mixes shall comply with the requirements of ASTM C 270 Standard Specification for Mortar for Unit Masonry. Type S mortar shall be used for exterior Work. Type N mortar shall be used for interior Work. Mortar color for face brick shall match existing.
- B. Portland Cement: ASTM C 150 Type I, except Type III may be used for cold weather protection.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Sand: ASTM C 144, except for joints less than 1/4 inches, use aggregate graded with 70 to 100 percent passing the No. 16 sieve.

2.04 MASONRY ACCESSORIES

- A. Provide adjustable wire ties conforming to ASTM A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement. The wire shall be a minimum of W1.7, 9 gage. Plate portions of adjustable ties shall be a minimum of 14 gage in thickness. Plate portion shall conform to ASTM A 366 Standard Specification for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality. All tie components shall be hot-dip galvanized after fabrication and shall conform to ASTM A 153 Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware, Class B-2.
- B. Anchoring Devices for Masonry: Provide straps, bars, bolts and rods fabricated from not less than 16 gage sheet metal or 3/8 inch diameter rod stock, unless otherwise indicated.
- D. Flashing for Brick Veneer Walls: Provide concealed flashing, shown to be built into masonry, as specified in Section 07 27 26 Fluid Applied Membrane and Air Barriers.

2.05 MASONRY MAT & WEEP VENTS

- A. Manufacturer and Type: Products equal to CavClear Masonry Mat and CavClear Weep Vents as manufactured by Archovations, Inc., PO Box 241, Hudson, WI 54016. Telephone (888) 436-2620.
1. Description: Airspace maintenance and drainage system for masonry cavities to prevent mortar from making contact with the backup to ensure water management. The system shall be fluid conducting, non-absorbent, mold and mildew resistant polymer mesh consisting of 100 percent recycled polymer with PVC binder. Weep Vents shall have "M" notched bottom. Color to be selected by the Project Architect from full range of standard colors
 2. Mat Size: 1-1/4 inch thick by 16 inches high by 8 feet long.
 3. Weep Vent Size: 1/2 inch thick by 2-1/2 inches high by 3-1/2 inches wide.
- B. Equivalent products by the following manufacturers are acceptable:
1. Advanced Building Products, Inc., P.O. Box 98, Springvale, ME 04083. Tel: (800) 252-2306.
 2. Colbond Geosynthetics, P.O. Box 1057, Sand Hill Road, Enka, NC 28728. Tel. (800) 664-6638.
- C. Substitutions shall fully comply with specified requirements and Section 01 62 14-Product Options and Substitution Procedures.

PART 3-EXECUTION

3.01 INSPECTION

- A. Masonry installer must examine the areas and conditions under which masonry is to be installed and notify the Project Engineer and the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to masonry installer.

3.02 INSTALLATION

- A. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown or specified.
- B. Cut brick with motor-driving saw designed to cut masonry with clean, sharp, un-chipped edges. Cut units as required to provide pattern shown and to fit adjoining Work neatly. Use full units without cutting wherever possible.
- C. Wet brick having ASTM C67 absorption rates greater than 0.025 oz. per sq. inch per minute. Determine absorption by drawing a circle the size of a quarter on typical units and place 20 drops of water inside the circle. Wet brick units only if water is absorbed within 1-1/2 minutes. The units shall be wetted thoroughly 3 to 24 hours prior to their use so as to allow moisture to become distributed throughout the unit. The units shall be surface dry when laid.

- D. Frozen Materials and Work: Do not use frozen materials or materials mixed or coated with ice or frost. For masonry, which is specified to be wetted, comply with the BIA recommendations. Do not use calcium chloride in mortar or grout.
- E. Pattern Bond: Lay masonry work in a bond pattern to match existing.
- F. Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to properly locate openings, movement type joints, returns and offsets. Avoid the use of less-than half-size units at corner, jambs and wherever possible at other locations unless otherwise indicated at cut brick locations behind downspouts. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work.
- G. Stopping and Resuming Work: Rack back 1/2 masonry unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if specified to be wetted), and remove loose masonry units and mortar prior to laying fresh masonry.

3.03 MORTAR BEDDING AND JOINTING

- A. Mix mortar ingredients for a minimum of 5 minutes in a mechanical batch mixer. Use water clear and free of deleterious materials, which would impair the work. Do not use mortar, which has begun to set, or if more than 2-1/2 hours has elapsed since initial mixing. Re-temper mortar during 2-1/2 hour period as required restoring workability.
- B. Lay brick and other solid masonry units with completely FILLED bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. DO NOT slush head joints.
- C. Joints: Maintain joints widths to match existing, except for minor variations required to maintain bond alignment. Cut joints flush for masonry walls that are to be concealed or to be covered by other materials. Tool exposed joints to match existing. Rake out mortar in preparation for application of caulking or sealant where shown.
- D. Remove masonry units disturbed after laying; clean and relay in fresh mortar. Do not pound corners at jambs to fit stretcher units that have been set in position. If adjustments are required, remove units, clean off mortar, and reset in fresh mortar.

3.04 EXTERIOR BRICK VENEER WALLS

- A. Keep cavity clean of mortar droppings during construction. Strike joints facing cavity, flush.
- B. Tie exterior wythe to back-up with adjustable ties embedded in mortar joints at proper spacing, not more than 16 inches on center vertically and 24 inches on center horizontally. Fasten ties to wood frame with corrosion-resistant nails that penetrate the sheathing and are driven a minimum of 1-1/2 inches into the studs.
- C. Place Masonry Mat continuously full height in exterior masonry cavity prior to construction of exterior wythe; follow manufacturer's installation instructions. Install horizontally between wall ties or joint reinforcement. Stagger end joints in adjacent rows. Butt adjacent pieces to moderate contact. Fit to perimeter construction and penetrations without voids. Use multiple layers at bottom of wall and above through-wall flashings when air space depth exceeds masonry mat thickness by more than 3/8 inch. Extend extra mat at least to top of base flashing.

- D. Place Weep Vents in head joints at exterior wythe of cavity wall located immediately above lintels and flashing, spaced 24 inches on center, unless otherwise shown. Install with notched side down. Leave the side of the masonry units forming the vent space un-buttered and clear from mortar. Slide vent material into joint once the two masonry units forming the weep vent are in place. Install the Weep Vents as the wall is being erected so joints do not become filled with mortar or debris.

3.05 ANCHORING MASONRY WORK

- A. Provide anchoring devices of the type shown and as specified. If not shown or specified, provide standard type for facing and back-up involved. Anchor masonry to structural members where masonry abuts or faces such members to comply with the following:
- B. Provide an open space not less than 1/2 inch in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials. Anchor masonry to structural members with metal ties embedded in masonry joints and attached to structure. Provide anchors with flexible tie sections unless otherwise shown. Space anchors as shown, but not more than 24 inches on center horizontally.

3.06 LINTELS

- A. Install loose lintels of steel and other materials where shown and as needed.

3.07 CONTROL AND EXPANSION JOINTS

- A. Provide vertical expansion, control and isolation joints in masonry where existing in areas of masonry work. Build-in related masonry accessory items as the masonry work progresses. Rake out mortar in preparation for application of caulking and sealants.

3.08 FLASHING OF MASONRY WORK

- A. Provide concealed flashing in masonry work as shown. Prepare masonry surfaces smooth and free from projections, which might puncture flashing. Place through-wall flashing on bed of mortar and cover with mortar. Seal flashing penetrations with mastic before covering with mortar. Terminate flashing 1/2 inch from face of wall, unless otherwise shown. Extend flashing beyond edge of lintels and sills at least 4 inches and turn up edge on sides to form pan to direct moisture to exterior. Provide weep holes in the head joints of the first course of masonry immediately above concealed flashing, spaced 24 inches on center, unless otherwise shown.
- A. Install reglets and nailers for flashing and other related Work where shown to be built into masonry Work.

3.09 SETTING TOLERANCES

- A. Variation from Plumb: Do not exceed 1/8 inch in 5 feet, nor 1/4 inch in 20 feet maximum.
- B. Variation from Level: Do not exceed 1/8 in 5 feet nor 1/4 inch in 20 feet maximum.
- C. Variation in joint width: Do not vary joint width more than 1/8 inch or 1/4 of nominal joint width, which ever is greater.

- D. Variation in Plane Between Adjacent Surfaces: Do not exceed 1/8 inch difference between planes of adjacent components or adjacent surfaces indicated to be flush with components.

3.10 REPAIR, POINTING AND CLEANING

- A. Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged or if units do not match adjoining units as intended. Provide new units to match units and install with fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point up all joints at corners, openings and adjacent work to provide a neat uniform appearance, properly prepared for application of caulking or sealant compounds.
- C. Good workmanship and job housekeeping practices shall be used to minimize the need for cleaning the masonry. Clean exposed brick masonry surfaces as recommended by BIA Technical Notes 20 "Cleaning Clay Products Masonry" and masonry manufacturer. Clean exposed masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings. Protect the base of the wall from mud splashes and mortar droppings. Should additional cleaning be required apply chemical (muriatic acid is NOT acceptable) or detergent cleaning solutions in accordance with the masonry and chemical manufacturers' recommendations.

END OF SECTION

SECTION 05 50 00 METAL FABRICATIONS

PART 1-GENERAL

1.01 SECTION INCLUDES

- A. All miscellaneous metal work. The Work includes, but is not limited to steel lintels and miscellaneous framing & supports.

1.02 RELATED SECTIONS

- A. Section 09 05 15 – Color Design.
- B. Section 09 90 00 - Painting and Coating: Painting for all ferrous metal exposed to view.

1.03 SUBMITTALS

- A. Submit shop drawings for shop fabricated items. Indicate profiles, sizes, materials connection details, attachments, reinforcing, anchorage, size and type of fasteners, and accessories. All dimensions shall be shown, including every hole location, fastening, bearing member and the like. Include erection drawings, with plans, elevations, and details.

PART 2-PRODUCTS

2.01 MATERIALS

- A. Structural shapes shall be standard sections conforming to the American Society for Testing Materials Specification A-36. Punch and drill as necessary for work of others. Provide all bearing plates and all anchors, bolts, and etc. The Work shall be true and free of twists, bends and open joints between component parts. Materials shall be thoroughly straightened in the shop before laid off or worked in any way, care being used to avoid injury to the material. All items shall be galvanized or primed on all surfaces prior to installation.
- B. Gray cast iron shall conform to ASTM A48-83, class 30. All castings shall be of uniform quality, free from blowholes, shrinkage defects, swells, cracks, honeycomb or other defects. Castings shall be free of fins, burrs and slag.
- C. Expansion bolts shall be equal to Phillips Red Head or "cinch" bolts as manufactured by the National Lead Company. Hilti Fasteners, Rawlplug Company and Wej-it Corporation are acceptable manufacturers. Use toggle type bolts or similar for all anchorage into hollow construction.
- D. Bolt or weld connections: Provide necessary lugs and brackets for anchorage. Welding shall be in accordance with current "Code of Fusion, Welding and Gas Cutting in Building Construction, Part A - Structural Steel" issued by the American Welding Society, both for fabrication and erection. All welders shall have certification, as a result of tests prescribed by the American Welding Society.
- E. Detail metal Work for ample size, strength and stiffness and as indicated. Countersink and provide reinforcement where necessary; drill or punch holes for bolts and screws. At the proper time furnish the necessary templates, patterns and items of miscellaneous metal, such as sleeves, inserts and similar items to be built into adjoining Work.

- F. Fabricate metal Work with sharp lines and angles, with smooth true surfaces and clean edges. Form exposed joints to exclude water. Furnish certificates from manufacturers stating that materials comply with the specification requirements.
- G. Provide as necessary holes of proper number and spacing for the attachment of Work of other trades. Do not use cutting torch in field without permission of the Project Engineer.
- H. Anchor bolts, washers, nuts and clamps shall be furnished where indicated on the Drawings and where necessary for properly securing Work in place. All bolts and anchors used on the exterior of the building or built into exterior walls shall be cadmium plated. Miscellaneous angles and plates not indicated or specified otherwise shall not be less than 1/4 inch thick.
- I. Shop paint and field touch up shall be ICI Devflex 4020, Rustoleum 769, Tnemec 99, Southern Coatings 476, or approved equal. Shop coat shall be compatible with finish coats specified in Section 09900 – Paints and Coatings.
- J. Fastenings shall be invisible where possible. Where exposed, screws, bolts, and the like shall be vandal-proof. All welded exposed joints on steel manufactured items; etc. shall be ground smooth and filled to receive paint.

2.02 METAL PRIMER

- A. Where materials come in contact with dissimilar materials which may cause harmful reaction, where exposed to moisture, or such as aluminum to cement mortar or concrete, the surface shall be protected by zinc chromate primer or approved paint.

2.04 LOOSE LINTELS

- A. Provide loose galvanized steel lintels for openings and recesses in masonry walls and partitions. Weld adjoining members together to form a single unit where indicated. Provide a minimum of 8 inches bearing at each side of openings.

PART 3-EXECUTION

3.01 INSTALLATION

- A. Perform cutting, drilling and fitting required for installation; set Work accurately in location, alignment and elevation measured from established lines and levels. Provide anchorage devices and fasteners where necessary for installation to other Work.
- A. Set loose items on cleaned bearing surfaces, using wedges or other adjustments as required. Solidly pack open spaces with bedding mortar, consisting of 2 part Portland Cement to 3 parts sand and only enough water for packing and hydration, or use commercial non-shrink grout material.
- B. Touch-up shop paint after installation. After cleaning field welds, bolted connections and abraded areas, apply same type paint as used in shop. Color to be selected from standard colors available. Use galvanizing repair paint on damaged galvanized surfaces.

END OF SECTION

SECTION 06 10 00 ROUGH CARPENTRY

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Concealed wood grounds and blocking to frame openings, form terminations, to provide anchorage and / or support of other interior and exterior locations; plywood and rough hardware.

1.02 COORDINATION

- A. Fit carpentry Work to other Work; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds and similar supports to allow proper attachment of other Work.

1.03 QUALITY CONTROL

- A. Factory mark each piece of lumber and plywood to identify the type, grade, agency providing the inspection service, the producing mill and other qualities as specified.

1.04 DELIVERY, STORAGE AND PROTECTION

- A. Keep materials dry during delivery and storage. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber and plywood, and provide air circulation within stacks. Protect installed carpentry work from damage by work of other trades until Owner's acceptance of the Work. Contractor shall comply with manufacturer's required protection procedures.

1.05 PROJECT CONDITIONS

- A. Installer must examine all parts of the supporting structure and the conditions under which the carpentry Work is to be installed, and notify the Contractor in writing of any conditions detrimental to the proper and timely completion of the Work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

PART 2 - PRODUCTS

2.01 LUMBER

- A. For each use, comply with the "American Softwood Lumber Standard" PS 20 by the U.S. Department of Commerce. Nominal sizes are shown or specified; provide actual sizes complying with the minimum size requirements of PS20 for the moisture content specified for each use. Provide dressed lumber, S4S, unless otherwise shown or specified. Provide seasoned lumber with 19 percent maximum moisture content at time of dressing and complying with dry size requirements of PS 20, unless otherwise specified.

2.03 BOARDS

- A. Where lumber less than 2 inches in nominal thickness and 2 inches or more in nominal width is shown or specified, provide boards complying with dry size requirements of PS 20.
- B. Concealed Boards: Where boards will be concealed by other work, provide the following:
 - 1. Moisture Content: 19 percent maximum, mark boards "S- Dry".
 - 2. Species and Grade: Provide one of the following:
 - a. Southern Pine (SPIB) No. 2 boards.
 - b. WCLB (any species) No. 3 boards.

2.04 PLYWOOD

- A. For each use, comply with the requirements for "Softwood Plywood/Construction and Industrial" PS 1 by the U.S. Department of Commerce.
- B. Concealed Plywood: Where plywood will be concealed by other work, provide 5/8-inch minimum thickness Interior Type plywood C-D Plugged Grade, unless otherwise specified or shown on Drawings. For backing panels for electrical or telephone equipment, provide 3/4 inch thick fire-retardant treated Standard grade plywood with exterior glue.
- C. Exposed Plywood: Where plywood will be exposed to view, provide 5/8 inch minimum thickness Interior Type plywood B-C Plugged Grade, unless otherwise specified or shown on Drawings. For backing panels for electrical or telephone equipment, provide 3/4 inch thick fire-retardant treated Standard grade plywood with exterior glue. All exposed plywood shall be painted per the room finish schedule.
- D. Exterior Plywood: Exterior type, medium density, C Grade for concealed faces.

2.05 ANCHORAGE AND FASTENING MATERIALS

- A. For each use, select proper type, size, material, and finish complying with the applicable Federal Specifications. Zinc electroplated steel fasteners for high humidity and treated wood locations. All nails shall be coated.

2.06 TREATED WOOD

- A. Complete fabrication of treated items prior to treatment, wherever possible. If cut after treatment, coat cut surfaces with heavy brush coat of same fire-retardant chemical used for treatment. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.
- B. Preservative Treatment: Where lumber or plywood is indicated as "Treated", or is specified herein to be treated, comply with the applicable requirements of the American Wood Preservers Institute (AWPI). Mark each treated item to comply with the AWP Quality Mark requirements for the specified requirements.
 - 1. Pressure-treat aboveground items with water-borne preservatives complying with AWPI P-2. After treatment, kiln-dry to maximum moisture content of 15 percent. Treat indicated items and the following:
 - a. Wood cants, nailers, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.

- b. Wood sills, sleepers, blocking, furring stripping and similar concealed members in contact with masonry or concrete.
- C. Fire-Retardant Treatment: Where "PR-S" lumber or plywood is shown or scheduled, comply with the AWPI Specification C-208 for pressure impregnation with fire-retardant chemicals to achieve a flame-spread rating of not more than 25 when tested in accordance with UL Test 723, ASTM E A4, or NFPA Test 355. Where treated items are indicated to receive a transparent or paint finish, use a fire-retardant treatment that will not bleed through or adversely affect bond of finish.
 - 1. All interior wood used for blocking or shims in walls shall be Fire-Retardant treated.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Use only sound, thoroughly seasoned materials of the longest practical lengths and sizes to minimize jointing. Use materials free from warp that cannot be easily corrected by anchoring and attachment. Sort out and discard warped material and material with other defects that would impair the quality of the Work.
- B. Securely attach carpentry work to substrates by anchoring and fastening as shown and as required by recognized standards. Countersink nail heads on exposed carpentry work and fill holes.
- C. Set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

3.02 ATTACHMENT AND ANCHORAGE

- A. Use common wire nails, except as otherwise shown or specified. Use finishing nails for finish Work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood; pre-drill as required.

3.03 WOOD GROUND NAILERS, BLOCKING, SLEEPERS AND FURRING

- A. Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Set true to line and level, plumb with intersections true to required angle. Coordinate location with other Work involved. Provide all blocking as required by manufacturer's requirements of other work.
- B. Attach to substrates securely with anchor bolts and other attachment devices as shown as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise shown. Building into masonry; anchor to formwork before concrete placement.
- C. Provide grounds of dressed, preservative treated, key-beveled lumber not less than 1-1/2 inch wide and of the thickness required to bring face of ground to exact thickness of finish material involved. Remove temporary grounds when no longer required.
- D. Wood Furring: Install plumb and level with closure strips at all edges and openings. Shim with wood as required.

END OF SECTION

SECTION 06 40 00

ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Architectural woodwork as shown on the Drawings. Architectural woodwork is defined to include (in addition to items so designated on the Drawings) miscellaneous exposed wood members commonly known as "Finish Carpentry" or "Millwork", except where specified under another Section of these Specifications
- B. The types of architectural woodwork include, but are not limited to:
 - 1. Standing and Running Trim.
 - 2. Solid surface sills.
- C. Related Sections:
 - 1. Section 06 10 00 – Rough Carpentry.
 - 2. Section 09 05 15 – Color Design.
 - 3. Section 09 90 00 – Painting and Coating

1.02 DEFINITIONS

- A. Terms used in this Section are in accordance with terminology of the Architectural Woodwork Institute, Architectural Woodwork Quality Standards, Eighth Edition, Version 1.0, 2003

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product and accessories with installation instructions 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.
- C. Samples:
 - 1. Full set of solid surface samples to select color from. Once color is selected, submit two additional samples of selected color.

1.04 QUALITY ASSURANCE

- A. Unless otherwise shown or specified, comply with specified provisions of the Architectural Woodwork Institute (AWI) and approved "Quality Standards".
 - B. Quality Marking: Mark each unit of architectural woodwork with mill's or fabricator's identification and grade marks, located on surfaces which will not be exposed after installation
- FIELD CONDITIONS

- C. Millwork fabricator shall comply with the following:
 - 1. Have a minimum of five (5) years documented experience and shall have completed projects of similar scope and size to the work of this project.
 - 2. Have technologically advanced woodworking facilities employing the use of modern equipment and techniques for fabricating and finishing to meet the level of quality for the manufacture of all fabrication specified.
 - 3. Employ skilled workmen experienced in the fabrication and finishing of premium quality millwork.
 - 4. Be responsible for fabrication, finishing and installation of all products and procedures specified in this Section.

- D. Comply with the indicated standards as applicable for the following types of architectural woodwork
 - 1. Lumber: AWI Section 100.
 - 2. Standing and running trim: AWI Section 300.
 - 3. Miscellaneous work: AWI Section 700.
 - 4. Finishing: AWI Section 1500.
 - 5. Installation of woodwork: AWI Section 1700.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Protect woodwork during transit, delivery, storage and handling to prevent damage, soiling and deterioration. Do not deliver woodwork until painting, wet work, grinding and similar operations which could damage, soil or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, woodwork must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

1.06 FIELD CONDITIONS

- A. The installer shall examine the substrates and conditions under which the work is to be installed; and notify the Contractor in writing of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer

- B. Environmental Limitations: Do not deliver or install trim or solid surfacing 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.

PART 2 - PRODUCTS

2.01 ARCHITECTURAL WOODWORK FABRICATORS

- A. Fabricators: Subject to compliance with requirements available fabricators offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Easley & Easley Millwork, Inc., Jackson, MS. Tel. (601) 372-8881.
 - 2. Scanlon -Taylor Millwork Company, Jackson, MS. Tel. (601) 362-5333.
 - 3. Southeastern Constructors, Inc., Brandon, MS. Tel. (601) 825-9791.

2.02 BASIC MATERIALS AND FABRICATION METHODS

- A. Except as otherwise indicated, comply with the following requirements for architectural woodwork not specifically indicated as pre-fabricated or pre-finished standard products.
- B. Wood Moisture Content: Provide kiln-dried lumber and maintain optimum 8 to 13 percent range (damp region) moisture content in solid wood (hardwood and softwood) through fabrication, installation, and finishing operations of interior Work.
- C. Wood for Painted Finish: Comply with AWI quality standards for selection of species, grade and cut (fabricator's option, except as otherwise indicated). Wood for trim shall be maple or other closed-grain hardwood subject to Project Engineer/ MDOT Architect's prior approval.
- D. Design and Construction Features: Comply with the details shown for profile and construction for architectural woodwork; and where not otherwise shown, comply with applicable Quality Standards, with alternate details at fabricator's option.
- E. Measurements: Before proceeding with fabrication of woodwork required to be fitted to other construction, obtain measurements and verify dimensions and shop drawing details as required for accurate fit. Where sequence of measuring substrates before fabrication would delay the project, proceed with fabrication (without field measurements) and provide ample borders and edges to allow for subsequent scribing and trimming of woodwork for accurate fit.

2.03 SOLID SURFACE SILLS

- A. Fabricate window sills as details on drawings of 3/4 inch solid surface polymer acrylic sheets constructed from cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting requirements of ANSI Z124.3 or ANSI Z124.6. Superficial damage to a depth of 0.010 inch shall be repairable by sanding and/or polishing. Exposed outside corners and edges shall have a 1/8 inch radius. Manufacturer's standard one- or two-part adhesive kit to create inconspicuous, nonporous joints.
 - 1. Manufacturer: DuPont Corian, or equal
 - 2. Color to be selected

2.04 MISCELLANEOUS MATERIALS

- A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln dried to less than 15 percent moisture content
- B. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls and at floors.
- C. Adhesives: Do not use adhesives that contain urea formaldehyde.

2.05 FABRICATION

- A. Complete fabrication, including assembly, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Before installation, condition materials to average prevailing humidity conditions in installation areas.
- B. Deliver anchoring devices to be built into substrates, well in advance of the time substrates are to be built. Prior to installation of architectural woodwork, examine shop fabricated work for completion, and complete work as required, including back priming and removal of packing.

3.02 INSTALLATION

- A. Install the work plumb, level, true and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8-inch in 8 feet for plumb and level (including countertops); and with 1/16-inch maximum offsets in revealed adjoining surfaces. Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
- B. Secure woodwork with anchors or blocking built-in or directly attached to substrates. Attach to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation.
- C. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns, miter at corners, and comply with Quality Standards for joinery.

3.03 PREPARATION FOR SITE FINISHING

- A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth ready for painted or stained finishes.

3.04 ADJUSTMENT, CLEANING, FINISHING AND PROTECTION

- A. Repair damaged and defective woodwork wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.
- C. Refer to Section 09 90 00 for final finishing of installed painted and stained architectural woodwork.
- D. Protection: The Installer of architectural woodwork shall advise the Contractor of final protection and maintenance conditions necessary to ensure that the Work will be without damage or deterioration at the time of acceptance

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Flashing and sheet metal work as indicated on the Drawings and provisions of this Specification. The types of work include the following:
 - a. Metal flashing and counter flashing.

1.02 ACTION SUBMITTALS

A. Product Data: Manufacturer's product data, technical specifications, installation instructions and general recommendations for each specified sheet material and fabricated product for Project Engineer / MDOT Architect's approval.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Distinguish between shop- and field-assembled work.
3. Include identification of finish for each item.
4. Include pattern of seams and details of termination points, expansion joints and expansion-joint covers, direction of expansion, and connections to adjoining work.

C. Samples: Submit 2 samples, eight inch square, of specified sheet materials to be exposed as finished surfaces. Submit 2 twelve inches long, completely finished units of specified factory-fabricated products exposed as finished work. Submit 2 color charts of manufacturer's complete line of standard colors available.

1.03 INFORMATIONAL SUBMITTALS

A. Qualification Data: Submit 2 copies for firms and persons that demonstrate capabilities and experience. Include a list with five (5) completed Project names and addresses, and name and addresses of Architects and Owners.

B. Product certificates.

C. Product test reports.

D. Sample warranty.

1.04 CLOSEOUT SUBMITTALS

A. Maintenance data.

1.05 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.
 - 1. For copings and roof edge flashings that are SPRI ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

1.06 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.
 - 1. Finish Warranty Period: 20 years from Date of Completion.

PART 2 - PRODUCTS

2.01 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 NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.
- C. Recycled Content of Steel-Sheet Flashing and Trim: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.02 FLASHING AND SHEET METAL MATERIALS

- 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 coating designation or aluminum-zinc alloy-coated steel sheet according to ASTM A 792/A 792M, Class AZ50 coating designation, Grade 40; prepainted by coil-coating process to comply with ASTM A 755/A 755M.
 - 1. Thickness: 24 gage.

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.
 - a. Equal to Petersen Aluminum Corp., Tel. (800) 722-2523.
 - b. Use galvanized finish where concealed from view only.

2.03 MISCELLANEOUS MATERIALS

- A. General: Provide materials and types of fasteners, solder, 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.
 2. Fasteners for Zinc-Coated (Galvanized) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
- C. Solder For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent
- D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.
- E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane, polysulfide and / or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
- F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.
- G. Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior nonmoving joints, including riveted joints.
- H. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

2.04 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. Obtain field measurements for accurate fit before shop fabrication.
 - 2. 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.
 - 3. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.
- B. 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 deep, filled with butyl sealant concealed within joints.
 - 2. Use lapped expansion joints only where indicated on Drawings.
- C. 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.
- D. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.
- E. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard for application, but not less than thickness of metal being secured.
- F. Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
- 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. Rivet joints where necessary for strength.

PART 3 - EXECUTION

3.01 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 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.
- B. 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. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.
- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.
 2. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes that penetrate [wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws. Substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. 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.
- F. Seal joints as required for watertight construction. Prepare joints and apply sealants to comply with requirements in Section 07 92 00 - Joint Sealants.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.
1. Do not solder metallic-coated steel sheet.
 2. Do not use torches for soldering.
 3. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.02 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.
- B. Through-Wall Flashing: Installation of through-wall flashing is specified in Section 04 20 00 - Unit Masonry.
- C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.03 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.
- E. Protection: Installer shall advise Contractor of required procedures for surveillance and protection of flashings, sheet metal work, and accessories during construction, to ensure that work will be without damage or deterioration, other than natural weathering, at time of substantial completion.
- F. Flashings and sheet metal with cuts, abrasions, or imperfections will not be acceptable and is to be replaced.

END OF SECTION

SECTION 07 84 00 FIRESTOPPING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Firestopping as indicated on the drawings, specified herein, and/or required for completion of the work. Firestopping shall be required at all rated fire and smoke "fire barrier" walls and at floors.

1.02 SUBMITTALS

- A. Submit manufacturer's product data, specifications and installation procedures for each type of firestopping and accessory required. Submit detailed location where each will be used. Submit UL data for assemblies where shown on the Drawings.

1.03 QUALITY ASSURANCE

- A. Penetrations and miscellaneous openings in rated fire and smoke "fire barrier" walls shall be protected in accordance with NFPA 101, Life Safety Code, Chapter 6, Features of Fire Protection. All openings for air-handling ductwork or air movement, pipes, conduits, bus ducts, cables, wires, air ducts, pneumatic tubes and ducts and similar building service equipment that pass through or penetrate in any way a rated fire or smoke "fire barrier" wall or floor shall be protected. All firestopping materials used shall conform to ASTM E814, ASTM E119, and UL 1479 and tested in accordance with NFPA 90A and NFPA 251 as part of a rated assembly.

1.04 FIRE AND SMOKE PARTITIONS AND RELATED ASSEMBLIES

- A. Based on Underwriters Laboratories (UL) systems and tests and are designed in accordance with UL fire resistance ratings. Contractor shall comply with the applicable UL requirements for fire and smoke partitions and assemblies shown on the drawings.
- B. Materials not conforming to these firestopping specifications shall not be used. Materials that are not UL rated and approved shall not be allowed. Materials containing asbestos are not acceptable and shall not be used in this project.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Deliver packaged materials in manufacturer's original unopened containers and store in weathertight enclosure. Handle and store all materials so as to prevent inclusion of foreign materials, breakage or damage by water.

1.04 WORKMANSHIP

- A. Materials and workmanship not conforming to provisions of the Specifications and manufacturer's printed instructions shall be rejected at any time during the course of the work. Rejected materials shall be removed from the site at the time of rejection. Rejected workmanship shall be corrected immediately after rejection.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Equivalent products by the following manufacturers are acceptable:
 - 1. Hilti, Inc., Tulsa, OK. Tel. (800) 879-8000.
 - 2. International Protective Coatings Corp., Hatfield, PA. Tel. (800) 334-8796.
 - 3. 3M Fire Protection Products, Saint Paul, MN. Tel. (800) 328-1687.
 - 4. United States Gypsum Company, Chicago, IL. Tel. (880) 874-4968.
- B. Substitutions shall fully comply with specified requirements and Section 01 62 14-Product Options and Substitution Procedures.

2.02 SEALANT

- A. Equal to Hilti, Inc. FS-One.

2.03 CAULKING AND PUTTY

- A. Equal to 3M Brand Fire Barrier CP- 25 Caulk and Putty 303.

2.04 PENETRATION SEALANTS

- A. Equal to 3M Fire Barrier Penetration Sealing Systems 7902 and 7904 series as required.

2.05 INSULATION

- A. Equal to United States Gypsum Company "Therafiber" Safing Insulation, 4 pcf density, unfaced.

2.06 INTUMESCENT FIRESTOPPING

- A. Equal to Hilti, Inc. FS-One, CP 642 and FS 657 Fire Block as required.

2.07 ACCESSORIES

- A. Provide backing / filling materials, retainers, collars, clamps, sleeves, primers and other necessary items of types and duration required by regulatory requirements and / or as recommended by product manufacturer for the specific substrates, surfaces and applications.

2.08 FINISHES

- A. Concealed locations: Manufacturer's Standards.
- B. Exposed to View Locations: "Custom" Colors as selected by Project Engineer / MDOT Architect unless Manufacturer's Standards closely matches finish of penetrated surfaces.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Installation of firestopping materials for small openings, cracks, crevices, and penetrations shall be in accordance with manufacturer's printed instructions.
- B. Verify application required and location for each type of firestopping to be used and conform to manufacturer's exact instructions for specific applications.
- C. After installation of all Work, including but not limited to ductwork, fire and smoke dampers, communication cabling, electrical conduit, etc., properly seal all openings, cracks, crevices and penetrations throughout the entire project, to maintain fire ratings shown.
- D. Install fireproof sealant at all penetrations through rated walls and floors and at top and bottom on each side of rated walls.
- E. Install approved metal sleeves with fireproof sealant at all communication and control wiring passing through rated walls throughout the entire project.
- F. Install firestopping at fire and smoke walls and floors where construction passes through those areas.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Preparation of substrate surfaces to receive materials.
- B. Sealant and joint backing (backer rod) materials and installation in the following general locations (even though not shown on the Drawings):
 - 1. Exterior and interior wall joints, including control / expansion joints and abutting like or similar materials (in walls, ceilings, and roof construction) that have spaces between in excess of 3/16 inch (except where less restrictive tolerances are indicated or where the condition is specifically the responsibility of others).
 - 2. Abutting dissimilar materials, exterior and interior.
 - 3. Exterior and interior wall openings (including at perimeter doors, exterior thresholds, windows, louvers, and penetrations required by piping, ducts, and other service and equipment, except for sealants provided by Section 07 84 00-Firestopping).
 - 4. Other locations, not included above but, specifically required by manufacturers of installed materials / products (except that sealing materials for glazing are under provision of other Section.).
- C. Accessories: Including, but not limited to, primer, cleaner, backer rod, bond breaker, and masking tape.

1.02 DEFINITIONS

- A. Wherever the words "caulk" or "seal" occur, they shall be interpreted to mean "effectively seal the indicated joint with a material to render it air and watertight." "Caulk" shall indicate the use of the interior materials specified hereinafter and "Seal" shall indicate the use of the exterior materials.

1.03 WORK OF OTHER SECTIONS

- A. Caulking and sealing may be performed as Work of other Sections when specified. However, all Work shall conform to the requirements of this Section.

1.04 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions for each type of sealant required. Product data shall include chemical characteristics, limitations, and color availability.

1.05 QUALITY ASSURANCE

- A. Applicator: Company specializing in the work of this Section with minimum 3 years documented satisfactory experience.
- B. Manufacturer's Certificate: Provide manufacturer's letter of certification that products meet or exceed specified requirements and are appropriate for uses indicated.
- C. Installation: Conform to Sealant and Waterproofers Institute requirements.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver caulking and sealant material to the site in original unopened packages with manufacturer's labels, instructions and product identification and lot numbers intact and legible.
- B. Store materials under cover, protected from inclement weather and adverse temperature extremes, in original containers or unopened packages, in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and Specifications are based on products manufactured by Pecora Corporation, 165 Wambold Road, Harleysville, PA 19438. Tel: (800) 523-6688.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Dow Corning Corporation, Midland, MI. Tel: (800) 322-8723
 - 2. GE Silicones, Waterford, NY. Tel: (518) 233-2639.
 - 3. Sonneborn Building Products, Shakopee, MN. Tel: (800) 433-9517.
 - 4. Tremco, Inc., Beachwood, OH. Tel: (800) 562-2728.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 SEALANT TYPES AND USE SCHEDULE

- A. Type 1: Use for interior locations, sealing around windows, doors, louvers, drywall and other locations to be painted and where joints are less than 1/8 inch with none to slight movement anticipated: Pecora AC-20 + Silicone (Acrylic Latex Caulking Compound).
- B. Type 2: Use for exterior sealing at door, louver, and window frames at masonry, and other materials: Pecora 890NST (one-part Architectural Silicone Sealant). Color(s) to be selected by the Project Engineer / MDOT Architect from manufacturer's full range of standard Architectural colors.

2.03 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Backer Rod: Open cell polyurethane foam or closed cell polyethylene foam, compatible with sealant, sized and shaped to provide proper compression upon insertion in accordance with manufacturer's recommendations.
- D. Bond Breaker: Pressure sensitive adhesive polyethylene, TEFLON, or polyurethane foam tape.
- E. Masking Tape: Pressure sensitive adhesive paper tape.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Installer must examine areas and conditions under which this Work is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.02 PREPARATION

- A. **Cleaning:** Clean joint surfaces, using joint cleaner as necessary, to remove dust, dirt, oil, grease, rust, lacquers, laitance, release agents, moisture, frost or other matter that might adversely affect adhesion of sealant. Rake joints out to a depth equal to one-half the width.
- B. **Masking:** Mask areas adjacent to joints.
- C. **Priming:** If required, prime substrate surfaces following manufacturer's instructions.
- D. **Mixing:** When required, mix components of sealant materials in accordance with manufacturer's instructions to achieve required characteristics of sealant.

3.03 APPLICATIONS

- A. Mixing, application, surface condition, weather condition shall be as recommended by the manufacturer. Do not use material that has exceeded the recommended pot life.
- B. Install backing material in joints using blunt instrument to avoid puncturing. Do not twist the backing rod while installing. Install backing rod so that joint depth is 50 percent of joint width, but a minimum of 1/8-inch deep and a maximum of 3/8-inch deep.
- C. Apply sealant in joints using a pressure gun with nozzle cut to fit joint width. Ensure sealant is deposited in a uniform, continuous bead without gaps or air pockets.
- D. Tool joints to the required configuration within 10 minutes of sealant application. Remove masking materials immediately after tooling.

3.04 CLEANING AND REPAIRING

- A. Do not allow sealant or compounds to overflow or spill onto adjoining surfaces, or to migrate into voids of adjoining surfaces. Clean adjoining surfaces by whatever means necessary to eliminate evidence of spillage.
- B. When using flammable solvents, avoid heat, sparks and open flames. Provide necessary ventilation. Follow all precautions and safe handling recommendations from the solvent manufacturer and pertinent local, state and federal regulations.
- C. Leave finished work in a neat, clean condition with no evidence of spillovers onto adjacent surfaces.
- D. Repair or replace defaced or disfigured finishes.

3.04 CURE AND PROTECTION

- A. Cure sealant and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability.
- B. Sealant Supplier / Applicator shall advise Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at Time of Completion.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Hollow metal Work, including but not limited to, the following:
 - 1. Interior and exterior hollow metal doors and frames; rated and non-rated.
 - 2. Trimmed openings.
 - 3. Preparation of metal doors and bucks to receive finish hardware, including reinforcements, drilling and tapping necessary.
 - 4. Preparation of hollow metal door to receive glazing (where required).
 - 5. Factory prime painting of Work in this Section.

1.02 RELATED SECTIONS

- A. Section 06 10 00 - Rough Carpentry.
- B. Section 08 71 00 - Door Hardware.
- C. Section 08 80 00 - Glazing.
- D. Section 09 05 15 - Color Design.
- E. Section 09 90 00 - Painting and Coating.

1.03 QUALITY ASSURANCE

- A. In addition to complying with all pertinent codes and regulations, manufacture labeled doors in accordance with specifications and procedures of Underwriters' Laboratories, Inc. In guarantee and shop drawings, comply with nomenclature established in American National Standards Institute publication A123.1, latest edition, "Nomenclature for Steel Doors and Steel Door Frames".
- B. Work is subject to applicable portions of the following standards:
 - 1. ANSI A115 "Door and Frame Preparation for Door Locks and Flush Bolts", American National Standards Institute.
 - 2. ANSI A123.1 "Nomenclature for Steel Doors and Steel Door Frames", American National Standards Institute.
 - 3. NFPA 80 "Fire Doors and Windows", National Fire Protection Association.
 - 4. NFPA 101 "Life Safety Code", National Fire Protection Association.
- C. Hollow metal doors and frames shall comply with the specifications for Custom Hollow Metal Doors and Frames, National Assoc. of Architectural Metal Manufacturers (NAAMM) Standard CHM 1-74, and the Steel Door Institute, SDI 100-80.

1.04 SUBMITTALS

- A. Product Data: Submit schedule and manufacturer's technical product data / literature.
- B. Shop Drawings: Shop drawings shall indicate door and frame elevations, frame configuration, anchor types and spacing, reinforcement, location of cut-outs for hardware, and glazing.

- C. Samples (not required for named products):
 - 1. Submit hollow metal frame, corner section of typical frame, of sufficient size to show corner joint, hinge reinforcement, dust cover boxes, anchors, and floor anchors.
 - 2. Submit hollow metal door section of typical door, of sufficient size to show edge, top and bottom construction, insulation, hinge reinforcement, face stiffening, corner of vision opening construction, and glazing beads.

1.05 PRODUCT IDENTIFICATION

- A. Deliver doors and frames and other work of this section properly tagged and identified.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle all metal doors and frames in a manner to prevent damage and deterioration.
- B. Provide packaging, separators, banding, spreaders, and individual wrappings as required to completely protect all metal doors and frames during transportation and storage.
- C. Store doors upright, in a protected dry area, at least 4 inches off the ground and with at least 1/4 inch air space between individual pieces, protect all pre-finished and hardware surfaces.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by Steelcraft Manufacturing Company, 9017 Blue Ash Road, Cincinnati, OH 45242 Tel. (513) 745-6400.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Amweld Building Products, Inc., Garrettsville, OH. Tel. (330) 527-4385.
 - 2. Ceco Door Products, Brentwood, TN. Tel. (615) 661-5030.
 - 3. Republic Builders Products, McKenzie, TN. Tel. (901) 352-3383.
- C. Substitutions shall fully comply with specified requirements and Section 01 62 14-Product Options and Substitution Procedures.

2.02 FABRICATION

- A. Fabricate hollow metal units rigid, neat in appearance and free from defects, warp or buckle. Accurately form metal to required sizes and profiles. Weld exposed joints continuously, grind, dress, and make smooth, flush and invisible. Metallic filler to conceal manufacturing defects is not acceptable. Unless otherwise indicated, provide countersunk flat Philips or Jackson heads for exposed screws and bolts.
- B. Prepare hollow metal units to receive finish hardware, including cutouts, reinforcing, drilling and tapping per final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A115 "Specifications for Door and Frame Preparation for Hardware".

- C. Locate finish hardware in accordance with approved shop drawings.
2.03 FRAMES

- A. Frames for exterior openings shall be made of commercial grade 14 gage minimum cold rolled steel conforming to ASTM A366-68 with a zinc coating conforming to ASTM A653, with a coating designation of A60 or G60 and a minimum coating thickness of 0.60 oz. per sq. ft. minimum. Frames for interior openings shall be commercial grade cold rolled steel conforming to ASTM A366-68 or commercial grade hot rolled and pickled steel conforming to ASTM A569-66T. Metal thickness shall be 16 gage for frames in openings 4 feet or less in width; 14 gage for frames in openings over 4 feet in width.
- B. Design and Construction: Frames shall be custom made welded units with integral trim, of the sizes and shapes shown on approved shop drawings. Knocked-down frames will not be accepted. Finished work shall be strong, rigid, and neat in appearance, square, true and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths. Jamb depths, trim, profile and backbends shall be as shown on Drawings. Corner joints shall have contact edges closed tight, with trim faces mitered and continuously welded, and stops mitered. The use of gussets will not be permitted.
1. Stops shall be 5/8 inch deep. Cut-off (sanitary or hospital type) stops, where scheduled, shall be capped at 45 degrees at heights shown on drawings, and all jamb joints below cut-off stops shall be ground and filed smooth, making them imperceptible. Do not cut off stops on frames for soundproof, lightproof or lead-lined doors.
 2. When shipping limitations so dictate, frames for large openings shall be designed and fabricated for field splicing by others.
 3. Frames for multiple or special openings shall have mullion and / or rail members which are closed tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.
 4. Hardware reinforcements: Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated mortised hardware only, in accordance with approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates. Frames shall be reinforced for closers. Minimum thickness of hardware reinforcing plates shall be as follows:
 - a. Hinge and pivot reinforcements - 7 gage, 1 1/4 inches by 10 inches minimum.
 - b. Strike reinforcements - 12 gage.
 - c. Flush bolt reinforcements - 12 gage.
 - d. Closer reinforcements - 12 gage.
 - e. Reinforcements for surface-mounted hardware - 12 gage.
 5. Floor anchors: Floor anchors shall be securely welded inside jambs for floor anchorage. Where required, provide adjustable floor anchors, providing not less than 2 inches height adjustment. Floor anchors shall be 14-gage minimum.
- C. Finish: After fabrication, tool marks and surface imperfections shall be removed, and exposed faces of welded joints shall be dressed smooth. Frames shall be chemically treated to insure maximum paint adhesion and coated on accessible surfaces with rust-inhibitive primer complying with FS-TT-P-57 (Type II) or FS-TT-P-659 with 2.0 mils minimum thickness. Fully cure before shipment.

2.04 HOLLOW METAL DOORS

- A. Doors shall be made of commercially quality, level, cold rolled steel conforming to ASTM A366-68 and free of scale, pitting or other surface defects. Face sheets for interior doors shall be 18 gage minimum. Face sheets for exterior doors shall be 16-gage minimum with zinc coating conforming to ASTM A653, with a coating designation of A60 or G60 and a minimum coating thickness of 0.60 oz. per sq. ft. minimum.
- B. Design and Construction: Doors shall be custom made, of the types and sizes shown on the approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Door thickness shall be 13/4 inches unless otherwise noted. Doors shall be strong, rigid and neat in appearance, free from warp or buckle. Corner bends shall be true, straight and of minimum radius for the gage of metal used.
- C. Stiffen face sheets with continuous vertical formed steel sections spanning the full thickness of the interior space between door faces. These stiffeners shall be 22 gage minimum, spaced 6 inches apart and securely attached to face sheets by spot welds 5 inches on center. Spaces between stiffeners shall be sound-deadened insulated full height of door with an inorganic non-combustible batt-type material.
- D. Join door faces at their vertical edges by a continuous weld extending full height of door. Welds shall be ground, filled and dressed smooth to make them invisible and provide a smooth flush surface.
- E. Top and bottom edges of doors shall be closed with a continuous recessed 16 gage minimum steel channel, extending the full width of the door and spot welded to both faces. Exterior doors shall have additional flush closing channel at top edges and, where required for attachment of weather-stripping, a flush closure at bottom edges. Provide openings in bottom closure of exterior doors to permit escape of entrapped moisture.
- F. Edge profiles shall be provided on both vertical edges of doors as follows:
1. Single-acting swing doors - beveled 1/8 inch in 2 inches.
 2. Double-acting swing doors - rounded on 2-1/8 inch radius.
- F. Hardware reinforcements: Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only, in accord with the approved hardware schedule and templates provided by the hardware supplier. Where surface-mounted hardware (or hardware, the interrelation of which is to be adjusted upon installation - such as top and bottom pivots, floor closures, etc.) is to be applied, doors shall have reinforcing plates. Minimum gages for hardware reinforcing plates shall be as follows:
1. Hinge and pivot reinforcement - 7 gage.
 2. Reinforcement for lock face, flush bolts, concealed holders, concealed or surface-mounted closers - 12 gage.
 3. Reinforcements for all other surface mounted hardware - 16 gage.
- G. Glass moldings and stops:

1. Where specified or scheduled, doors shall be provided with hollow metal moldings to secure glazing by others per glass opening sizes shown on Drawings. Fixed moldings shall be securely welded to door on security side.
 2. Loose stops shall be 20-gage steel, with mitered corner joints, secured to the framed opening by cadmium or zinc-coated countersunk screws spaced 8 inches on center. Snap-On attachments will not be permitted. Stops shall be flush with face of door.
- H. Finish: After fabrication, tool marks and surface imperfections shall be dressed, filled and sanded as required to make all faces and vertical edges smooth, level and free of all irregularities. Doors shall be chemically treated to ensure maximum paint adhesion and shall be coated, on all exposed surfaces, with manufacturer's standard rust-inhibitive primer. Fully cure before shipment.
- I. Flatness: Doors shall maintain a flatness tolerance of 1/16 inch maximum in any direction, including a diagonal direction.
- 2.05 HOLLOW METAL PANELS
- A. Hollow metal panels shall be made of the same materials and constructed and finished in the same way as specified for hollow metal doors.
- 2.06 LABELED DOORS & FRAMES
- A. Labeled doors and frames shall be provided for those openings requiring fire protection ratings, and as scheduled on Drawings. Such doors and frames shall be Underwriters' Laboratories, Inc. labeled or other nationally recognized agency having a factory inspection service.
- B. When door or frame specified to be fire-rated cannot qualify for appropriate labeling because of its design, size, hardware or any other reason, the Project Engineer / Architect shall be advised before fabricating work on that item is started.
- 2.07 HARDWARE LOCATIONS
- G. Hardware is to be installed at heights and locations per the Building Code, 2010 ADA, and manufacturer's recommendations.
- 2.08 CLEARANCES
- A. Edge clearances:
1. Between doors and frame, at head and jambs - 1/8 inch.
 2. At door sills: where no threshold is used - 1/4 inch maximum above finished floor; where threshold is used - 3/4 inch maximum above finished floor.
 3. Between meeting edges of pairs of doors - 1/8 inch.
- B. Finished floor is defined as top surface of floor, except when resilient tile or carpet is used, when it is top of concrete slab. Where carpet is more than 1/2 inch thick, allow 1/4 inch clearance.
- 2.09 PREPARATION FOR FINISH HARDWARE
- A. Hardware supplier shall furnish hollow metal manufacturer approved hardware schedule, hardware templates, and samples of physical hardware where necessary to ensure correct fitting and installation. Include preparation for mortise and concealed hardware.

- B. Provide reinforcements for both concealed and surface applied hardware. Drill and tap mortise reinforcements at factory, using templates. Install reinforcements with concealed connections designed to develop full strength of reinforcements.

2.10 REJECTION

- A. Hollow metal frames or doors which are defective, have hardware cutouts of improper size or location, or which prevent proper installation of doors, hardware or work of other trades, shall be removed. Replace rejected materials.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine areas and conditions where hollow metal Work is to be installed and notify Project Engineer of conditions detrimental to proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install hollow metal units and accessories in accordance with approved Shop Drawings, manufacturer's data, and Specifications.
- B. Provide masonry anchorage devices where required for securing hollow metal frames to in-place concrete or masonry construction. Set anchorage devices opposite each anchor location, in accordance with details on final shop drawings and anchorage device manufacturer's instructions. Leave drilled holes rough, not reamed, and free from dust and debris.
- C. Placing frames: Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
 - 1. Make field splices in frames as detailed on final Shop Drawings, welded and finished to match factory work.
 - 2. Remove spreader bars only after frames or bucks have been properly set and secured.
 - 3. Door installation: Fit hollow metal doors accurately in their respective frames, with the following clearances:
 - a. Jambs and head: 3/32 inch.
 - b. Meeting edges, pairs of doors: 1/8 inch.
 - c. Bottom: 1/4 inch, where no threshold or carpet.
 - d. Bottom: at threshold or carpet: 1/8 inch.
 - e. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

END OF SECTION

SECTION 08 41 13

ALUMINUM-FRAMED STOREFRONT

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Aluminum-framed storefront system includes tubular aluminum sections with supplementary internal support framing as required, aluminum and glass entrances, shop fabricated, factory finished, glass and glazing, related flashing, anchorage and attachment devices.
- B. Related Sections:
 - 1. Section 07 92 00 – Joint Sealants.
 - 2. Section 08 80 00 – Glazing.

1.02 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's specifications for materials and fabrication of aluminum-framed storefront, and instructions and recommendations for installation and maintenance. Include certified test reports showing compliance with requirements where a test method is indicated. Submit product data for accessories.
- B. Shop Drawings: Submit drawings showing adaptation of manufacturer's standard system to project; include typical unit elevations at 1/2 inch scale and details at 3 inch scale, to show dimensioning, member profiles, anchorage system, interface with building construction, and glazing. Show section moduli of wind-load-bearing members, and calculations of stresses and deflections for performance under design loading. Show clearly on shop drawings where and how manufacturer's system deviates from Contract Drawings and these Specifications.
- C. Samples: Submit samples of each type and color of aluminum finish, on 12 inch long sections of extrusions of formed shapes and on 6 inch squares of sheet/plate. Include 2 or more samples in each set, showing near-limits of variations (if any) in color and texture of finish.
- D. Delegated-Design Submittal: For glazed aluminum-framed entrance and storefront walls indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.03 INFORMATIONAL SUBMITTALS

- A. Energy Performance Certificates: NFRC-certified energy performance values from manufacturer.
- B. Product test reports.
- C. Field quality-control reports.
- D. Sample warranties.

1.04 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: Installer experienced to perform work of this section who has at least five years experience in the installation of work similar to that required for this project and who is acceptable to product manufacturer.
- B. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction, approving acceptable installer and approving application method.
- C. Testing Agency Qualifications: Qualified according to ASTM E 699 for testing indicated.
- D. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Ordering Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- B. Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle storefront material and components to avoid damage. Protect material against damage from elements, construction activities, and other hazards before, during and after installation.

1.07 WARRANTY

- A. Special Assembly Warranty: Manufacturer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Final Completion.
- B. Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Warranty Period: 20 years from date of Final Completion.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 01 40 00 "Quality Requirements," to design glazed aluminum curtain walls.
- B. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum-framed entrance and storefront walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - 1. Glazed aluminum-framed entrance and storefront walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
 - 2. Failure also includes the following:
 - a. Thermal stresses transferring to building structure.
 - b. Glass breakage.
 - c. Noise or vibration created by wind and thermal and structural movements.
 - d. Loosening or weakening of fasteners, attachments, and other components.
 - e. Failure of operating units.
- C. Uniform Loads:
 - 1. A static air design load of 40 psf shall be applied in the positive and negative direction in accordance with ASTM E 330. There shall be no deflection in excess of $L/175$ of the span of any framing member at design load. At structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2 percent of their clear spans shall occur.
- D. Air Infiltration:
 - 1. The test specimen shall be tested in accordance with ASTM E 283. Air infiltration rate shall not exceed 0.06 cfm/ft² at a static air pressure differential of 6.24 pounds per square foot.
- E. Water Resistance, (Static):
 - 1. The test specimen shall be tested in accordance with ASTM E 331. There shall be no leakage at a static air pressure differential of 12 pounds per square foot as defined in AAMA 501.
- F. Water Resistance, (Dynamic): The test specimen shall be tested in accordance with AAMA 501.1. There shall be no leakage at an air pressure differential of 12 pounds per square foot as defined in AAMA 501.
- G. Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 73 for frame.
- H. Seismic: When tested to AAMA 501.4, system must meet design displacement of 0.010 x the story height and ultimate displacement of 1.5 x the design displacement.

- I. Sound Transmission Loss: When tested to ASTM E90, the Sound Transmission Class (STC) shall not be less than 34 based upon one inch insulating glass (1/4 inch glass, 1/2 inch air space, 1/4 inch glass).

2.02 MANUFACTURERS

- A. Drawings and Specifications are based on products as manufactured by Kawneer Company, Inc., 555 Guthridge Court, Norcross, GA 30092. Tel. (770) 449-5555.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. EFCO Corporation, Monett, MO. Tel. (800) 221-4169.
 - 2. Oldcastle Building Envelope, Terrell, TX. Tel. (866) 653-2278.
 - 3. Traco, Cranberry Township, PA. Tel. (724) 776-7000.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00 - Substitution Procedures and Section 01 60 00 - Product Requirements.

2.03 MATERIALS

- A. Aluminum-framed Storefront Framing: Kawneer Trifab VG 451 - 2 inches by 4-1/2 inches nominal dimensions; Screw Spline Fabrication.
 - 1. Material Standard: Extruded Aluminum, ASTM B 221, 6063-T5 or 6063-T6 alloy and temper.
 - 2. Member Wall Thickness: Each framing member shall have a wall thickness sufficient to meet the specified structural requirements
 - 3. Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront wall members are nominal and in compliance with AA Aluminum Standards and Data.

2.04 ACCESSORIES

- A. Fasteners: Where exposed, shall be Stainless Steel.
- B. Gaskets: Glazing gaskets shall comply with ASTM C 864 and be extruded of a silicone compatible EPDM rubber that provides for silicone adhesion.
- C. Perimeter Anchors: Aluminum. When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.
- D. Thermal Barrier: Thermal separator shall be extruded of a silicone compatible elastomer that provides for silicone adhesion.

2.05 FABRICATION

- A. General:
 - 1. Fabricate components per manufacturer's installation instructions and with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
 - 2. Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.
 - 3. Prepare components to receive anchor devices. Fabricate anchors.
 - 4. Arrange fasteners and attachments to conceal from view.

2.06 ALUMINUM FINISHES

- A. High-Performance Organic Finish: Two-coat fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.

- 1. Color and Gloss: Finish to match existing entrance doors and frames.

2.07 SOURCE QUALITY CONTROL

- A. Source Quality: Provide aluminum-framed storefront specified herein from a single source.

- 1. Building Enclosure System: When aluminum-framed storefront are part of a building enclosure system, including hardware, windows, storefront framing and related products, provide building enclosure system products from a single source manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions: Verify substrate conditions (which have been previously installed under other sections) are acceptable for product installation in accordance with manufacturer's instructions. Verify openings are sized to receive curtain wall system and sill plate is level in accordance with manufacturer's acceptable tolerances.

- 1. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

3.02 INSTALLATION

- A. General: Install aluminum-framed storefront systems plumb, level, and true to line, without warp or rack of frames with manufacturer's prescribed tolerances and installation instructions. Provide support and anchor in place.

- 1. Dissimilar Materials: Provide separation of aluminum materials from sources of corrosion or electrolytic action contact points.
 - 2. Glazing: Glass shall be outside glazed and held in place with extruded aluminum pressure plates anchored to the mullion using stainless steel fasteners spaced no greater than 9" on center.
 - 3. Water Drainage: Each light of glass shall be compartmentalized using joint plugs and silicone sealant to divert water to the horizontal weep locations. Weep holes shall be located in the horizontal pressure plates and covers to divert water to the exterior of the building.

3.03 PROTECTION AND CLEANING

- A. Protection: Protect installed product's finish surfaces from damage during construction. Protect aluminum-framed entrance and storefront system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.
- B. Cleaning: Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions. Clean units and glazing again no more than one week prior to Substantial Completion. Remove construction debris from project site and legally dispose of debris.

END OF SECTION

SECTION 08 71 00 DOOR HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes commercial door hardware for the following:
 - 1. Swinging doors.
 - 2. Other doors to the extent indicated.
- B. Door hardware includes, but is not necessarily limited to, the following:
 - 1. Mechanical door hardware.
 - 2. Cylinders specified for doors in other sections.
- C. Related Sections:
 - 1. Division 06 Section "Rough Carpentry".
 - 2. Division 08 Section "Hollow Metal Doors and Frames".
- D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ICC/IBC - International Building Code.
 - 3. NFPA 70 - National Electrical Code.
 - 4. NFPA 80 - Fire Doors and Windows.
 - 5. NFPA 101 - Life Safety Code.
 - 6. NFPA 105 - Installation of Smoke Door Assemblies.
 - 7. State Building Codes, Local Amendments.
- E. Standards: All hardware specified herein shall comply with the following industry standards:
 - 1. ANSI/BHMA Certified Product Standards - A156 Series
 - 2. UL10C – Positive Pressure Fire Tests of Door Assemblies

1.02 SUBMITTALS

- A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.
- B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - 1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
 3. Content: Include the following information:
 - a. Type, style, function, size, label, hand, and finish of each door hardware item.
 - b. Manufacturer of each item.
 - c. Fastenings and other pertinent information.
 - d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
 - e. Explanation of abbreviations, symbols, and codes contained in schedule.
 - f. Mounting locations for door hardware.
 - g. Door and frame sizes and materials.
 - h. Warranty information for each product.
 4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.
- C. Proof of Certification: Provide copy of manufacturer(s) official certification or accreditation document indicating proof of status as a qualified installer of Windstorm assemblies.
- D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.
- E. Informational Submittals:
1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
- F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals.
- 1.03 QUALITY ASSURANCE
- A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
 - B. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

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

1.04 DELIVERY, STORAGE, AND HANDLING

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

1.05 COORDINATION

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

1.06 WARRANTY

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

1.07 MAINTENANCE SERVICE

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

PART 2 - PRODUCTS

2.01 SCHEDULED DOOR HARDWARE

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

2.02 HANGING DEVICES

- A. Hinges: ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets.
 - 1. Quantity: Provide the following hinge quantity, unless otherwise indicated:
 - a. Two Hinges: For doors with heights up to 60 inches.
 - b. Three Hinges: For doors with heights 61 to 90 inches.
 - c. Four Hinges: For doors with heights 91 to 120 inches.
 - d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.
 - 2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
 - a. Widths up to 3'-0": 4-1/2 inches standard or heavy weight as specified.
 - b. Sizes from 3'-1" to 4'-0": 5 inches standard or heavy weight as specified.
 - 3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:
 - a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
 - b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
 - 4. Hinge Options: Comply with the following where indicated in the Hardware Sets or on Drawings:
 - a. Non-removable Pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Acceptable Manufacturers:
 - a. Bommer Industries (BO).
 - b. Hager Companies (HA).
 - c. McKinney Products (MK).

2.03 DOOR OPERATING TRIM

- A. Flush Bolts and Surface Bolts: ANSI/BHMA A156.3 and A156.16, Grade 1, certified.
 1. Manual flush bolts to be furnished with top rod of sufficient length to allow bolt location approximately six feet from the floor.
 2. Furnish dust proof strikes for bottom bolts.
 3. Surface bolts to be minimum 8 inches in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
 4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.
 5. Acceptable Manufacturers:
 - a. Rockwood Manufacturing (RO).
 - b. Trimco (TC).
- B. Door Push Plates and Pulls: ANS/BHMA A156.6 certified door pushes and pulls of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.
 1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
 2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
 3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
 4. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.
 5. Acceptable Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).

2.04 CYLINDERS AND KEYING

- A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
- B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices, unless otherwise indicated.
- C. Cylinders: Original manufacturer cylinders complying with the following:
 1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 2. Rim Type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
 3. Bored-Lock Type: Cylinders with tailpieces to suit locks.

4. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
 5. Keyway: Match Facility Standard.
- D. Keying System: Each type of lock and cylinders to be factory keyed. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
1. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 2. Existing System: Key locks to Owner's existing system.
 3. New System: Key locks to a new key system as directed by the Owner.
- E. Key Quantity: Provide the following minimum number of keys:
1. Change Keys per Cylinder: Two (2)
 2. Master Keys (per Master Key Level/Group): Five (5).
 3. Construction Keys (where required): Ten (10).
- F. Construction Keying: Provide construction master keyed cylinders.
- G. Key Registration List (Bitting List):
1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 2. Provide transcript list in writing or electronic file as directed by the Owner.

2.05 MECHANICAL LOCKS AND LATCHING DEVICES

- A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) – ML2000 Series.
 - b. Sargent Manufacturing (SA) – 8200 Series.
 - c. Yale Locks and Hardware (YA) – 8800FL Series.
- B. Lock Trim Design: As specified in Hardware Sets.

2.06 AUXILIARY LOCKS

- C. Mortise Deadlocks, Small Case: ANSI/BHMA A156.5, Grade 1, certified small case mortise type deadlocks constructed of heavy gauge wrought corrosion resistant steel. Steel or stainless steel bolts with a 1" throw and hardened steel roller pins. Deadlocks to be products of the same source manufacturer and keyway as other specified locksets.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DL4100 Series.
 - b. Sargent Manufacturing (SA) - 4870 Series.
 - c. Yale Locks and Hardware (YA) - 350 Series.

2.07 LOCK AND LATCH STRIKES

- A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
 2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
 3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- B. Standards: Comply with the following:
1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 2. Strikes for Bored Locks and Latches: BHMA A156.2.
 3. Strikes for Auxiliary Deadlocks: BHMA A156.5.
 4. Dustproof Strikes: BHMA A156.16.

2.08 CONVENTIONAL EXIT DEVICES

- A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:
1. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
 2. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.
 - a. Fire Exit Removable Mullions: Provide keyed removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions to be used only with exit devices for which they have been tested.
 3. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
 4. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is not acceptable except in any case where the door light extends behind the device as in a full glass configuration.
 5. Flush End Caps: Provide heavy weight impact resistant flush end caps made of architectural metal in the same finish as the devices as in the Hardware Sets. Plastic end caps will not be acceptable.
 6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with four threaded studs for thru-bolts.
 - a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets. Provided free-wheeling type trim where indicated.
 - b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Provide and install interior surface and concealed vertical rod exit devices as Less Bottom Rod (LBR) unless otherwise indicated.
 8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2 inches wide stiles.
 9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
 10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
 11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.
- B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 certified panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Mounting rails to be formed from smooth stainless steel, brass or bronze architectural materials no less than 0.072" thick, with push rails a minimum of 0.062" thickness. Painted or aluminum metal rails are not acceptable. Exit device latch to be investment cast stainless steel, pullman type, with deadlock feature.
1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
 - b. Sargent Manufacturing (SA) - 80 Series.
 - c. Yale Locks and Hardware (YA) - 7000 Series.

2.09 DOOR CLOSERS

- A. All door closers specified herein shall meet or exceed the following criteria:
1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
 2. Standards: Closers to comply with UL-10C and UBC 7-2 for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
 3. Cycle Testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
 4. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
 5. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
 - a. Where closers are indicated to have mechanical dead-stop, provide heavy duty arms and brackets with an integral positive stop.
 - b. Where closers are indicated to have mechanical hold open, provide heavy duty units with an additional built-in mechanical holder assembly designed to hold open against normal wind and traffic conditions. Holder to be manually selectable to on-off position.
 - c. Where closers are indicated to have a cushion-type stop, provide heavy duty arms and brackets with spring stop mechanism to cushion door when opened to maximum degree.
 - d. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics. Provide drop plates or other accessories as required for proper mounting.
 6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates, and through-bolt or security type fasteners as specified in the door Hardware Sets.

- B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.
 - 1. Acceptable Manufacturers:
 - a. Corbin Russwin Hardware (RU) - DC8000 Series.
 - b. Norton Door Controls (NO) – 9500 Series.
 - c. Sargent Manufacturing (SA) - 281 Series.

2.10 ARCHITECTURAL TRIM

- A. Door Protective Trim
 - 1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
 - 2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2 inches less than door width (LDW) on stop side of single doors and 1 inch LDW on stop side of pairs of doors, and not more than 1 inch less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
 - 3. Metal Protection Plates: ANSI/BHMA A156.6 certified metal protection plates (kick, armor, or mop), beveled on four edges (B4E), fabricated from the following:
 - a. Stainless Steel: 300 series, .050-inch thick, with countersunk screw holes (CSK).
 - 4. Fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets.
 - 5. Metal Door Edging: Door protection edging fabricated from a minimum .050-inch thick metal sheet, formed into an angle or "U" cap shapes, surface or mortised mounted onto edge of door. Provide appropriate leg overlap to account for protection plates as required. Height to be as specified in the Hardware Sets.
 - 6. Acceptable Manufacturers:
 - a. Burns Manufacturing (BU).
 - b. Rockwood Manufacturing (RO).
 - c. Trimco (TC).

2.11 DOOR STOPS AND HOLDERS

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

- C. Overhead Door Stops and Holders: ANSI/BHMA A156.6, Grade 1 certified overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.
 - 1. Acceptable Manufacturers:
 - a. Rixson Door Controls (RF).
 - b. Rockwood Manufacturing (RO).
 - c. Sargent Manufacturing (SA).

2.12 ARCHITECTURAL SEALS

- A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.
- B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.
 - 1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.
- C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.
 - 1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and UBC 7-2, Fire Tests of Door Assemblies.
- D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated, based on testing according to ASTM E 1408.
- E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.
- F. Acceptable Manufacturers:
 - 1. National Guard Products (NG).
 - 2. Pemko Manufacturing (PE).
 - 3. Reese Enterprises, Inc. (RS).

2.13 FABRICATION

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

2.14 FINISHES

- A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

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

3.03 INSTALLATION

- A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.
 - 1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.
- B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
 - 1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 2. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
 - 3. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.
- C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

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

3.04 FIELD QUALITY CONTROL

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

3.05 ADJUSTING

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

3.06 CLEANING AND PROTECTION

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

3.07 DEMONSTRATION

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

3.08 DOOR HARDWARE SCHEDULE

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

- B. Manufacturer's Abbreviations:

1. MK - McKinney
2. RO - Rockwood
3. SA - Sargent
4. RF - Rixson
5. NO - Norton
6. PE - Pemko

HARDWARE SCHEDULE

Set: 1.0

Doors: 103B, 104A

Description: EXT - UN-EQ PR

3 Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
3 Hinge	TA2314 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Mortise Exit Device	DG1 8913 ETL	US32D	SA
2 Surface Closer	CLP9500	689	NO
2 Flush Bolt	550	626	RO
1 Dust Proof Strike	570	626	RO
2 Kick Plate	K1050 8" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	467	Black	RO
1 Threshold	271A Pemkote MSES25SS		PE
1 Gasketing [Head]	2891APK		PE
1 Gasketing [Jamb]	290APK		PE

Set: 2.0

Doors: 121A, 121D

Description: EXT

3 Hinge (heavy weight)	T4A3386 NRP 4-1/2" x 4-1/2"	US32D	MK
1 Exit Device	DG1 8813 ETL	US32D	SA
1 Surface Closer	CLP9500	689	NO
1 Kick Plate	K1050 8" X 2" LDW 4BE CSK	US32D	RO
1 Door Stop	467	Black	RO
1 Threshold	271A Pemkote MSES25SS		PE
1 Gasketing [Head]	2891APK		PE
1 Gasketing [Jamb]	290APK		PE
1 Rain Guard	346C x LAR		PE
1 Sweep	3452AV		PE

Set: 3.0

Doors: 121C

Description: ASSEMBLY HALL - UN-EQ PR

3 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Mortise Exit Device	DG1 8913 ETL	US32D	SA
2 Flush Bolt	550	626	RO
1 Dust Proof Strike	570	626	RO
2 Surface Closer	9500	689	NO
2 Kick Plate	K1050 8" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	409 / 446 [as required]	US32D	RO
1 Gasketing	S773D		PE
1 Astragal Set	18061CNB		PE

Set: 4.0

Doors: 103A, 104B
Description: CORR UN-EQ PR

3 Hinge (heavy weight)	T4A3786 4-1/2" x 4-1/2"	US26D	MK
3 Hinge	TA2714 4-1/2" x 4-1/2"	US32D	MK
1 Exit Device	8913 ETL	US32D	SA
2 Flush Bolt	550	626	RO
1 Dust Proof Strike	570	626	RO
2 Surface Closer	CLP9500H	689	NO
2 Kick Plate	K1050 8" X 2" LDW 4BE CSK	US32D	RO
2 Door Stop	409 / 446 [as required]	US32D	RO
1 Gasketing	S773D		PE

Set: 5.0

Doors: 105A, 106A, 107A, 108A, 109A, 110A, 111A, 112A, 113A, 114A, 115A, 117A, 118A, 122A

Description: Replace existing door knob with ADA compliant lever lock to match locks as specified below. Provide appropriate type lock for use. Provide all components required to make change. Finish and manufacturer to match remainder of project. For openings with special security requirements (113A), coordinate with USARC and provide all components required for revision.

Set: 6.0

Not Used

Set: 7.0

Not Used

Set: 8.0

Doors: 120A
Description: STOR UN EQ

6 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
2 Flush Bolt	550	626	RO
1 Storeroom Lock	DG1 8204 LNL	US26D	SA
2 Surface Overhead Stop	10-X36	689	RF
2 Silencer	608		RO

Set: 9.0

Not Used

Set: 10.0

Doors: 116A, 119A
Description: OFFICE

3 Hinge	TA2714 4-1/2" x 4-1/2"	US26D	MK
1 Office Lock	DG1 8205 LNL	US26D	SA
1 Door Stop	409 / 446 [as required]	US32D	RO
1 Gasketing	S773D		PE

END OF SECTION

SECTION 08 80 00 GLAZING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Glass and glazing for doors and windows, interior and exterior locations.

1.02 RELATED SECTIONS

- A. Section 08 11 13 - Hollow Metal Doors and Frames.

1.03 QUALITY ASSURANCE

- A. 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.
- B. Prime Glass Standard: FS DD-G-45I.
- C. Heat-Treated Glass Standard: FS DD-G-I403.
- D. Safety Glass Standard: CPSC I6 CFR I20I.
- E. Fire rated glass: Underwriters Laboratories.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect glass during transit, storage and handling to prevent scratching or breakage of glass. Replace all broken or damaged glass at no additional cost to Owner.

1.05 PROJECT CONDITIONS

- A. Meet with Glazier and other trades affected by glass installation, prior to beginning of installation. Do not perform work under adverse weather or job conditions. Install liquid sealant when temperatures are within lower or middle third of temperature range recommended by manufacturer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Equivalent products by the following prime glass manufacturers are acceptable:

1. AFGD Glass, Inc., Atlanta, GA. Tel. (800) 766-2343.
2. American Glassmith, Inc. Columbus, OH. Tel No. (800) 870-2519.
3. Guardian Industries Corp., Carleton, MI. Tel. (800) 521-9040.
4. Pilkington North America, Toledo, OH. Tel. (419) 247-3731.
5. PPG Industries, Inc., Pittsburgh, PA. Tel. (800) 377-5267.
6. Technical Glass Products, Kirkland, WA. Tel. (800) 426-0279.
7. Viracon, Owatonna, MN Tel 800-533-2080
8. Zeledyne, Tulsa, OK. Tel. (800) 331-2607.

- B. Substitutions shall fully comply with specified requirements and Section 01 62 14 - Product Options and Substitution Procedures

2.02 INSULATING GLASS

- A. Material: Provide 1-5/16 inch VRE1-67 radiant low-E insulating Glass by Viracon or equal. Color to match existing window glazing. Shall consist of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E 774 for performance classification indicated. Use this type glass for all exterior applications, including doors.
- B. Provide tempered safety glass for panes where required by Code.
- C. Characteristics: Other requirements specified for glass characteristics, air space, sealing system, sealant spacer material, corner design and desiccant are as follows:
 - 1. Thickness of Interior Pane: 1/4 – inch clear - tempered
 - 2. Thickness of Exterior Pane: 1/4 – inch tempered - color to match existing
 - 3. Airspace Thickness: 1/2 - inch.
 - 4. Sealing System: Manufacturer's standard 1 inch sealing system.
 - 5. Spacer Material: Manufacturer's standard metal-white.
 - 6. Desiccant: Manufacturer's standard, either molecular sieve or silica gel.
 - 7. Corner Construction: Manufacturer's standard.
 - 8. Exterior Pane: Provide VRE Low-E coating on 2nd (air space) surface
 - 9. Interior Pane: Clear/clear.
 - 11. Warranty: Manufacturer's Ten year.

2.03 TEMPERED SAFETY GLASS

- A. Provide prime glass of color and type indicated, which has been heat treated to strengthen glass in bending to not less than 4.5 times annealed strength. Provide tempered glass produced by manufacturer's special process which eliminates tong marks.
- B. Provide clear 1/4 inch thick glass in interior doors where not required to be fire rated.

2.04 SETTING MATERIALS

- A. Provide all necessary primers, sealants, channels, setting blocks, etc. with items to be glazed. Conform to requirements set forth in FGJA Glazing Manual.

PART 3 - EXECUTION

3.01 GLAZING INSTALLATION

- A. Do not commence glazing Work until the required primers have been applied and have dried. Clean all surfaces to which setting materials are to be applied to assure that the materials properly adhere and seal.
- B. Experienced glaziers having highest quality workmanship shall perform all glazing. Glass shall be set without springing or forcing. Putty, glazing compound, stops and the like shall NOT project above the sight line. Exposed surfaces of putty and glazing compound shall be left straight, flat and clean. Corners shall be well formed.

- C. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- D. Apply clear glazing compound around perimeter and at all glass-to-glass connections of butt-glazing system. Compound shall be the type recommended by the glass manufacturer for this particular installation.

3.02 STANDARDS AND PERFORMANCE

- A. Watertight and airtight installation of each glass product is required, except as otherwise shown. Each installation must withstand normal temperature changes, wind loading, impact loading (for operating sash and doors), without failure including loss or breakage of glass, failure of sealant or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.
- B. Protect glass from edge damage during handling and installation, and subsequent operation of glazed components of the Work. During installation, discard units with significant edge damage or other imperfections.
- C. Glazing channel dimensions where shown are intended to provide for necessary bite on glass, minimum edge clearance, and adequate sealant thickness, with reasonable tolerances. Adjust as required by job conditions at time of installation.
- D. Comply with combined recommendations and technical reports by manufacturers of glass and glazing products as used in each glazing channel, and with recommendations of Flat Glass Marketing Association "Glazing Manual," except where more stringent requirements are indicated.

3.03 PREPARATION FOR GLAZING

- A. Clean glazing channel and other framing members to receive glass, immediately before glazing. Remove coatings that are not firmly bonded to substrate. Remove lacquer from metal surfaces where elastomeric sealants are used.
- B. Apply primer or sealant to joint surfaces where recommended by sealant manufacturer.

3.04 GLAZING

- A. Install setting blocks of proper size in sill rabbet, located 1/4 of glass width from each corner. Set blocks in thin course of heel-bead compound, if any.
- B. Provide spacers inside and out, of proper size and spacing, for glass sizes larger than 50 united inches, except where gaskets or pre-shimmed tapes are used for glazing. Provide 1/8 inch 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.
- C. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.
- D. Force sealant into channel to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

- E. Tool exposed surfaces of glazing liquids and compounds to provide a substantial "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of channel, so as to eliminate dirt and moisture pockets.
 - F. Clean and trim excess glazing materials from glass and stops or frames promptly after installation, and eliminate stains and discoloration.
 - G. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when installation is subjected to movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel-bead.
- 3.05 DOOR LITES
- A. Install glass in frames in sizes as shown on the Drawings and to comply with 2010 ADA.
- 3.06 CURE AND PROTECTION
- A. Protect glass from breakage immediately upon installation, by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces. Cure sealant for high early strength and durability.
 - B. Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.
- 3.06 CLEANING
- A. Wash and polish glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish Date of Completion in each area of Project. Comply with glass product manufacturer's recommendations for final cleaning.
 - B. The General Contractor shall be responsible for removal of protective materials and cleaning with plain water, or water with soap or household detergent as approved by the glass manufacturer. The General Contractor shall be held responsible for damages resulting from the use of other cleaning material.

END OF SECTION

SECTION 09 05 15 COLOR DESIGN

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. A coordinated comprehensive Color System in which requirements for materials specified in other Sections of this Specification and / or shown on the Drawings are identified for quality, color, finish, texture and pattern.

1.02 MANUFACTURER'S TRADE NAMES

- A. Manufacture's trade names and number designations used herein identify colors, finishes, textures and patterns for materials and products specified in the technical sections of the Specifications. Wherever such products are referred for selection or approval in other sections, such products shall be understood to be referenced to this Section. If no selection is listed herein for products, the Project Architect shall be contacted for a color selection. Subject to approval of the Project Architect, products of other manufacturers will be considered, provided they are equivalent to the quality, colors, finishes, textures and patterns listed and meet the requirements of the Specifications and Drawings.

1.03 RELATED SECTIONS

- A. Section 01 33 00 – Submittal Procedures.

1.04 SAMPLES

- A. At least three samples/sample sets shall be submitted for approval prior to applying or installing any finishes or items that are not included in this Section. One sample will be retained by the Engineer/Architect and two will be returned with the submittal so that one may be retained on site at all times. Upon receipt of samples, the Architect may make revisions to the Color schedule. Upon final color selection, a sample of the selected color and finish will be maintained on site and readily available upon demand. Returned office sample shall be protected for inclusion in the close out documents. See appropriate technical Sections for additional submittal requirements.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials are specified in other Sections of the Specifications. Any reference by trade name or manufacturer shall be considered as establishing a standard of quality and color range for selection and shall in no way limit competition.

2.02 MANUFACTURERS

- A. The following manufacturers were used in preparing the Color Schedule:

SECTION / MATERIAL	MANUFACTURER / NUMBER & COLOR NAME
04 20 00 – Brick	Use salvaged brick. Match existing where necessary.
04 20 00 – Mortar	Custom color to match existing.
04 20 00 – Weep Vents	CavClear - White

07 92 00 – Joint Sealants	Match adjacent lighter color
08 71 00 – Door Hardware	Match existing
09 51 00 – ACT Ceilings	Match existing
09 65 00 – Resilient Floor	VCT - Color to be selected
09 65 00 – Rubber Base and Edge Strips	RB - Color to be selected
09 90 00 – Paint – (General Upper Wall Paint)	P1 – To match existing light color of upper walls, Eggshell finish
09 90 00 – Paint – (General Lower Wall Paint)	P2 - Sherwin Williams SW 7713 "Tawny Tan," Eggshell finish
09 90 00 – Paint – (Interior Doors and Frames)	P1 – Gloss Finish
09 90 00 – Paint – (Exterior of HM doors/fFrames)	P3 – To be selected, Gloss finish
09 68 13 - Carpet Tile	Mannington, Centerfield IV, color to be selected
10 11 00 – Visual Display Board	All finishes to be selected when submitted.
10 14 00 - Signage	To be Selected
10 20 00 – Louvers	Custom Kynar color to be selected to match P3
11 31 15 – Appliances	White
12 21 16 – Rolling Blackout Shades	To be Selected
12 48 43 - Floor Mats	To be Selected

PART 3 - EXECUTION

3.01 EXECUTION

- A. Refer to execution requirements specified in other Sections of this Specification for the specific products listed. Any remaining colors, finishes, textures or patterns not included in this Color Design will be selected by the Architect upon written notification and subsequent submittals by the Contractor.

END OF SECTION

SECTION 09 29 00

GYPSUM BOARD

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Gypsum board work with a tape-and-compound joint treatment system known as "drywall finishing" work. The types of work required include the following:
 - 1. Gypsum board including screw-type metal support system.
 - 2. Gypsum board applied to metal framing and furring.
 - 3. Drywall finishing (joint tape-and-compound treatment)
 - 4. Sound control insulation.

1.02 SUBMITTALS

- A. Submit manufacturers technical product data, installation instructions and recommendations for products specified.

1.02 QUALITY ASSURANCE

- A. Where work is indicated for fire resistance ratings, including those required to comply with governing regulations, provide materials and installations identical with applicable assemblies which have been tested and listed by recognized authorities, including UL and A.I.A.
- B. Industry Standard: Comply with applicable requirements of GA-216 "Application and Finishing of Gypsum Board" by the Gypsum Association, except where more detailed or more stringent requirements are indicated including the recommendations of the manufacturer.
- C. Allowable Tolerances: 1/8 inch offsets between planes of board faces, and 1/4 inch in 8 ft. for plumb, level, warp and bow.
- D. Manufacturer: Obtain gypsum boards, framing and fasteners, trim accessories, adhesives and joint treatment products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum boards.

1.03 PRODUCT HANDLING

- A. Deliver gypsum drywall materials in sealed containers and bundles, fully identified with manufacturer's name, brand, type and grade; store in a dry, well ventilated space, protected from the weather, under cover and off the ground.

1.05 PROJECT CONDITIONS

- A. Installer must examine the substrates and the spaces to receive gypsum drywall, and the conditions under which gypsum drywall is to be installed; and shall notify the Contractor, in writing, of conditions detrimental to the proper and timely completion of the work. Do not proceed with the installation until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

- B. Maintain ambient temperatures at not less than 55 degrees F., for the period of 24 hours before drywall finishing, during installation and until compounds are dry.

PART 2 - PRODUCTS

2.01 METAL SUPPORT MATERIALS

- A. To the extent not otherwise indicated, comply with Gypsum Association Specification GA-203 "Installation of Screw-Type Steel Framing Members to Receive Gypsum board" (as specified and recommended) for metal system supporting gypsum drywall work.
- B. Interior Studs: ASTM C 645; 20 gage by 3-5/8 inches deep except as otherwise indicated or specified herein. Provide stud manufacturer's standard accessories such as clips, shoes, ties, reinforcements, fasteners and other accessories as needed for a complete stud system. Runners shall match studs; type recommended by stud manufacturer for floor and ceiling support of studs, and for vertical abutment of drywall work at other work. Provide double 20 gage studs at all openings and doorjamb and at door and opening headers.
- C. Furring Members: ASTM C 645; 20 gage, hat-shaped. Where shown as "Resilient", provide manufacturer's special type designed to reduce sound transmission.
- D. Fasteners: Type and size recommended by furring manufacturer for the substrate and application indicated.

2.02 GYPSUM BOARD PRODUCTS

- A. To the extent not otherwise indicated, comply with GA-216, as specified and recommended. Exposed gypsum board shall be Type X, fire rated type with tapered long edges and as follows:
 - 1. Edge Profile: Special rounded or beveled edge.
 - 2. Sheet Size: Maximum length available that will minimize end joints.
 - 3. Thickness: 5/8 inch, except where otherwise indicated.

2.03 TRIM ACCESSORIES

- A. Manufacturer's standard galvanized steel beaded units with flanges for concealment in joint compound including corner beads, edge trim and control joints; except provide semi-finishing type (flange not concealed) where indicated.
- B. Where metal moldings are specifically called out on the drawings, provide the appropriate item from below:
 - 1. Edge Trim - USG No. 200-A.
 - 2. Control Joint - USG No. 093.

2.04 JOINT TREATMENT MATERIALS

- A. General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.
- B. Joint Tape: Perforated type.

- C. Joint Compound: On interior work provide chemical hardening type for bedding and filling, ready-mixed vinyl-type or non-casein-type for topping. On exterior work provide water-resistant type.

2.05 MISCELLANEOUS MATERIALS

- A. Provide auxiliary materials for gypsum drywall work of the type and grade recommended by the manufacturer of the gypsum board. Gypsum board fasteners shall comply with GA-216. Provide anti-corrosive type at exterior applications.
- B. Sound Control Insulation, Interior Partitions: Provide QuietZone Acoustic Batts, unfaced sound attenuation batt insulation conforming to ASTM C 553, Type I, and ASTM C 665, Type I. Batts shall have surface burning characteristics of (10) for maximum flame spread and (10) for maximum smoke developed when tested in accordance with ASTM E 84. Batts shall be noncombustible when tested in accordance with ASTM E 136. Thickness of insulation shall be full thickness of stud cavity or as indicated on drawings.

PART 3 - EXECUTION

3.01 INSTALLATION OF METAL SUPPORT SYSTEMS

- A. To the extent not otherwise indicated, comply with GA-203, and manufacturer's instructions. Furnish concrete inserts, steel deck hanger clips, and similar devices to other trades for installation well in advance of time needed for coordination with other work. Isolate stud system from transfer to structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading. Install runner tracks at floors, ceiling and structural walls and columns where gypsum drywall stud system abuts other work. Terminate partition stud systems one foot above finished ceiling, braced each side at 45 degrees at 4 feet on center, except where indicated to be extended to structural support or substrate above. Space studs 16 inches on center except as otherwise indicated.
- B. Door Frames: Install additional jamb studs at door frames as indicated, but not less than 2 studs (minimum 20 gage) at each jamb. Space jack studs over doorframes at same spacing as partition studs, with bottom runner secured to doorframe.
- C. Install supplementary framing, runners, furring, blocking and bracing at opening and terminations in the work, and at locations required to support fixtures, equipment, services, heavy trim, furnishings and similar work which cannot be adequately supported directly on gypsum board alone.

3.02 GENERAL GYPSUM BOARD INSTALLATION REQUIREMENTS

- A. Meet at the project site with the installers of related work and review the coordination and sequencing of work to ensure that everything to be concealed by gypsum drywall has been accomplished, and that chases, access panels, openings, supplementary framing and blocking and similar provisions have been completed. In addition to compliance with GA-216 and ASTM C 840, comply with manufacturer's instructions and requirements for fire resistance ratings (if any), whichever is most stringent.
- B. Install sound attenuation blankets and insulation as indicated, prior to gypsum board unless readily installed after board has been installed.

- C. Install wall / partition boards vertically to avoid end- butt joints wherever possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs. Form control joints and expansion joints with space between edges of boards, prepared to receive trim accessories.
- D. Cover both faces of steel studs with gypsum board in concealed spaces (above ceilings, etc.), except in chase walls that are properly braced internally. Except where concealed application is required for sound, fire, air or smoke ratings, coverage may be accomplished with scraps of not less than eight (8) square foot area, and may be limited to not less than 75 percent of full coverage.
- E. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with J-type semi-finishing edge trim. Seal joints with acoustical sealant. Do not fasten drywall directly to stud system runner tracks.
- F. Floating construction: Where feasible, including where recommended by manufacturer, install gypsum board with "floating" internal corner construction, unless isolation of the intersecting boards is indicated or unless control or expansion joints are indicated.
- G. Space fasteners in gypsum boards in accordance with GA-216 and manufacturer's recommendations, except as otherwise indicated.

3.03 INSTALLATION OF DRYWALL TRIM ACCESSORIES

- A. Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges by nailing or stapling in accordance with manufacturer's instructions and recommendations.
- B. Install metal corner beads at all external corners of drywall work.
- C. Install metal edge trim whenever edge of gypsum board would otherwise be exposed or semi-exposed. Provide type with face flange to receive joint compound except where semi-finishing type is indicated. Install L-type trim where work is tightly abutted to other work, and install special kerf-type where other work is kerfed to receive long leg of L-type trim. Install U- type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints.) Install metal control joint (beaded type) where indicated or required for proper installation.

3.04 INSTALLATION OF DRYWALL FINISHING

- A. Apply treatment at gypsum board joints (both directions), flanges of trim accessories, penetrations, fasteners heads, surface defects and elsewhere as required to prepare work for decoration. Pre-fill open joints and rounded or beveled edges, using type of compound specified herein and recommended by manufacturer.
- B. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.
- C. Apply joint compound in 3 coats (not including pre-fill of openings in base), and sand between last 2 coats and after last coat.

- D. Unless otherwise indicated, install drywall finishing at all gypsum board exposed to view and to receive finishes, and where not exposed to view and above ceilings install at all fire rated and smoke, sound, air, conference, exam, toilet, private office, mechanical and electrical room walls.
- E. Finishing Gypsum Board Assemblies: Level 4 finish, unless otherwise indicated; Level 1 finish for concealed areas, unless a higher level of finish is required for fire-resistance-rated assemblies and Level 2 finish where panels form substrates for tile, Level 5 finish is required in areas with a gloss or epoxy finished coating.

3.05 PROTECTION OF WORK

- A. Installer shall advise Contractor of required procedures for protection of the gypsum drywall Work from damage and deterioration during the remainder of the construction period.

END OF SECTION

SECTION 09 51 00 ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Lay-in acoustical panels (2'-0" by 2'-0" Grids) for metal ceiling suspension systems.
- B. Suspended metal grid system complete with wall trim.

1.02 SUBMITTALS

- A. Manufacturer's product specifications, samples, and installation instructions for each acoustical ceiling material required, and for each suspension system, including certified laboratory test reports and other data as required to show compliance with these specifications. Include manufacturer's recommendations for cleaning and refinishing acoustical units, including precautions against materials and methods that may be detrimental to finishes and acoustical performances.

1.03 QUALITY ASSURANCE

- A. Installer shall be a company with not less than 3 years of documented successful experience in installation of acoustical ceilings similar to requirements for this Project and acceptable to manufacturer of acoustical units, as shown by current written statement from manufacturer (required for approval).

1.04 PROJECT CONDITIONS

- A. Do not install interior acoustical ceilings until the following conditions are met:
 - 1. Space is enclosed and weatherproof.
 - 2. Wet work in space completed and nominally dry.
 - 3. Work above ceilings is completed.
 - 4. Ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.
- B. Maintain a light level of a minimum of 50 fc during entire installation.

1.05 PROJECT COORDINATION

- A. It shall be this contractor's responsibility to coordinate with mechanical and electrical trades with respect to their requirements for additional suspension system components. Any additional components required shall be furnished and installed by this contractor.

1.06 MAINTENANCE STOCK

- A. At time of completing installation, deliver stock of maintenance material to Owner. Furnish full size units matching units installed, packaged with protective covering for storage, and identified with appropriate labels. Furnish amount equal to ten acoustical tile units in original box.

PART 2 - PRODUCTS

2.01 ACOUSTICAL PANELS

- A. Provide manufacturer's standard lay-in panels of type recommended by manufacturer for application indicated. Provide 2'-0" by 2'-0" grid-size panels, with white washable finish.
- B. Mineral Fiber Acoustical Tile: Provide units to match existing recently installed ceilings exactly. Substitutions not accepted.

2.02 CEILING SUSPENSION MATERIALS

- A. Comply with ASTM C 635, as applicable to type of suspension system required for type of ceiling units indicated. Coordinate with other work supported by or penetrating through ceilings, including light fixtures, HVAC equipment, and partition system (if any). Structural Class of the system shall be intermediate-duty.
- B. Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table I, Direct Hung.
 - 1. Hanger Wires: Galvanized carbon steel, ASTM A 641, soft temper pre-stretched, yield-stress load of at least 3 times design load, but not less than 12 gage (0.106 inch).
 - 2. Type of System: Either direct or indirect-hung suspension system, at Contractor's option.
 - 3. System Manufacturer: To match recently installed system exactly.
- C. Edge Moldings: Manufacturer's standard channel molding for edges and penetrations of ceiling, with single flange of molding exposed, white baked enamel finish unless otherwise indicated.
- D. Exposed Suspension System: Manufacturer's standard exposed runners, cross-runners and accessories, or types and profiles indicated, with exposed cross runners coped to lay flush with main runners. Provide uniform factory-applied finish on exposed surfaces of ceiling suspension system, including moldings, trim, and accessories. Use manufacturer's standard baked enamel finish, white.

2.03 MISCELLANEOUS MATERIALS

- A. Edge Trim Molding: Metal or extruded PVC plastic, of types and profiles indicated, white finish unless otherwise indicated.
- B. Hold-Down Clips: Where required for wind uplift resistance or fire-resistance rating, provide standard spring steel clips, except provide accessible type at locations indicated on drawings.

PART 3 - EXECUTION

3.01 COORDINATION

- A. Mechanical and electrical work above suspended ceiling shall be strictly coordinated with the work in this Section.

3.02 EXAMINATION

- A. Installer must examine conditions under which acoustical ceiling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.03 PREPARATION

- A. Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

3.04 INSTALLATION

- A. Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire resistance rating requirements as indicated, and industry standards applicable to the Work.
- B. Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers near each end and spaced 4 feet along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8 inch in 12 feet. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.
- C. Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units. Screw-attach moldings to substrate at intervals not over 16 inches on center and not more than 3 inches from ends, leveling with ceiling suspension system to tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
- D. Install acoustical panels in coordination with suspension system, with edges concealed by support of suspension members. Scribe and cut panels to fit accurately at borders and at penetrations. Install hold-down clips in areas indicated, and in areas where required by governing regulations or for fire-resistance ratings; space as recommended by panel manufacturer, unless otherwise indicated or required.

3.05 ADJUSTING AND CLEANING

- A. Adjust sags or twists which develop in the ceiling system and replace parts that are damaged or faulty.
- B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 65 00 RESILIENT FLOORING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Vinyl Composition Tile (V.C.T.) Flooring, Vinyl Base, and Accessories.

1.02 RELATED SECTIONS

- A. Section 09 05 15 – Color Design.

1.03 SUBMITTALS

- A. Submit manufacturer's product data and written instructions for recommended installation and maintenance practices for each type of resilient flooring and accessories.
- B. Submit complete line of color samples for selection.

1.04 QUALITY ASSURANCE

- A. Wherever possible, provide resilient flooring, adhesives, cleaners, polishes and accessories produced by a single manufacturer.
- B. Secure the service of an experienced, professional floor service to provide necessary equipment and manpower to complete the Work.

1.05 PROJECT CONDITIONS

- A. Continuously heat areas to receive flooring to 70 degrees F. for at least 48 hours prior to installation, when project conditions are such that heating is required. Maintain 70 degrees F. temperature continuously during and after installation as recommended by flooring manufacturer but not less than 48 hours. Maintain a minimum lighting level of 50 fc during installation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by Armstrong Commercial Flooring, 877-276-7876.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Mannington Commercial Flooring, Calhoun, GA. Tel. No. (800) 241-2262.
 - 2. Armstrong Commercial Flooring, Lancaster, PA. Tel. No. (800) 292-6308.
 - 3. Azrock Commercial Flooring, Florence, AL. Tel. No. (800) 558-2240.
 - 4. Johnsonite, Chagrin Falls, OH. Tel. No. (800) 899-8916.
- C. Alternate manufacturers: Products produced by other manufacturers that fully meet or exceed the specified requirements may be considered under provisions of Section 01 25 00 Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 TILE FLOORING

- A. Vinyl Composition Tile (VCT): Imperial Texture Standard Excelon, as manufactured by Armstrong Commercial Flooring.
- B. Static Dissipative Tile (SDT): Static Dissipative Vinyl Composition Tile Excelon SDT by Armstrong Commercial Flooring.
- C. Size: 12 inches by 12 inches.
- C. Thickness: 1/8 inch gage.
- D. Color: Color to be selected by Project Engineer / MDOT Architect from manufacturer's full range of Premium colors.

2.03 ACCESSORIES

- A. Provide rubber base complying with ASTM F-1861, Type TP, Group 1 (solid) Standard Specification for Resilient Wall Base, with matching end stops and preformed or molded corner units. Base shall be 4 inches high, 0.125 inch gage, length 120 feet, standard top-set cove.
- B. Resilient Edge Strips: 1/8-inch thick, homogenous vinyl of rubber composition, tapered or bullnose edge, color to match flooring, or as selected by MDOT Architect from standard colors available; not less than 1 inch wide.
- C. Carpet Edge Guard, Nonmetallic: Extruded or molded rubber carpet edge guard for carpet to VCT transitions, manufactured by rubber base manufacturer. Color to match rubber base material.
- D. Adhesives (Cements): As recommended by flooring manufacturer to suit material and substrate conditions. Tile to be installed over existing tile.
- E. Static Dissipative Tile Adhesive: As recommended by flooring manufacturer under SDT installation.
- F. Primer: Non-staining type as recommended by flooring manufacturer.
- G. Leveling Compound: As recommended by flooring manufacturer.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Installer shall examine the areas and conditions under which resilient flooring and accessories are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 PREPARATION

- A. Acclimate tile and base to job site conditions for at least 48 hours prior to installation. Prior to laying flooring, broom clean or vacuum surfaces to be covered and inspect

subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed Work.

- B. Existing VCT flooring to remain under installation.
- C. Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions in existing floor. Apply primers if recommended by flooring manufacturer prior to application of adhesive.
- D. Perform moisture tests on concrete slabs and leveling compound to determine that concrete surfaces are sufficiently cured and ready to receive flooring. Apply primer, if recommended by flooring manufacturer, prior to application of adhesive.

3.03 INSTALLATION

- A. Install flooring after finishing operations, including painting, have been completed and permanent-heating system is operating. Moisture content of concrete slabs, building air temperature and relative humidity must be within limits recommended by flooring manufacturer.
- B. Place flooring with adhesive cement in strict compliance with manufacturer's recommendations. Butt tightly to vertical surfaces, thresholds, nosings and edgings. Scribe around obstructions to produce neat joints, laid tight, even, and straight. Extend flooring into toe spaces, door reveals, and into closets and similar openings.
- C. Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.
 - 1. Install flooring on covers for telephone and electrical ducts, and other such items as occur within finished floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed in these covers.
 - 2. Tightly cement edges to perimeter of floor around corners and to corners. Tightly cement flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.
- D. Tile Flooring: Lay tile from center marks established with principal walls, discounting minor off-sets, so that tile at opposite edges of the room are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at room perimeters. Lay tile square to room axis, unless otherwise shown. Match tiles for color and pattern by using tile from cartons in the same sequence as manufactured and packaged. Cut tile neatly to and around all fixtures. Broken, cracked, chipped or deformed tiles are not acceptable.
 - 1. Tightly cement tile to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks through tile, or other surface imperfections.
 - 2. Lay tile with grain in all tiles running in the same direction.
- E. Accessories: Apply resilient base to walls, columns, pilaster, casework and other permanent fixtures in rooms or areas where base is required. Install base in as long lengths as practicable (continuous between openings and wall to wall), with preformed corner units. Tightly bond base to backing throughout the length of each piece, with continuous contact at horizontal and vertical surfaces. Place resilient edge strips tightly butted to flooring and secure with adhesive. Install edging strips at all unprotected edges of flooring, unless otherwise shown. Comply with manufacturer's written instructions for installing resilient base.

3.04 PATTERN

- A. Tile shall be centered such that no less than half a tile shall be along any edge and joints shall align with adjacent colors.

3.05 CLEANING AND PROTECTION

- A. Initial Cleaning: Remove excess adhesive or other surface blemishes, using neutral type cleaners as recommended by flooring manufacturer.
- B. Follow cleaning and protection instructions for Static Dissipative Tile per manufacturer.
- C. Maintenance Immediately After Installation:
 - 1. Do not wash or scrub the floor for 5 days after installation to allow the floor tiles to bond to the underlayment / subfloor.
 - 2. Keep heavy furniture and equipment off the floor at least 48 hours to allow the adhesive to set.
 - 3. Sweep or vacuum thoroughly, and remove residual adhesive with a clean white cloth dampened with cleaners as recommended by flooring manufacturer.
 - 4. Apply 3 coats of manufacturers recommended high-quality cross-linked acrylic floor polish, allowing 60 minutes drying time between applications.
- D. Protection: Protect installed flooring from damage by covering with floor protection paper.
- E. Finishing: After completion of project and just prior to final inspection of Work, scrub the floor using a good quality non-alkaline cleaner and a floor machine of 170-250 rpm equipped with a green or blue scrubbing pad.
 - 1. Thoroughly rinse the floor (avoid flooding the floor) and allow the floor to dry completely.
 - 2. Apply 3 coats of manufacturers recommended high-quality, cross-linked acrylic floor polish, allowing 60 minutes between applications.
 - 3. After polish is completely dry, spray buff using a diluted (7 - 8 percent solids) floor polish. Before the liquid is dry, buff with a floor machine equipped with a white or tan buffing pad or a soft brush at 170-700 rpm. Buff until the liquid is dry and a thin glossy film remains.
 - 4. Protect completed Work from traffic and damage until acceptance by the Owner.

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. The extent of each type of carpeting is indicated on the Drawings, and includes carpet and accessories. Each type of required carpet is specified by data sheets, included as last pages of this section.

1.02 SUBMITTALS

- A. Submit manufacturer's technical data to show compliance with requirements. Include laboratory test reports and manufacturer's certifications and installation/maintenance instructions and recommendations. Submit additional copy of all submittals to installer.
- B. Test Certifications: Submit independent test reports that products specified comply with the ratings specified in Paragraph 1.03, Quality Assurance and the following:
 1. Critical Radiant Flux of Floor Covering Systems test rating in accordance with N.F.P.A. Standard No. 253 - 1984 and ASTM E 648.
 2. Flammability of Floor Covering Materials in accordance with C.P.S.C. FF 1 70 or ASTM D 2859.
 3. Smoke Density Test of Materials in accordance with N.F.P.A. Standard No. 258 or ASTM E 662.
- C. Submit four samples of each carpet required, and 6" lengths of exposed edge stripping.
- D. Submit installer's qualifications and experience record.

1.03 QUALITY ASSURANCE

- A. Installer must be a firm with not less than 5 years of carpeting experience, similar to work of this section. Manufacturer must be a firm with not less than 5 years of production experience with carpet similar to types specified in this section; and whose published product literature clearly indicates compliance of product with requirements of this section. Installer shall be approved by the manufacturer of the carpet specified. Installation shall be under direct observation of an experienced supervisor thoroughly familiar in this type of work. Mechanics executing this work shall also be qualified and experienced in all facets of the work performed.
- B. General Standard: Comply with recommendations of "Carpet Specifiers Handbook" by The Carpet and Rug Institute, which can be reasonably applied to types of carpeting required.
- C. Product Performance Testing; Flame/Smoke Resistance:
 1. National Flammability Std. CPSSD FF1 70 or ASTM D 2859 (Methenamine Pill Test). Result: Pass (Self Extinguishing).
 2. Radiant Panel Test ASTM E 648: For burning under varying radiant energy levels. Result: Class 1, greater than .45 watts/sq./cm.
 3. Smoke density test NFPA 258 and ASTM E 662 for measuring optical density of smoke generated in a radiant heat chamber, with and without flame. Result: Pass (Less than 450 smoke develop limit).

1.04 REPLACEMENT MATERIALS AND EXTRA STOCK

- A. After completion of work, deliver to the project site not less than a minimum of 5 percent of carpet of each type, color, and pattern of carpet and carpet accessories specified and installed. Furnish replacement materials from the same manufactured sequence as the materials installed, in protective wrapping and properly labeled and identified.
- B. Deliver extra materials to Owner in accordance with Section – Closeout Procedures.

1.05 PRODUCT DELIVERY AND STORAGE

- A. Deliver carpeting materials in protective wrapping, and store inside, protected from weather, moisture and soiling.

1.06 WARRANTY

- A. Provide special warranty, signed by Contractor, Installer and Manufacturer (Carpet Mill), agreeing to repair or replace defective materials and workmanship of carpeting work during 1-year warranty period following acceptance. Attach copies of product warranties.

PART 2 - PRODUCTS

2.01 TILE CARPET

- A. Data Sheets/Schedule: Each required type of carpet is specified by either carpet data sheet at end of this section or carpet schedule on Drawings, to the extent not specified by provisions of this section.
- B. Carpet Fiber (Filament): Refer to carpet data sheet/schedules for selection of fiber or fiber blend required for each type of carpet.
- C. Carpet Face Yarn: Except as otherwise indicated or designated by data sheet, fabricate carpet from yarns to denier (weight), plies and twist recommended by manufacturer to achieve the colors, patterns and textures indicated.
- D. Carpet Color, Pattern, Texture: Unless otherwise indicated or shown on data sheets, match Architect's sample(s) or match manufacturer's stock carpet(s) as designated for control/selection of color, pattern and texture.
- E. Carpet Construction: Fabricate carpet by the construction method indicated or shown on data sheets, as recognized in the carpet industry, using manufacturer's (mill's) standard process.
 - 1. Pile Density Factory Weight (Weight Basis): Tufts per sq. in. (double yarns) multiplied by yarn denier; as indicated.
 - 2. Pile Thickness (Height): Average height above backing, ASTM D 418; as indicated.
 - 3. Pile Face Weight: Oz. per Sq. Yd. above backing, as indicated.
 - 4. Gage or Pitch: Gage is spacing of tufts and pitch is number of tufts in 27", measured at each row of tufts in width of carpet; as indicated.
 - 5. Unitary Backing: Except as otherwise indicated, provide carpet manufacturer's standard type and weight of backing materials, as recommended for adequate strength and carpet stability without application of secondary sheet-type backing, and as appropriate for service and exposure indicated.
 - 6. Primary Backing: Except as otherwise indicated, provide construction of natural or synthetic fibers or non-woven sheets, as applicable to the carpet construction indicated, and appropriate for the service and exposures indicated.

7. Back Coating: Liquid latex coating or manufacturer's similar equivalent coating as required for carpet stability and tuft bind as indicated. Unless otherwise indicated, provide tuft bind of not less than 8 lbs. for looped pile and 6 lbs. for cut pile, ASTM D 1335.
8. Tufted Carpet: Provide coating weight of not less than 15 oz. per sq. yd.
9. Secondary Backing: Provide 8.0 oz. per sq. yd. woven jute carpet backing. Laminate to primary backing with latex or similar adhesive recommended by manufacturer; provide a bond strength of 2 lbs. per in., FS DDD-C-0095.
10. Carpet Flammability: Provide carpet which passes the flammability test of ASTM D 2859 (DOC FF-1-70), Pill Test.

2.03 CARPET ACCESSORIES

- A. Carpet Edge Guard, Nonmetallic: Refer to 09 65 00 Resilient Flooring.
- B. Installation Adhesive: Water resistant type as recommended by carpet manufacturer, and which complies with flammability requirements for installed carpet. Where carpet is to be installed over existing tile, provide primer as recommended by carpet manufacturer.
- C. Seaming Cement: Hot-melt seaming adhesive or similar product recommended by carpet manufacturer, for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.
- D. Miscellaneous Materials: As recommended by manufacturers of carpet and other carpeting products; and selected by installer to meet project circumstances and requirements.

PART 3 - EXECUTION

3.01 PRE-INSTALLATION REQUIREMENTS:

- A. Installer must examine substrates for moisture content and other conditions under which carpeting is to be installed, and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed until unsatisfactory conditions have been corrected. Contractor and installer shall be responsible for providing necessary moisture tests on substrate. If substrate is not within acceptable manufacturers tolerances, provide necessary temperature and humidity controls, sealants and coatings, special backings, etc. as required to allow carpeting to be installed in accordance with manufacturers specifications and requirements.
- B. Clear away debris, remove stains and spills and scrape up cementitious deposits from surfaces to receive carpeting; vacuum clean immediately before installation. Check concrete surfaces to ensure no "dusting" through installed carpet; apply sealer where required to prevent dusting.
- C. Sequence carpeting with other work so as to minimize the possibility of damage and soiling of carpet during the remainder of the construction period.

3.02 INSTALLATION

- A. Comply with manufacturers' instructions and recommendations for seam locations and direction of carpet; maintain uniformity of direction and lay of pile. At doors, center seams under doors; do not seam in traffic direction at doorways. Extend carpet under open-bottomed obstructions and under removable flanges and furnishings and into alcoves and closets of each space.
- B. Provide cut-outs where required, and bind cut edges properly where not concealed by protective edge guards or overlapping flanges. Install carpet edge guard where edge of carpet is exposed; anchor guards to substrate.

- C. Install carpet by trimming edges, buttering cuts with seaming cement, taping or sewing or taping-and-sewing seams to provide sufficient strength for stretching and continued stresses during life of carpet. Apply seaming cement over stitching on backing, if not covered by tape.
- D. Stretch carpet both directions, the exact amount recommended by carpet manufacturer; trim edges, secure to stripping, and conceal behind edge of stripping. Use power stretchers where sufficient space is available to operate stretchers properly.
- E. Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions in existing floor where installed over existing VCT. Apply primers if recommended by flooring manufacturer prior to application of adhesive.

3.03 CLEANING AND PROTECTION

- A. Remove debris, sorting pieces to be saved from scraps to be disposed of. Vacuum carpet using commercial machine with face-beater element. Remove spots and replace carpet where spots cannot be removed.
- B. Advise Contractor of protection methods and materials needed to ensure that carpeting will be without deterioration or damage at time of acceptance.
- C. Restretching: Return to installation after approximately 6 months of occupancy and use; restretch carpet in each space, repair faults in seaming, trim and adjust carpeting at edges.

3.04 The individual carpet data sheets as follows:

CARPET NO. 1 DATA SHEET

Manufacturer:	Mannington
Style name	Centerfield IV - 20
Construction	Tufted Texture-Twist Loop
Face Fiber	Invista Antron Lumena Type 6,6 Four Hole, Hollow Filament Nylon, with permanent stain and bleach protection, static control, and Duratech soil resistant treatment, and a fiber modification ratio of <1.5
Dye Method	Solution dyed
Gauge	1/10
Stitches per inch	6.33
Pile Thickness	0.102 inches
Tufted Yarn Weight	20 ounces per square yard
Density	Average Density: 7,058; Weight Density: 141,176
Primary Backing	100% synthetic
Secondary Backing	Infinity Modular Reinforced Composite Closed Cell Polymer
Size:	24 inches by 24 inches
Installation Method:	Monolithic
Warranty	Lifetime Limited Warranty, including face wear, moisture barrier, delamination, tuft bind, unraveling, and static protection
Bleach Resistant Warranty	ColorSafe with 15 year Limited Warranty against color loss from bleach spills
Stain Resistant Warranty	XGUARD with 15 Year Limited Warranty against staining
Adhesive Bond Warranty	Mannington Infinity Pressure Sensitive Adhesive: Limited Lifetime Warranty

CARPET NO. 2 DATA SHEET

Manufacturer:	Lees Carpet (Modular Tile)
Type:	First Step L8513, Tuff Stuff Collection
Construction:	Tufted
Surface Texture:	Performance Loop Pile
Gauge	5/32"
Stitches	8.5 per inch
Finish Pile Thickness	0.249" avg
Face Yarn	Fortis Nylon
Dye System	Yarn Dyed
Fiber Technology	Sentry Soil Protection
Face Yarn Weight	38 oz/yd ²
Backing Materials	EcoFlexICT
Weight Density	208,772
Size	24 inches by 24 inches
Foot Traffic Recommendation	Severe
Static	Less than 2.5KV when tested under the Standard Shuffle Test 70 degrees Fahrenheit – 20 percent R.H.
Flammability	Passes DOC-FF-1-70 Pill Test
Flooring Radiant Panel Test	Meets NFPA Class 1 when tested under ASTM E-648 glue down
Smoke Density	NBS Smoke Chamber NFPA-258 - Less than 450 Flaming Mode
Warranties	
Wear	Lifetime of carpet, non-prorated. No more than 10 percent face yarn loss by weight in normal use.
Static	Lifetime of carpet, non-prorated.
Edge Ravel	Lifetime of carpet, non-prorated. Guaranteed no edge ravel in normal use and no seam sealers required.
Delamination	Lifetime of carpet, non-prorated.
Tuft Bind	Lifetime of carpet, non-prorated. Guaranteed not to zipper, wet or dry
Adhesive	Use of Lees adhesives will bond the carpet to the substrate for the life of the carpet.

END OF SECTION

SECTION 09 90 00

PAINTS AND COATINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Painting and finishing of exterior and interior exposed items and surfaces throughout the project, except as otherwise indicated. Surface preparation, priming and finish coats specified in this Section are in addition to shop priming and surface treatment specified under other Sections of the Work.
 - 1. "Paint" means all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.
 - 2. Paint all exposed surfaces whether or not colors are designated in "schedules", except where the natural finish of the material is specifically noted as a surface not to be painted. Where items or surfaces are not specifically mentioned, paint these the same as adjacent similar materials or areas. If color or finish is not designated, the Architect will select these from standard colors available for the materials system specified.
- B. Related Sections: Section 09 05 15 – Color Design.

1.02 PAINTING NOT INCLUDED

- A. The following categories of Work are not included as parts of the field-applied finish Work, or are included in other Sections of these Specifications.
- B. Shop Priming: Ferrous metal items shall be shop primed. Also, fabricated or factory-built mechanical and electrical equipment or accessories.
- C. Pre-Finished Items: Unless otherwise indicated, do not include painting when factory-finishing or installer finishing is specified for such items as (but not limited to) prefinished partition systems, acoustic materials, finished mechanical and electrical equipment including light fixture, switch-gear and distribution cabinet.
- D. Concealed Surfaces: Unless otherwise indicated, painting is not required on surfaces such as walls or ceilings in concealed areas and generally inaccessible areas, foundations spaced, furred areas, utility tunnels, pipe spaces, and duct shafts.
- E. Finished Metal surfaces: Metal surfaces of anodized aluminum, stainless steel, chromium plate, copper, bronze and similar finished materials will not require finish painting, unless otherwise indicated.
- F. Operating Parts and Labels: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sinkages, sensing devices, motor and fan shafts will not require finish painting, unless otherwise indicated. Do not paint over any code-required labels, such as Underwriter's Laboratories and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information including basic materials analysis and application instructions for each coating material specified.

- B. Samples for Initial Selection: For each type of topcoat product indicated. Submit color samples for selection by Architect from manufacturer's full range of colors. Indicate submitted manufacturer's closest STANDARD colors that match colors specified or provide "Custom" color if not match.
- C. Product List: For each product indicated, include the following:
 - 1. Comply with Articles 3.7 and 3.8 indicating each type of primer, intermediate coat and topcoat required for each substrate by product name and number.
 - 2. Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules.
- D. Coating Maintenance Manual: Upon conclusion of the project, the Contractor or paint manufacturer / supplier shall furnish a coating maintenance manual, such as Sherwin-Williams "Custodian Project Color and Product Information" report or equal. Manual shall include an Area Summary with finish schedule, Area Detail designating where each product / color / finish was used, product data pages, Material Safety Data sheets (MSDS), care and cleaning instructions, including touch-up procedures.
- E. Substitutions for Convenience: Architect will consider formal written requests from Contractor for substitution of products in place of those specified if received within 30 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect. Substitutions which decrease the film thickness, the number of coats applied, change the generic type of coating or fail to meet the performance criteria of the specified materials WILL NOT be approved. All primers and topcoats plus the seam sealer and pit filler shall be furnished by the same manufacturer to ensure compatibility.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label, and the following information:
 - 1. Name or title of material.
 - 2. Fed. Spec. Number, if applicable.
 - 3. Manufacturer's stock number and date of manufacturer.
 - 4. Manufacturer's name.
 - 5. Contents by volume, for major pigment and vehicle constituents.
 - 6. Thinning instructions.
 - 7. Application instructions.
 - 8. Color name and number.
- B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.
 - 1. Maintain containers in clean condition, free of foreign materials and residue.
 - 2. Remove rags and waste from storage areas daily.

1.05 PROJECT CONDITIONS

- A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

- B. Do not apply paint in snow, rain, fog or mist; or when the relative humidity exceeds 85 percent; or to damp or wet surfaces; unless otherwise permitted by the paint manufacturer's printed instruction. Painting may be continued during inclement weather only if the areas and surfaces to be painted are enclosed and heated within the temperature limits specified by the paint manufacturer during application and drying periods.

1.06 EXTRA MATERIALS

- A. Furnish extra materials described below that are from same production run (batch mix) as materials applied and that are packaged for storage and identified with labels describing contents.
 - 1. Quantity: Furnish an additional 5 percent, but not less than 1 gallon of each material and color applied.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Benjamin Moore & Company, Montvale, NJ. Tel. (800) 344-0400.
 - 2. Farrell-Calhoun Paint, Memphis, TN. Tel. (901) 526-2211.
 - 3. PPG Paints, Inc., Pittsburgh, PA. Tel (412) 434-3131.
 - 4. Rust-Oleum, Vernon Hills, IL. 60061. Tel. (800) 323-3584.
 - 5. Sherwin-Williams Company, Cleveland, OH 44115. Tel. (800) 321-8194.
- B. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 COLORS AND FINISHES

- A. Paint colors, surface treatments, and finishes will be selected from color chips submitted by contractor. Prior to beginning Work, the Architect will select color chips for surfaces to be painted. Use representative colors when preparing samples for review. Final acceptance of colors will be from samples.
- B. Colors Pigments: Pure, non-fading, applicable types to suit the substrates and service indicated. Lead content in the pigment, if any, is limited to contain not more than 0.5 percent lead, as lead metal based on the total non-volatile (dry-film) of the paint by weight.
- C. Paint Coordination: Provide finish coats which are compatible with prime paints used. Review other sections of these Specifications in which prime paints are to be provided to ensure compatibility of total coats system for various substrates. Upon request from other trades, furnish information on characteristics of finish materials provided for use, to ensure compatible prime coats are used. Provide barrier coats over incompatible primer or remove and reprime as required. Notify the Architect in writing of any anticipated problems using specified coating systems with substrates primed by others.

2.03 MATERIAL QUALITY

- A. Provide the best quality grade of the various types of coatings as regularly manufactured by acceptable paint materials manufacturers. Materials not displaying the manufacturer's identification as a standard, BEST GRADE product WILL NOT be acceptable. Proprietary names used to designate colors or materials are not intended to imply that products of the named manufacturers are required to the exclusion of equivalent products of other manufacturers.
- B. Provide undercoat paint produced by the same manufacturer as the finish coats. Use only thinners approved by the paint manufacturer, and use only within recommended limits.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Applicator must examine the areas and conditions under which painting Work is to be applied and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator. Starting of painting Work will be construed as the Applicator's acceptance of the surfaces and conditions within any particular area.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Masonry (Clay and CMU): 12 percent.
 - 3. Wood: 15 percent.
 - 4. Plaster: 12 percent.
 - 5. Gypsum Board: 12 percent.
- C. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions otherwise detrimental to the formation of a durable paint film.

3.02 SURFACE PREPARATION

- A. Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition.
 - 1. Remove all hardware, hardware accessories, machined surfaces, plates, lighting fixtures, and similar items in place and not to be finish-painted, or provide surface-applied protection prior to surface preparation and painting operations.
 - 2. Remove, if necessary, for the complete painting of the items and adjacent surfaces.
 - 3. Following completion of painting of each space or area, re-install the removed items by workmen skilled in the trades involved.
 - 4. Clean surfaces to be painted before applying paint or surface treatments.
 - 5. Remove oil and grease prior to mechanical cleaning.
 - 6. Schedule the cleaning and painting so that contaminants from the cleaning process with not fall onto wet, newly painted surfaces.

B. Ferrous Metals:

1. Clean ferrous surfaces, which are not galvanized or shop-coated, of oil, grease, dirt, loose mill scale and other foreign substances by solvent or mechanical cleaning.
2. Touch-up shop-applied prime coats wherever damaged or bare. Where required by other Sections of these Specifications, clean and touch-up with the same type shop primer.

C. Galvanized Surfaces: Clean free of oil and surface contaminants with acceptable non-petroleum based solvent.

3.03 MATERIALS PREPARATION

- A. Mix and prepare painting materials in accordance with manufacturer's directions. Store materials not in actual use in tightly covered containers. Maintain containers used in storage, mixing and application of paint in a clean condition, free of foreign materials and residue. Stir materials before application to produce a mixture of uniform density, and stir as required during the application of the materials. Do not stir surface film into the material. Remove the film and if necessary, strain the material before using.

3.04 APPLICATION

- A. Apply paint in accordance with the manufacturer's directions. Use applications and techniques best suited for the substrate and type of material being applied. Apply additional coats when undercoats, stains or other conditions show through the final coat of paint, until the paint film is of uniform finish, color and appearance. Give special attention to insure that all surfaces, including edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
- B. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before final installation of equipment. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, non-specular black paint. Paint the back-sides of access panels, and removable or hinged covers to match the exposed surfaces.
- C. Finish exterior doors on tops, bottoms and side edges the same as the exterior faces, unless otherwise indicated.
- D. Sand lightly between each succeeding enamel or varnish coat.
- E. Omit the first coat (primer) on metal surfaces that have been shop-primed and touch-up painted, unless otherwise indicated or barrier coat is required for compatibility.
- F. Scheduling Paint: Apply the first-coat material to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration. Allow sufficient time between successive coatings to permit proper drying. Do not re-coat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure and the application of another coat of paint does not cause lifting or loss of adhesion of the undercoat.
- G. Minimum Coating Thickness: Apply each material at not less than the manufacturer's recommended spreading rate, to establish a total dry film thickness as indicated or, if not indicated, as recommended by coating manufacturer.

- H. Mechanical and Electrical Work: Painting of mechanical and electrical Work include items exposed to view in mechanical equipment rooms, in occupied spaces and where indicated on Drawings or specified in other Sections. Coordinate with Mechanical, Plumbing and Electrical Sections.
 - 1. Mechanical items to be painted include, but are not limited to, the following:
 - a. Piping, pipe hangers, and supports.
 - b. Heat exchangers.
 - c. Tanks.
 - d. Ductwork.
 - e. Motor, mechanical equipment and supports.
 - f. Accessory items.
 - 2. Electrical items to be painted include, but are not limited to, the following:
 - a. Conduit and fittings.
 - b. Switchgear.
- I. Prime Coats: Apply a prime coat of material which is required to be painted or finished, and which has not been prime coated by others. Re-coat primed and sealed surfaces where there is evidence of suction spots or unsealed areas in first coat, to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- J. Pigmented (Opaque) Finishes: Completely cover to provide an opaque, smooth surface of uniform finish, color appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, or other surface imperfections will not be acceptable.
- K. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint Work not in compliance with specified requirements.

3.05 FIELD QUALITY CONTROL

- A. Testing of Paint Materials: Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when paints are being applied:
 - 1. Owner will engage the services of a qualified testing agency to sample paint materials being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will perform tests for compliance of paint materials with product requirements.
 - 3. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements.
 - 4. Contractor shall remove non-complying-paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials.
 - 5. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

3.06 CLEANING AND PROTECTION

- A. Cleaning: During the progress of the Work, remove from the site all discarded paint materials, rubbish, cans and rags at the end of each workday. Upon completion of painting work, clean window glass and other paint-spattered surfaces. Remove spattered paint by proper methods of washing and scraping, using care not to scratch or otherwise damage finished surfaces.

- B. Protection: Protect Work of other trades, whether to be painted or not, against damage by painting and finishing Work. Correct damage by others for protection of their Work, after completion of painting operations. At the completion of Work of other trades, touch-up and restore all damaged or defaced painted surfaces.

3.07 EXTERIOR PAINTING SCHEDULE

- A. Provide the following Benjamin Moore paint systems for the various substrates, as indicated:

- 1. Ferrous and Zinc Coated Metal
 - a. Prime Coat: Super Spec HP P04 Acrylic Metal Primer
 - b. Intermediate Coat: Super Spec HP P29 D.T.M. Acrylic Semi-gloss
 - c. Topcoat: Super Spec HP P29 D.T.M. Acrylic Semi-gloss
- 2. Steel Shop Primed: (structural steel framing exposed to view including steel lintels)
 - a. Prime Coat: Super Spec HP P04 Acrylic Metal Primer
 - b. Intermediate Coat: Super Spec HP P29 D.T.M Acrylic Semi-gloss
 - c. Topcoat: Super Spec HP P29 D.T.M Acrylic Semi-Gloss

- B. Provide the following Ferrell-Calhoun paint systems for the various substrates, as indicated:

- 1. Ferrous and Zinc Coated Metal
 - a. Prime Coat: F/C #5-56 Waterborne 100% Acrylic All Purpose Metal Primer (1.8 mils DFT)
 - b. Intermediate Coat: F/C Tuff-Boy 8000 Line Waterborne 100% Acrylic DTM (1.7 mils DFT)
 - c. Topcoat: F/C Tuff-Boy 8000 Line Waterborne 100% Acrylic DTM (1.7 mils DFT)
- 2. Steel Shop Primed: (structural steel framing exposed to view including steel lintels)
 - a. Prime Coat: F/C #5-56 Waterborne 100% Acrylic All Purpose Metal Primer (1.8 mils DFT)
 - b. Intermediate Coat: F/C Tuff-Boy 8000 Line Waterborne 100% Acrylic DTM (1.7 mils DFT)
 - c. Topcoat: F/C Tuff-Boy 8000 Line Waterborne 100% Acrylic DTM (1.7 mils DFT)

- C. Provide the following PPG Paints, Inc. paint systems for the various substrates, as indicated:

- 1. Ferrous and Zinc Coated Metal
 - a. Prime Coat: PPG Pitt Tech DTM Acrylic Primer Finish, 90-712 Series (2.0-3.0 mils dry)
 - b. Intermediate Coat: PPG Pitt Tech DTM Acrylic Gloss Enamel, 90-374 Series (2.0-3.0 mils dry)
 - c. Topcoat: PPG Pitt Tech DTM Acrylic Gloss Enamel, 90-374 Series (2.0-3.0 mils dry)
- 2. Steel Shop Primed: (structural steel framing exposed to view including steel lintels)
 - a. Prime Coat: PPG Pitt Tech DTM Acrylic Primer Finish, 90-712 Series (2.0-3.0 mils dry)
 - b. Intermediate Coat: PPG Pitt Tech DTM Acrylic Gloss Enamel, 90-374 Series (2.0-3.0 mils dry)
 - c. Topcoat: PPG Pitt Tech DTM Acrylic Gloss Enamel, 90-374 Series (2.0-3.0 mils dry)

- D. Provide the following Rust-Oleum paint systems for various substrates, as indicated:
1. Ferrous and Zinc Coated Metal
 - a. Prime Coat: Rust-Oleum Universal Primer, (1.0-2.0 mils dry)
 - b. Intermediate Coat: Rust-Oleum 3700 Series DTM Acrylic, (2.0-3.0 mils dry)
 - c. Topcoat: Rust-Oleum 3700 Series DTM Acrylic, (2.0-3.0 mils dry)
 2. Steel Shop Primed: (structural steel framing exposed to view including steel lintels)
 - a. Prime Coat: Rust-Oleum Universal Primer (1.0-2.0 mils dry)
 - b. Intermediate Coat: Rust-Oleum Sierra Performance Beyond No VOC UMA (2.0-3.0 mils dry)
 - c. Topcoat: Rust-Oleum Sierra Performance Beyond No VOC UMA (2.0-3.0 mils dry)
- E. Provide the following Sherwin-Williams paint systems for the various substrates, as indicated:
1. Ferrous and Zinc Coated Metal
 - a. Prime Coat: S-W ProCryl® Universal Primer, B66-310 Series (2.0-4.0 mils dry)
 - b. Intermediate Coat: Sher-Cryl™ HPA Acrylic, B66-350 Series (2.5-4.0 mils dry)
 - c. Topcoat: Sher-Cryl™ HPA Acrylic, B66-350 Series (2.5-4.0 mils dry)
 2. Steel Shop Primed: (structural steel framing exposed to view including steel lintels)
 - a. Prime Coat: S-W ProCryl® Universal Primer, B66-310 Series (2.0-4.0 mils dry)
 - b. Intermediate Coat: S/W Sher-Cryl™ HPA Acrylic, B66-350 Series (2.5-4.0 mils dry)
 - c. Topcoat: S/W Sher-Cryl™ HPA Acrylic, B66-350 Series (2.5-4.0 mils dry)

3.08 INTERIOR PAINTING SCHEDULE

- A. Provide the following Benjamin Moore paint systems for the various substrates, as indicated:
1. Gypsum Drywall (Semi-Gloss)
 - a. Prime Coat: #N534 Ultra Spec 500 Interior Latex Primer
 - b. Intermediate Coat: #N539 Ultra Spec 500 Interior Semi-gloss Enamel
 - c. Topcoat: #N539 Ultra Spec 500 Interior Semi-gloss Enamel
 2. Gypsum Drywall (in wet areas)
 - a. Prime Coat: #N534 Ultra Spec 500 Interior Latex Primer
 - b. Intermediate Coat: #V341 Waterborne Epoxy
 - c. Topcoat: #V341 Waterborne Epoxy
 3. Concrete Masonry Units (Enamel)
 - a. Prime Coat: #206 Super Spec Hi-Build Block Filler
 - b. Intermediate Coat: #N539 Ultra Spec 500 Interior Semi-Gloss Enamel
 - c. Topcoat: #N539 Ultra Spec 500 Interior Semi-Gloss Enamel
 4. Ferrous and Zinc Coated Metal
 - a. Prime Coat: P04 Super Spec HP Acrylic Metal Primer
 - b. Intermediate Coat: #N539 Ultra Spec 500 Interior Semi-Gloss Enamel
 - c. Topcoat: #N539 Ultra Spec 500 Interior Semi-Gloss Enamel

- B. Provide the following Ferrell-Calhoun paint systems for the various substrates, as indicated:
1. Gypsum Drywall (Semi-Gloss)
 - a. Prime Coat: F/C #380 Perfik-Seal Interior Latex Primer/Sealer (1.8mils DFT)
 - b. Intermediate Coat: F/C #3300 Line Evergreen "Zero Voc" Acrylic Int/Ext Semi-Gloss Enamel (2.0 mils DFT)
 - c. Topcoat: F/C #3300 Line Evergreen "Zero Voc" Acrylic Int/Ext Semi-Gloss Enamel (2.0 mils DFT)
 2. Gypsum Drywall (in wet areas)
 - a. Prime Coat: F/C#235 Interior/Exterior 100% Acrylic Latex Undercoater (1.7 mils DFT)
 - b. Intermediate Coat: F/C #3300 Line 100% Acrylic Interior Semi-Gloss Enamel (1.6 mils DFT)
 - c. Topcoat: F/C #3300 Line 100% Acrylic Interior Semi-Gloss Enamel (1.6 mils DFT)
 3. Concrete Masonry Units (Enamel)
 - a. Prime Coat: F/C #470A Interior/Exterior Acrylic Latex Masonry Block Filler (10 mils DFT)
 - b. Intermediate Coat: F/C #600 Line 100% Acrylic Interior Semi-Gloss Latex Enamel (1.9 mils DFT)
 - c. Topcoat: F/C #600 Line 100% Acrylic Interior Semi-Gloss Latex Enamel (1.9 mils DFT)
 4. Ferrous and Zinc Coated Metal
 - a. Prime Coat: F/C #5-56 100% Acrylic All Purpose Metal Primer (1.8 mils DFT)
 - b. Intermediate Coat: F/C #600 Line 100% Acrylic Interior Semi-Gloss Latex Enamel (1.9 mils DFT)
 - c. Topcoat: F/C #600 Line 100% Acrylic Interior Semi-Gloss Latex Enamel (1.9 mils DFT)
- C. Provide the following PPG Paints, Inc. paint systems for the various substrates, as indicated:
1. Gypsum Drywall (Semi-Gloss)
 - a. Prime Coat: PPG Pure Performance Zero VOC Interior Latex Primer, 9-900 (1.4 mils dry)
 - b. Intermediate Coat: PPG Pure Performance Zero VOC Interior Latex Semi-Gloss, 9-500 (1.4 mils dry)
 - c. Topcoat: PPG Pure Performance Zero VOC Interior Latex Semi-Gloss, 9-500 (1.4 mils dry)
 2. Gypsum Drywall (in wet areas)
 - a. Prime Coat: PPG Pure Performance Zero VOC Interior Latex Primer, 9-900 (1.4 mils dry)
 - b. Intermediate Coat: PPG Pitt Glaze Waterborne Acrylic Epoxy, 16-551 Series (2.0-3.0 mils dry)
 - c. Topcoat: PPG Pitt Glaze Waterborne Acrylic Epoxy, 16-551 Series (2.0-3.0 mils dry)
 3. Concrete Masonry Units (Enamel)
 - a. Prime Coat: PPG Speedhide Interior Exterior Latex Block Filler, 6-7 Series (7.4 mils dry)
 - b. Intermediate Coat: PPG Interior Exterior Semi-Gloss Acrylic Metal Finish, 7-374 (1.5 to 2.0 mils dry)
 - c. Topcoat: PPG Interior Exterior Semi-Gloss Acrylic Metal Finish, 7-374 (1.5 to 2.0 mils dry)

4. Ferrous and Zinc Coated Metal
 - a. Prime Coat: PPG Pitt-Tech DTM Acrylic Primer Finish, 90-712 (2.0 to 3.0 mils dry)
 - b. Intermediate Coat: PPG Interior Exterior Semi-Gloss Acrylic Metal Finish, 7-374 (1.5 to 2.0 mils dry)
 - c. Topcoat: PPG Interior Exterior Semi-Gloss Acrylic Metal Finish, 7-374 (1.5 to 2.0 mils dry)
- D. Provide the following Rust-Oleum paint systems for the various substrates, as indicated:
1. Gypsum Drywall (Semi-Gloss)
 - a. Prime Coat: Rust-Oleum Zinsser Dry Wall Primer (1.0-1.5 mils dry)
 - b. Intermediate Coat: Rust-Oleum Zinsser Perma White Interior Acrylic Semi-Gloss, (1.5-2.0 mils dry)
 - c. Topcoat: Rust-Oleum Zinsser Perma White Interior Acrylic Semi-Gloss, (1.5-2.0 mils dry)
 2. Gypsum Drywall (in wet areas)
 - a. Prime Coat: Rust-Oleum Zinsser Dry Wall Primer (1.0-1.5 mils dry)
 - b. Intermediate Coat: Rust-Oleum 5300 Series WB Epoxy (2.5-3.0 mils dry)
 - c. Topcoat: Rust-Oleum 5300 Series WB Epoxy (2.5-3.0 mils dry)
 3. Concrete Masonry Units (Enamel)
 - a. Prime Coat: Rust-Oleum Zinsser Water Tite Flexible Primer & Finish (5.0-6.0 mils dry)
 - b. Intermediate Coat: Rust-Oleum Zinsser Perma White Interior Semi Gloss Acrylic (1.5-2.0 mils dry)
 - c. Topcoat: Rust-Oleum Zinsser Perma White Interior Semi Gloss Acrylic (1.5-2.0 mils dry)
 4. Ferrous and Zinc Coated Metal
 - a. Prime Coat: Rust-Oleum Universal Primer, (1.0-2.0 mils dry)
 - b. Intermediate Coat: Rust-Oleum Zinsser Perma White Interior Semi Gloss Acrylic (1.5-2.0 mils dry)
 - c. Topcoat: Rust-Oleum Zinsser Perma White Interior Semi Gloss Acrylic (1.5-2.0 mils dry)
- E. Provide the following Sherwin-Williams paint systems for the various substrates, as indicated:
1. Gypsum Drywall (Semi-Gloss)
 - a. Prime Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28-2600 (1.0 mils dry)
 - b. Intermediate Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 (1.6 mils dry)
 - c. Topcoat: S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series (1.6 mils dry)
 2. Gypsum Drywall (in wet areas)
 - a. Prime Coat: S-W ProMar 200 Zero VOC Interior Latex Primer, B28-2600 (1.0 mils dry)
 - b. Intermediate Coat: S-W Waterbased Catalyzed Epoxy, B70W211/ B60V25 (2.5-3.0 mils dry)
 - c. Topcoat: S-W Waterbased Catalyzed Epoxy, B70W211/ B60V25 (2.5-3.0 mils dry)

3. Concrete Masonry Units (Enamel)
 - a. Prime Coat: S-W PrepRite Block Filler, B25W25 (8.0 mils dry)
 - b. Intermediate Coat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 (1.6 mils dry)
 - c. Topcoat: S-W ProMar 200 Zero VOC Interior Latex Semi-Gloss, B31-2600 (1.6 mils dry)
4. Ferrous and Zinc Coated Metal
 - a. Prime Coat: S-W ProCryl® Universal Primer, B66-310 Series (2.0-4.0 mils dry)
 - b. Intermediate Coat: S-W ProClassic Waterborne Acrylic Semi-Gloss, B31 Series (2.0-3.0 mils dry)
 - c. Topcoat: S-W ProClassic Waterborne Acrylic Semi-Gloss, B31 Series (2.0-3.0 mils dry)

END OF SECTION

SECTION 10 11 00 VISUAL DISPLAY SURFACES

PART 1- GENERAL

1.01 SECTION INCLUDES

- A. Visual display surfaces as described in this section. Types specified in this section include Markboards.

1.02 SUBMITTALS

- A. Submit manufacturer's technical data and installation instructions for each material and component parts, including data substantiating materials comply with requirements.
- B. Samples: Submit two sets of full range of color samples for each type of visual display surface, surface, trim and accessories required.
- C. Shop Drawings: Submit for each type of visual display surface. Include sections of typical trim members and dimensioned elevations. Show anchors, grounds, reinforcement, accessories, and installation details.
- D. Certification: Submit manufacturer's certification that all materials furnished for Project complies with requirements specified herein.

1.03 QUALITY ASSURANCE

- A. Furnish all visual display surfaces by one manufacturer for entire project.
- B. Fire Hazard Classification: Provide tackboard surfaces which have been tested in accordance with ASTM E-84 and have been certified as complying with the following fire hazard classifications: Flame spread, fuel contributed and Smoke developed not more than 25.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by Claridge Products and Equipment, Inc., P.O. Box 910, Harrison, AR 72602. Tel. (870) 743-2200.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Draper, Inc., P.O. Box 425, Spiceland, IN 47385. Tel. (765) 987-7999.
 - 2. March Industries, Inc., P.O. Box 509, Dover, OH 44622. Tel. (330) 343-8825.
 - 3. NACO, 180 N. Sherman Ave., Corona, CA 91720. Tel. (909) 340-2800.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 MATERIALS

- A. Marker Board: Equal to Claridge Commercial Series, COM48L, with LCS III porcelain enamel steel markerboard dry erase writing surface in number 100 white and clear satin anodized heavy gauge extruded aluminum trim. Provide units with a continuous map rail with cork insert and chalk trough. Include map hooks, felt eraser, and assorted LCS markers. Size shall be 4 feet by 8 feet. Provide in locations and quantity as indicated on the Drawings.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Installer shall examine areas and conditions under which units are to be installed and notify Contractor in writing of conditions detrimental to proper and timely completion of Work. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION

- A. Deliver factory-built units completely assembled in one piece without joints.
- B. Install units in locations centered on wall where shown on Drawings and at mounting heights in accordance with manufacturer's instructions, keeping perimeter lines straight, plumb, and level. Provide all grounds, clips, backing materials, adhesives, brackets, anchors, trim, and accessories for complete installation
- C. Coordinate job-assembled units with grounds, trim, and accessories. Join all parts with neat, precision fit.

3.03 ADJUSTING AND CLEANING

- A. Verify accessories required for units are properly installed and operating units are adjusted and properly functioning.
- B. Clean units in accordance with manufacturer's instructions, breaking in only as recommended.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Signage for room identification system, informational and directional signage, and exterior individual building signage.

1.02 RELATED SECTIONS

- A. Section 09 05 15 – Color Design.

1.03 SUBMITTALS

- A. Submit manufacturer's technical data and installation instructions for each type of sign required.
- B. Samples: Submit two sets of samples of each color and finish of exposed materials and accessories required for specialty signs. Printed color samples are not acceptable. Project Engineer / MDOT Architect's review of samples will be for color and texture only. When requested, furnish full-size samples of specialty sign materials.
- C. Shop Drawings: Submit Shop Drawings for fabrication and erection of specialty signs. Include plans, elevations, and large-scale details of sign wording and lettering layout. Show anchorage and accessory items. Furnish location template drawings for items supported or anchored to permanent construction. For exterior letters, submit layout showing spacing on wall elevation. Submit layout drawings of each interior sign type. Submit layout drawings of each vinyl sign type. Submit full text sign schedule listing each sign for review of text.

1.04 QUALITY ASSURANCE

- A. Provide each type of sign as a complete unit produced by a single manufacturer including necessary mounting accessories, fittings and fastenings.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver components correctly packed to prevent damage. Store in secure area out of weather. Handle per manufacturer's instructions.

1.06 WARRANTY

- A. Provide manufacturer's standard one-year warranty covering manufacturing defects. Warranty shall be one year from substantial completion.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by ASI Sign Systems, Inc., 3890 W. NW Hwy, Suite 102, Dallas, TX 75220. Tel. (800) 274-7732.

- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Matthews International Corp., Pittsburgh, PA. Tel. (800) 628-8439.
 - 2. Metal Arts, Mandan, ND. Tel. (701) 663-6535.
 - 3. Mohawk Sign Systems, Inc., Schenectady, NY. Tel. (518) 370-3433.
 - 4. Scott Sign Systems, Inc., Sarasota, FL. Tel. (800) 237-9447.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements

2.02 SIGN SYSTEM

- A. Interior signage: Wall mounted InTac system with at each interior door. Design so that paper insert can be installed from each end.

2.03 COMPONENTS – INTERIOR SIGNAGE

- A. Window Inserts: Laser printed paper insert.
- B. Finish: Anodized Aluminum. Room number font finish to be selected.
- C. Sign Face at text window: Clear, matte first surface.
- D. Adhesive: Pressure sensitive, adhesive film on second surface.
- I. Sizes as follows:
 - 1. Type 1: At all interior room doors except as noted otherwise: 8 inches wide by 8 inches high. 1-1/2 inch top band. 3 inch high paper insert window running the full sign width. Bottom band to have Braille and tactile copy of room number only.
 - 2. Type 2: 8 inches wide by 8 inches high: Typical ADA / restroom signage at HC Toilet 110. Restroom signage at Men's 108 and Women's 109 with directional info to ADA restroom 110.

2.04 BRAILLE AND TACTILE COPY

- A. Comply with requirements of the 2010 Americans with Disabilities Act. Tactile copy to be raised 1/32-inch minimum from sign first surface by manufacturer's photomechanical stratification processes. Translation of copy into Braille shall be the responsibility of the manufacturer. Braille Tags shall be clear raster balls to be drilled and tapped using manufacturer's standard procedure complying with ADA.

2.05 FINISHES – INTERIOR SIGNAGE

- A. Colors: Selected from manufacturer's standard.
- B. Surface Texture: Matte.

2.06 FONT

- A. Shall be Helvetica Medium, unless noted otherwise.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Installer shall examine the substrates and conditions under which the specialty signs are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION

- A. Install sign units and components at the locations shown or scheduled, securely mounted with concealed theft-resistant fasteners, unless otherwise indicated. Attach signs to substrates in accordance with the manufacturer's instructions, unless otherwise shown.
- B. Install level, plumb, and at the proper height. Cooperate with other trades for installation of sign units to finish surfaces. Repair or replace damaged units as directed by the Project Engineer.
- C. Position sign on wall surface at locations and heights to comply with 2010 Americans with Disabilities Act.
- D. Install with clean, white, paper inserts containing the room name in capital letters, left justified, Helvetica, bold, in a size large enough to be legible from several feet away. All signs shall have the same size text.

END OF SECTION

SECTION 10 22 13

WIRE MESH PARTITIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. Wire mesh partitions and gates for security storage.

1.02 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information including installation instructions.
- B. Shop Drawings: Submit Shop Drawings for fabrication and installation, indicating field dimensions. Included plans, elevations, details, and sections indicating connections to existing work. Indicate materials, finishes, fasteners, joinery, hardware, and other information to determine compliance with specified requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Deliver all materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label.

1.04 QUALITY ASSURANCE

- A. The manufacturer shall have a minimum of five years experience in the manufacture and fabrication of wire mesh partitions.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: All components shall be from one manufacturer.
- B. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 MATERIAL QUALITY

- A. Provide the heavy duty secured storage quality grade of the various types of components as regularly manufactured by acceptable manufacturers.PANELS
- C. Provide 10 guage steel wire crimped and woven in to 2 inch by 1 inch opening rectangular mesh, securely welded into a fram of 1-1/4 inch x 1-1/4 inch x 1/8 inch steel angle factory punched with 7/8 inch x 7/16 inch slotted holes to accept 3/8 inch mounting hardware. Panels four to six feet wide shall have one 1/4 inch x 3/4 inch flat stiffener, wider panels receive two 1/4 inch x 3/4 inch stiffeners. All panels shall be fastened to posts with 3/8 inch x 3 inch plated bolts and nuts.

2.03 HINGED DOORS

- A. Shall be constructed of the same materials as the panels with two 1/4 inch x 3/4 inch horizontal stiffeners across the width, and two diagonal 1/4 inch x 3/4 inch stiffeners from center to the corner. Hinged doors shall be equipped with padlock lugs, three 4 inch x 4 inch spun pin hinges, and pick plate/slam bar assembly.

2.04 POSTS

- A. Shall be made of 2 inch by 2 inch by 14 gage tubing. Base plates of 2 inch by 7 inch by 1/4 inch steel flat with two 7/16 inch round holes for anchoring, shall be welded to each tube. Posts are factory drilled with 1/2 inch holes to accept hardware for mounting panels.

2.05 HARDWARE

- A. Shall be 3/8inch standard thread grade two plated nuts and bolts. Floor anchors are 3/8 inch wedge type-provided.

2.06 FINISH

- A. Non-plated parts receive one coat of grey acrylic enamel. Touchup paint included with each shipment.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Installer must examine the areas and conditions under which Work is to be completed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the Applicator. Starting of the Work will be construed as acceptance of the surfaces and conditions within any particular area.

3.02 CLEANING AND PROTECTION

- A. Cleaning: During the progress of the Work, remove from the site all discarded materials and rubbish end of each workday. Upon completion of work, clean surfaces.
- B. Protection: Before final inspection, clean exposed surfaces with water and a mild soap not harmful to finishes. Protect assemblies from damage during construction. Clean and touch up minor abrasions in finishes.

END OF SECTION

SECTION 10 44 16 FIRE EXTINGUISHERS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Portable, multi-purpose, dry-chemical and class K wet chemical fire extinguishers including cabinets, accessories and mounting brackets.

1.02 SUBMITTALS

- A. Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required.

1.03 QUALITY ASSURANCE

- A. Provide new portable fire extinguishers which are UL listed and bear UL "Listing Mark" for each type, rating, and classification of extinguisher indicated.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by J.L. Industries, Inc., 4450 W. 78th Street Circle, Bloomington, MN 55435. Tel. (612) 835-6850.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Amerex Corp., Trussville, AL. Tel. (205) 655-3271.
 - 2. Larsen's Mfg. Co., Minneapolis, MN. Tel. (612) 571-1181.
 - 3. Potter-Roemer, Santa Ana, CA. Tel. (800) 366-3473.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 FIRE EXTINGUISHERS

- A. Provide fire extinguishers for each location indicated, in colors and finishes that comply with requirements of governing authorities.
- B. Multi-Purpose Dry Chemical for Cabinet Mounting: Equal to J.L. Industries Cosmic 10E, UL rated 4A-80BC, 10 lb. nominal capacity.
- C. Class K Wet Chemical for Cabinet Mounting: Equal to J.L. Industries Saturn 15, UL rated 2-A:1-B: C: K, 6 liters nominal capacity. Locate in Kitchen.

2.03 EXTINGUISHER CABINETS

- A. Equal to J.L. Industries Cosmopolitan surface mounted with optional rolled edge cabinet. Cabinet shall accommodate the Cosmic 10E extinguisher. Vertical duo panel clear acrylic glazing with handle. Provide black vertical decal FE letters.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights to comply with applicable regulations of governing authorities.
- B. Securely fasten mounting brackets to structure, square and plumb, to comply with manufacturer's instructions.
- C. Fire Extinguisher units shall be mounted in exposed locations indicated, or if not indicated, in a manner such that no point in the building will be further than 75 feet from an extinguisher. Provide in locations shown on Drawings. Units shall be required in all Break Rooms and within 20 feet of all Mechanical Rooms and exits. Type K units shall be required in all Break Rooms.
- D. Check all cabinets for scratched, nicked, and other surface defects. Cabinets with these conditions shall be repaired or replaced.

END OF SECTION

SECTION 11 31 15

RESIDENTIAL APPLIANCES AND EQUIPMENT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Residential appliances as specified herein

1.02 SUBMITTALS

- A. Submit manufacturer's brochures, technical data, installation, maintenance and operating instructions for each item and component part specified, including data substantiating that materials comply with requirements.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Equivalent products by the following manufacturers are acceptable:
 - 1. GE Appliances, Louisville, KY. Tel. (800) 626-2000.
 - 2. Frigidaire (800) 374-4432
 - 3. Maytag (800) 344-1274
 - 4. Whirlpool (866) 698-2538
- B. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 APPLIANCES

- A. Refrigerator: Provide 18.2 cu. ft. capacity equal to GE Model GTE18ITHWW Top-Freezer Refrigerator, frost free freezer, White. Provide in Break Room 112.

PART 3 - EXECUTION

3.01 PREPARATION AND COORDINATION

- A. Remove existing refrigerator. Thoroughly clean area prior to installation of new unit.

3.02 INSTALLATION

- A. Remove shipping packaging and install components as per manufacturer's instructions.
- B. Modify (if required) swing of refrigerator door to open toward adjacent base cabinets.

3.03 CLEANING AND PROTECTION

- A. At completion of installation, clean surfaces in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 11 52 13

PROJECTION SCREENS

PART 1-GENERAL

1.01 SUMMARY

- A. This Section includes requirements for roll-up, electrically operated wall mounted projection screens, operating devices, and accessories.

1.02 SUBMITTALS

- A. Submit shop drawings showing dimensions, method of attachment, structural support, bracing, and electrical wiring. Indicate attachments to substrate provided showing all adjacent materials.
- B. Submit samples of housing and screen finishes.
- C. Submit manufacturer's installation and maintenance instructions.
- D. Submit installer qualifications including list of similar completed projects.

1.03 QUALITY ASSURANCE

- A. Obtain projection screens from single manufacturer as a complete unit including necessary mounting hardware, motor, controls, limit switches, and accessories.
- B. Motorized projection screens shall be certified for use in the United States and Canada by Underwriters Laboratory (UL), Inc. and shall bear UL label.
- C. Installer shall have a minimum of five (5) years experience in the installation of similar screens and related devices.
- D. The screen manufacturer shall coordinate the actual size, location, drop, viewing area and other fabrication data with the provider of Audio Visual Equipment prior to submitting shop drawings and product data.

1.04 COORDINATION

- A. Coordinate layout and installation of projection screens with wall construction and related components penetrating or above ceilings such as lighting fixtures, mechanical equipment, ductwork, and fire-suppression system.
- B. Coordinate requirements for blocking, structural supports, and bracing to ensure adequate means for installation of screens.
- C. Coordinate requirements for power supply conduit, and wiring required for projection screen motors and controls.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver projection screens until building is enclosed, other construction within spaces where screens will be installed is substantially complete, and installation of screens is ready to begin.

- B. Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.
- C. Store and handle screens in strict accordance with manufacturer's instructions.

PART 2-PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Draper, Inc., 411 South Pearl Street, Spiceland, Indiana 47385-0425; 765-987-7999.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Da-Lite
 - 2. Elite Screens
- C. Manufacturers of equivalent products may be acceptable upon strict compliance with the specified product requirements and approval by the Architect.

2.02 MOTORIZED, SURFACE MOUNTED, FRONT PROJECTION SCREENS

- A. Silhouette/Series E: Electric motor operated, extruded aluminum case. Contoured aluminum case with removable front cover, which conceals all mounting devices and fasteners including viewing surfaces that retract completely inside the case.

2.03 MATERIALS

- A. Motor mounted inside screen roller on rubber isolation insulators. Motor UL certified, rated 110-120V AC, 60 Hz, three wire, instantly reversible, lifetime lubricated with pre-set accessible limit switches.
- B. Motor Screen Controls, UL Certified: Key operated 3-position control switch rated 24V to stop or reverse screen at any point and low voltage 24V control unit with hand held RF remote three button control switch to stop or reverse screen at any point, built-in RF receiver, built-in Video Interface Control Trigger for 3V-28V, RS232, and dry contact relays.
- C. Motor shall be left mounted.
- D. Screen case: Contoured aluminum case finished in a white color.
- E. Joints: Viewing surface shall contain no seams.
- F. Projected Mounting Brackets with a 6-inch clearance from the wall. Projected Mounting Brackets shall have a white finish.
- G. Projection Viewing Surface: Argent White XH1500E: On Axis gain of 1.5. High reflectivity fabric with broad viewing cone. Excellent resolution and color balance. Flame and mildew resistant.
- H. Provide with black border option. 70 inches x 70 inches.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine areas where screens are to be installed and report any conditions detrimental to the proper installation and control of screen. Do not proceed with installation until detrimental conditions are corrected. Coordinate the work of this Section with the work of other sections that are interfaced, attached or otherwise connected.
- B. Install projection screens and controls at locations and heights indicated on Drawings. Coordinate with Architect prior to installation.
- C. Comply with screen manufacturer's written instructions and shop drawings.

3.02 INSTALLATION

- A. Install projection screens and controls at locations and heights as directed by the Architect.
- B. Comply with screen manufacturer's written instructions and approved shop drawings.
- C. Install screens securely to supporting substrate so that screens are level and back of case is plumb.
- D. Provide required brackets, hanger rods, and fasteners.
- E. Prior to installation, verify type and location of power supply.

3.03 TESTING AND DEMONSTRATING

- A. Test motorized projection screens to verify that screen, controls, limit switches, closure, and other operating components are functional. Ensure that screen is level and viewing surface plumb when extended. Correct deficiencies.
- B. Demonstrate operation of screen to Owner's designated representatives.

3.04 CLEANING AND PROTECTING

- A. Clean housing and exposed devices in accordance with manufacturer's instructions.
- B. Protect projection screens after installation from damage from construction operations. If damage occurs, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition.

END OF SECTION

SECTION 11 52 16 PROJECTORS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Ceiling mounted LCD Projector with accessories as required for a complete system as shown on the Drawings and as specified herein.

1.02 SUBMITTALS

- A. Submit manufacturer's brochures, technical data, installation, maintenance and operating instructions for each item and component part specified, including data substantiating that materials comply with requirements.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and Specifications are based on products manufactured by NEC, 1250 N. Arlington Heights Rd, Itasca, IL. 60143. Tel. (800) 632-4636.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Panasonic.
 - 2. Sony.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00 -Product Requirements.

2.02 PROJECTOR

- A. Equal to NEC model NP-P502H Professional Projector as follows:
 - 1. 5000 Lumens.
 - 2. 6000:1 Contrast Ratio.
 - 3. Dual HDMI inputs with HDCP
 - 4. Built-in HDBase T
 - 5. Variable audio-out for remote control adjustable volume
 - 6. 20W speakers
 - 7. Horizontal and vertical lens shift
 - 8. IEU Lite (Image Express Utility) Lite for audio and video transmission from computer to projector
 - 9. NaViSet Administrator 2: software for administration and management of larger display device installations
 - 10. Lamp: 375W AC, 5,000 hour life
 - 11. Lens zoom: 1 to 1.7

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install units plumb and level, in locations and with mountings as required. Securely attach to supporting structure with concealed fasteners, in accordance with manufacturer's installation instructions.
- B. Remove shipping packaging and install components as per manufacturer's instructions.
- C. Verify and provide all electrical hook-ups and electrical outlets required by the projector specified prior to rough-in.

3.02 CLEANING AND PROTECTION

- A. At completion of installation, clean surfaces in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 12 24 14

ROLLING BLACKOUT SHADES

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. This Section includes requirements for manual rolling window shades. Provide all window shades, accessories, attaching hardware, labor and equipment necessary for a complete installation as specified.
- B. The objective of the window shading system shall be to provide room darkening to facilitate video presentations.

1.02 SUBMITTALS

- A. Submit manufacturer's descriptive literature indicating materials finishes, construction, and installation instructions, and data verifying that product meets requirements specified. Include manufacturer's recommendations for maintenance and cleaning.
- B. Shop Drawings: Indicate field-measured dimensions of openings to receive rolling shades. Include illustrations of special accessory components not included in manufacturer's product data. Indicate details of head and sill conditions, corner conditions, and conditions between adjacent rolling shade units.
- C. Color Samples: Submit two 6 inch samples of material in color selected.

1.03 QUALITY ASSURANCE

- A. Manufacturer and installer shall have at least five years experience in this type of product and installation.

1.04 WARRANTY

- A. Provide manufacturer's standard five year written warranty against defects in materials and workmanship beginning at date of substantial completion.

1.05 PRODUCT DELIVERY

- A. Blinds shall be carefully handled and stored to prevent damage to materials, finishes and operating mechanisms.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on Mecho 5 MechoSystems as manufactured by MechoShade Systems, Inc., 42-03 35th Street, Long Island City, NY 11101; Telephone: 718-729-2020; Website: www.mechoshade.com
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Draper, Inc., 411 South Pearl St., Spiceland, Indiana 47385; Telephone: 800-238-7999; Website: www.draperinc.com
 - 2. Lutron Electronics Co., Inc.; 7200 Suter Rd Coopersburg, PA 18036-1299; Telephone: 610-282-3800; Website: www.lutron.com

- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 SHADE AND HOUSING MATERIALS

- A. Mount inside jamb of windows.
- B. Provide Mecho 5 standard bracket with optional Blackout Side Channels and Exposed Light Seal Hembars.
- C. Provide for universal, regular and offsetdrive capacity manual operated chain drive hardware and brackets, allowing drive chain to fall at front, rear, or non-offset for all shade drive end brackets. Universal offset shall be adjustable for future change.
- D. Shade fabric shall be:
 - 1. Openness factor shall be 0 percent Equinox Blackout 0100 Series opaque. Color shall be selected when submitted. Widths shall be inside of window jamb.
 - 2. Shading fabric shall be PVC-free fiberglass material with an opaque acrylic backing, 66 percent acrylic (coating), 34% fiberglass (yarn), meets or exceeds Fed. FR Spec NFPA 701. It shall be woven so that all yarn is interlocking and heat treated so that all material is totally bonded together.
 - 3. Fire Retardance: The described woven fabric shall have been tested by an approved laboratory and met the minimum requirements established by the National Fire Protection Association Test 701, and shall be fade resistance to commercially accepted standards.

PART 3 - EXECUTION

3.01 INSPECTION AND PREPARATION

- A. Shade installer shall inspect areas in which shades are to be installed and report any conditions that are detrimental to the installation or proper operation of the rolling shades. Report any conditions unacceptable in writing to the contractor and do not proceed with installations until conditions are corrected.

3.02 INSTALLATION

- A. Install shades in windows level and plumb and in accordance with manufacturer's product data and approved shop drawings.
- B. Clean finished installation of all spots, smears, stains and other foreign matter and remove all resulting debris from the site.

END OF SECTION

SECTION 12 48 43 FLOOR MATS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Metal-rails, tapered vinyl-frame, surfaced mounted, removable, carpeted floor mats for Building Entrances.

1.02 RELATED SECTIONS

- A. Section 09 05 15 – Color Design.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturers' product and technical data indicating compliance with these specifications and recommended maintenance practices.
- B. Shop Drawings: Submit materials description, component dimensions and details. Show plan view that clearly indicates traffic direction and size of mat.
- C. Colors: Submit samples of manufacturer's full range of available colors (minimum 20 for carpet) and finishes for materials exposed to view.

1.04 QUALITY ASSURANCE

- A. Single Source: All floor mats required by this Section shall be products of only one manufacturer.
- B. Manufacturer : Company regularly engaged in producing types of floor mats required by this Section and with minimum 10 years documented satisfactory experience

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Drawings and specifications are based on products manufactured by Construction Specialties, Inc. P.O. Box 380, Muncy, PA 17756. Tel. (888) 834-4455.
- B. Other acceptable manufacturers offering equivalent products:
 - 1. Arden Architectural Specialties, Inc., Saint Paul, MN. Tel. (651) 631-1607.
 - 2. J.L. Industries, Inc., Bloomington, MN. Tel. (612) 835-6850.
 - 3. R. C. Musson Rubber Co., Akron, OH. Tel. (330) 773-7651.
- C. Substitutions shall fully comply with specified requirements and Section 01 25 00-Substitution Procedures and Section 01 60 00-Product Requirements.

2.02 FLOOR MATS

- A. Equal to C/S "Pedimat" Surface-Mounted Tapered Vinyl Frame Floor Mat, Model M1-HD-SM.
- B. Install one floor mat at interior side of doors 103B, 104A, and 121C.

- C. Size: 7 feet wide by 6 feet deep (traffic direction) at double doors.
- D. Carpet Color: As selected by Project Engineer / MDOT Architect from full range of manufacturer's 25 standard colors.
- E. Rails: Extruded aluminum 6063-T52 as selected by Project Engineer / MDOT Architect from full range of manufacturer's 7 optional anodized colors.
- F. Carpet tread: Colorfast, solution dyed nylon tread, in color selected by Project Engineer / MDOT Architect, fusion bonded to rigid two-ply backing supplied in continuous splice-free lengths. Anti-static carpet fiber shall contain an antimicrobial additive and "Scotchgard" soil reducing treatment.
- G. Frame: Tapered vinyl with mitered corners. Color as selected by Project Engineer / MDOT Architect from full range of manufacturer's six standard colors (match rail color).

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install unit(s) level, in locations as described. Install mats after Final Cleaning of Project Floor.

3.02 CLEANING AND PROTECTION

- A. At completion of installation, clean surfaces in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 22 01 00

PLUMBING GENERAL PROVISIONS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide all labor, materials, tools, and services for a complete installation of equipment and systems contained in contract documents.
- B. Principal features of work included are:
 - 1. Plumbing system.
 - 2. Demolition of existing equipment, and piping.
 - 3. Seismic bracing and anchorage for equipment, and piping.

1.2 RELATED WORK

- A. Electrical power and interlock and control wiring and conduit.
- B. Field painting of equipment, and piping.

1.3 GENERAL

- A. The contract documents form a guide for a complete system. Provide all items necessary to provide a complete system but not specifically mentioned, such as hangers, transitions, offsets, and drains.
- B. Layouts indicated on drawings are diagrammatical only. Coordinate exact location of equipment, ductwork, and piping to eliminate conflict with other divisions. Designer reserves right to make reasonable changes in location of equipment, ductwork, and piping prior to construction.
- C. Should Contractor find during progress of work that in his judgment existing conditions make desirable a modification, report such item promptly to Designer for instructions. Do not make deviations from contract documents without review of Designer.
- D. Supervise all work with a competent mechanic specifically qualified in mechanical discipline.
- E. All products used for dispensing potable drinking water must be lead free and meet the requirements of NSF 61 and NSF 372 test standards via third party testing and certification.

1.4 PERMITS

- A. Secure and pay for permits, licenses, and inspections for work under this Division, including water and sewage connections.

1.5 CODES

- A. Comply with all pertinent local, state, and national codes.

1.6 STANDARDS

- A. Comply with all pertinent standards. This list is provided as a convenience to Contractor and is not to be considered all inclusive.
 - 1. American Gas Association (AGA).
 - 2. CISPI Standard 301.
 - 3. ASTM A 74.

1.7 SUBMITTALS

- A. Submit for review complete brochures and shop drawings for materials and equipment proposed.
 - 1. Brochures: Submit complete descriptions, illustrations and specification data for materials and equipment proposed. Clearly indicate proposed items when other items are shown on same sheet. Submit samples on request and/or set up for inspection. Samples will be returned to Contractor.
 - 2. Submittals shall be submitted in line by line format. Each submittal shall be provided with a cover letter and supporting documentation indicating how the submittal meets each line of the referenced specification section. All discrepancies between the construction documents and the submitted product shall be clearly identified for engineer evaluation.
 - 3. If a product other than the basis of design is rejected by the engineer for any reason, the Contractor shall provide the basis of design product at no additional cost to the Owner.
 - 4. Shop Drawings:
 - a. Complete equipment and piping systems in equipment rooms.
 - b. Complete equipment and piping systems in entire building.
 - c. Owner furnished equipment rough-in layouts.
 - d. Kitchen equipment rough-in layouts.
 - e. Laboratory equipment rough-in layouts.
 - f. Firestop systems.
 - 5. Seismic Certification: Submit letter of certification from each equipment manufacturer verifying that equipment is designed to withstand horizontal forces using a "cp" factor of 0.75 applied in any direction.

1.8 PROJECT MAINTENANCE MANUALS

- A. Prior to final acceptance of project, provide Owner with bound maintenance manuals.

1.9 PROJECT TECHNICAL INSTRUCTION

- A. Prior to final inspection of project, provide technical instruction to Owner as follows:
 - 1. Field Instruction: Provide explanation of how systems and equipment are to operate during each season and during emergencies.
 - 2. Field Demonstration: Demonstrate operation and routine maintenance for systems and equipment.
 - 3. Videotape: Provide videotape or DVD of field instruction and demonstration to Owner at completion.

1.10 CONSTRUCTION RECORD DOCUMENTS


- A. Provide construction record documents. Keep at the project one set of drawings and daily record changes at the time they are made. Give drawings to Owner at project completion.

1.11 EXISTING SERVICES

- A. Maintain existing services in operation during construction. Coordinate and schedule all service interruptions with Owner.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Provide materials and equipment of domestic manufacturer bearing the U.L. label when such label is available.
- B. Cast Iron Soil Pipe and Fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute  and listed by NSF[®] International.

PART 3 -EXECUTION

3.1 COORDINATION

- A. Coordinate locations of equipment and piping to eliminate conflict with other divisions.
- B. Carefully examine contract documents to be thoroughly familiar with items which require plumbing or mechanical connections and coordination.
- C. Provide proper chases and openings. Place sleeves and supports prior to pouring concrete or installation of masonry.

3.2 CUTTING AND PATCHING

- A. Repair or replace routine damage caused by cutting in performance of contract.
- B. Correct unnecessary damage caused due to installation of plumbing work.
- C. Perform repairs with materials that match existing in accordance with the appropriate section of these specifications.

3.3 FLASHING, COUNTERFLASHING, AND SEALING

- A. Flash, counterflash, and seal piping at penetrations of roofs and outside walls.

3.4 TRENCHING, EXCAVATION AND BACKFILLING

- A. Excavate to a depth at least 6" below bottom of pipe and a minimum of 36 inches above top of pipe. Fill below pipe, around pipe, and minimum of 12 inches above pipe with sand or Class "B" crushed stone tamped firm and even. Provide topsoil for final layer of dirt (12 inches minimum). Provide 6 inches spacing between pipes and between pipe and trench sides. Hand-grade with batterboards placed every 25'-0". Backfill by hand. Do not use rock or stone above sand or Class "B" crushed stone.

3.5 CONNECTION TO EQUIPMENT

- A. Rough-in and connect to sterilizers, lab equipment, kitchen equipment, and Owner furnished equipment and provide a shutoff valve and union at each connection. Operating valves and/or controls for this equipment will be provided as an integral part of the equipment. Do not rough-in until shop drawings showing rough-in locations have been reviewed by Designer.

3.6 FOUNDATIONS AND PADS

- A. Provide foundations, pads, and bases required for equipment. Concrete to be in accordance with concrete division of specifications.
- B. Coordinate proper sizes and locations of foundations, pads, bases, anchors, supports, and other items to be built into structure.

3.7 IDENTIFICATION

- A. Identify exposed or accessible piping with stenciling contents indicating pipe contents and direction of flow on piping not more than 20 feet apart, at valves, at access panels, and at least once above each space.
- B. Contractors option to identify exposed or accessible piping with snap-on or strap-on type markers. Color code markers in accordance with ANSI. Indicate pipe contents and direction of flow on marker. Install markers on piping not more than 20 feet apart, at valves, at access panels, and at least once above each space.
- C. Include design operating pressures in psig for compressed air services.
- D. Sanitary waste, storm and buried lines need not be marked.
- E. Identify all equipment with engraved brass, aluminum, or stainless steel nameplates or tags. Use equipment names and numbers appearing in schedules on drawings. Fasten nameplates to equipment using screws. Glue or adhesive is not acceptable. Fasten tags to equipment using brass, aluminum or stainless steel chains.
- F. Identify each valve with engraved brass, aluminum, or stainless steel identification tag indicating valve service and sequential identification number. Attach tag to valve handle with brass, aluminum or stainless steel chain. Provide two bound manuals to Owner listing each valve sequentially and indicating valve manufacturer, style, size, service, normal position, and specific location for each valve.

3.8 CLEANING

- A. Repair damaged factory finishes covering all bare places and scratches.
- B. Cleaning Domestic Water System: Flush domestic water system progressively by opening building outlets and permitting flow to continue from each until water runs clear. Sterilize system in accordance with requirements of State Department of Public Health by the following method or other method acceptable to local authorities:
 - 1. Introduce chlorine or a solution of calcium or sodium hypochlorite, filling lines slowly and applying sterilizing agent at a rate of 50 ppm of chlorine as determined by residual chlorine tests at ends of lines. Open and close all valves while the system is being chlorinated.
 - 2. After sterilizing agent has been applied and left standing for 24 hours, test for residual chlorine at ends of lines. If less than 25 ppm is indicated, repeat sterilizing process.
 - 3. After standing for 24 hours and tests show at least 25 ppm of residual chlorine, flush out system until all traces of chemical used are removed.

3.9 TESTING

- A. Test all installed equipment and systems and demonstrate proper operation. Correct and retest work found defective when tested.
- B. Thoroughly check piping system for leaks. Do not add any leak-stop compounds to the system. Make repairs to piping system with new materials. Peening, doping, or caulking of joints or holes is not acceptable.
- C. Test hot and cold domestic water piping systems upon completion of rough-in and before connection to fixtures at a water pressure of 125 psig for two hours without leaks.
- D. Test drainage and venting system with necessary openings plugged to permit system to be filled with water and subjected to a minimum water pressure of 10 feet head at top of system. System to hold water for two hours without a water level drop greater than 4" in a 4" standpipe and without visible leakage. Test system in sections if minimum head can be maintained in each section.
- E. Conduct air or smoke test if in opinion of Designer reasonable cause exists to suspect leakage or low quality workmanship.
- F. Test foundation drain system in sections of 100 foot lengths before and after backfilling. Pass plumbers tape or Roto-Rooter through drain sections to ensure there are no restrictions to water flow.
- G. Test gas piping and compressed air piping with Nitrogen at 100 psi for two hours without leaks.
- H. Test flush valves for proper operation.

END OF SECTION

SECTION 22 05 47

SEISMIC RESTRAINT OF PLUMBING EQUIPMENT
AND SUSPENDED UTILITIES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide engineered seismic restraint systems for suspended and base mounted Domestic Water Piping and Valves, and Sanitary Waste and Vent utilities compliant with the 2012 International Building Code (IBC) with local building code amendments.
- B. All equipment manufacturers shall submit, as part of the equipment submittal, compliance certifications. Contractor to provide equipment anchorage details specific to each unit provided.
- C. At seismic restraint installation locations, provide vertical support systems engineered to accommodate dead load plus seismic force reactions.

1.2 RELATED SPECIFICATION SECTIONS

- A. Domestic Water Piping and Valves 221116.
- B. Sanitary Waste and Vent 221316.

1.3 REFERENCES

- A. Publications, codes and standards listed below form a part of this specification to the extent referenced.
 - 1. 2012 International Building Code (IBC)
 - a. Chapter 16 - Structural Design
 - b. Chapter 17 – Structural Tests And Special Inspections
 - 2. ASCE 7-05, Chapter 13, Minimum Design Loads For Buildings and Other Structures, American Society of Civil Engineers (ASCE).
 - 3. ACI 318, Building Code Requirements for Structural Concrete, American Concrete Institute (ACI).

1.4 COMPONENT IMPORTANCE FACTOR

- A. In order to identify systems requiring seismic restraint and to define those from which restraints may be excluded, utility components are assigned an ASCE 7 Importance Factor (I_p) on the basis of the following:
 - 1. $I_p = 1.5$
 - a. Occupancy Category III or IV, essential facilities required for post earthquake recovery – all “Designated Seismic Systems” per IBC Chapter 17 required for the continued operation of the facility.
 - b. Life-safety component which is required to function after a seismic event including fire protection sprinkler systems.
 - c. Components that contain hazardous or flammable materials.
 - 2. $I_p = 1.0$: All other components.

1.5 SUBMITTALS

- A. Equipment Certification.
1. Equipment manufacturer to provide certificate of compliance for 2012 IBC proxing on line capability for the project use group and seismic design category. Provide certifications for the following equipment: Components with hazardous contents, built up or field assembled plumbing equipment, fire suppression control panels, pre action control panels, and auxiliary or remote power supplies, and above ground storage tanks. Equipment manufacturer certification to be based on shake table or three dimensional shock testing or experience data as required by ASCE/SEI 7-05.
 2. The following equipment is considered rugged and does not require a certificate of compliance: pumps, valves, and motors.
- B. Contractor to identify and convey each overhead deck condition to which seismic attachments will be made. Information to include type and density of concrete, concrete thickness, size and gage of metal deck and any point load limitations or restrictions.
- C. Provide Seismic Design Force calculations per ASCE 7- 05, Formulas 13.3-1 thru 13.3-3 stamped by a registered design professional qualified civil or structural engineer licensed to practice in the State where project is located. For multi-story projects, provide calculated Seismic Design Force for each floor.
- D. Submit seismic restraint layouts stamped by a registered design professional qualified civil or structural engineer licensed to practice in the State where project is located. Seismic restraint layouts to show:
1. All vertical support and seismic brace locations.
 2. All anchorage connections to structure. Anchor brand, type, quantity and size.
 3. Vertical support and brace reaction point load at all connections to structure. For review by engineer of record in checking suitability of the building structure to accommodate imposed loads.
 4. Plan set sheets showing appropriate installation details reflecting actual job site conditions.
- E. Include cover sheet with Seismic Restraint Bracing Legend delineating:
1. Maximum Allowable Size or Utility Weight (Lbs/Lf).
 2. Minimum Vertical Support Rod Diameter.
 3. Support Rod Total Vertical Load.
 4. Maximum Allowable Transverse Brace Spacing.
 5. Transverse Brace Reaction.
 6. Maximum Allowable Longitudinal Brace Spacing.
 7. Longitudinal Brace Reaction.
 8. Minimum Required Seismic Restraint Brace Arm Assembly.
 9. Minimum Required Seismic Restraint Anchorage To Overhead Structure.
 10. Installation Detail Drawing References.

1.6 QUALITY ASSURANCE

- A. Registered design professional completing seismic submittal to check suitability of structure to accommodate applied seismic loads.
- B. Registered design professional completing seismic submittal is to provide a "Statement of Special Inspections" in conformance with 2006 IBC, Chapter 17.
- C. Each contractor responsible for the construction of a "Designated Seismic System" shall submit to the building official and owner prior to the commencement of work on the system or component a written "statement of responsibility" per IBC Chapter 17.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Seismic restraint hardware and engineering by International Seismic Application Technology (ISAT), Mason Industries, Tolco, or approved equal.
- B. Vertical support and seismic restraint anchorages to utilize Cast-In Place Deck Inserts, or Post Installed Anchors. All deck inserts or post installed anchors to have a valid ICC ESR evaluation report (or equal) substantiating the insert or anchor capacity.
- C. Vertical support and seismic restraint connections to structural steel are to utilize fixed Beam Clamp connections or Welded or bolted connections.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Roof mounted equipment: All roof mounted equipment is to be positively attached to roof support curb or isolators by bolting or welding. All support curbs to resist compressive, shear, tension, and rotational loads (including seismic loads) and translate these loads to building structure. The design of all support curbs shall be performed by an engineer licensed in the project state. Curb design to minimize rotational loads to structure and be positively attached to building structure by bolting or welding.
- B. For conditions not covered within pre-engineered drawings, the required engineering is to be performed by a registered Engineer.
- C. Manufacturer shall provide field installation training prior to commencement of install.
- D. Field relocation of any seismic installation points away from that shown on the furnished shop drawing layouts shall be coordinated with registered design professional who completed seismic submittal.
- E. Consult registered design professional who completed seismic submittal when field conditions prohibit compliance with the supplied installation details.

- F. In order to satisfy ASCE 7 minimum yield strength requirements, the allowable brace spacing for non-ductile systems (eg. cast iron, plastic and glass pipe) shall be no more than half that for ductile systems.

3.2 EQUIPMENT CONNECTIONS

- A. Where seismic bracing is allowed to be omitted due to size or proximity to overhead deck, all terminations to fixed equipment, panels, etc. or to other portions of the system requiring seismic restraint are to utilize flexible connectors.
- B. Where seismic bracing is allowed by code to be omitted due to size or proximity to overhead deck, contractor shall be responsible for assuring that damaging impact or vertical support failure cannot occur.

3.3 SPECIAL INSPECTION

- A. Special Inspection Requirements: All Designated Seismic Systems are subject to Special Inspection per IBC Chapter 17.
- B. Special inspection for mechanical components shall be provided as follows:
 - 1. For all Designated Seismic Systems within seismic design categories D, E or F.
 - 2. Periodic special inspection during the installation for flammable, combustible or highly toxic piping systems and their associated mechanical units in Seismic Design Categories C, D, E or F.
 - 3. Periodic special inspection during the installation of vibration isolation systems where the construction documents indicate a maximum clearance (air gap) between the equipment support frame and restraint less than or equal to 1/4 inch.
- C. Install identification tags at all seismic brace locations. Tags to include the following information:
 - 1. Specific seismic forces (g-force) the location was designed to resist.
 - 2. Maximum brace reaction at connection to structure.
 - 3. For single hung items, the maximum pipe/conduit size the brace location was designed to accommodate.
 - 4. For trapeze supported items, the maximum weight (lbs/lf) the brace location was designed to accommodate.
 - 5. For suspended equipment, the maximum unit operating weight (lbs) the brace location was designed to accommodate.
 - 6. Location identifier cross matched to that on plan set layout.
 - 7. Company name of installing contractor.
- D. Upon completion of construction a Quality Assurance Representative of registered design professional who completed seismic submittal shall review the installation of the seismic-force-resisting system and provide documentation indicating general conformance to seismic restraint layout drawing.

END OF SECTION

SECTION 22 07 19

PLUMBING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Contractor shall provide all necessary labor, materials, tools, and equipment to perform work required on the drawings and specified herein.
- B. Certain equipment and/or systems to be factory insulated by manufacturer. Factory insulation materials to be as specified in applicable sections of the specifications.
- C. All pipe fittings, valves, and strainers in insulated pipe systems to be insulated.
- D. Thermal resistance "R" values used herein are expressed in units of "Hour, Degrees F., Sq. Ft./BTU per Inch of Thickness" on a flat surface at a mean temperature of 75 degrees F.
- E. Note that where electric cable wrap is called for, insulation is to be applied over cable.
- F. "Contractor's Option" referred to in Materials below indicates optional materials which may be used as equals.

1.2 DEFINITIONS

- A. "Exposed" equipment, and piping are areas which will be visible without removing ceilings or opening access panels.
- B. Outdoors is considered exposed to the weather.
- C. Underground is buried, whereas in a trench below grade is considered concealed.

1.3 CERTIFICATION/QUALITY ASSURANCE

- A. Products shall meet applicable national, state, and local building codes and be U.L. (or other recognized testing lab) listed for intended service.
- B. All insulations, jackets, adhesives, coatings, sealers, and tapes shall have a flame spread rating of 25 or less and smoke development rating of 50 or less when tested in accordance with ASTM E-84, NFPA 225, U.L. 723, and further must meet the requirements of NFPA 90-A and applicable building, and plumbing, codes.
- C. All insulation materials shall be delivered and stored in manufacturers' containers and kept free from dirt, water, chemical, and mechanical damage.
- D. Insulation shall be applied in a workmanlike manner by experienced, qualified tradesmen.
- E. Insulation shall not be applied until all pressure testing has been completed, inspected, and released for insulation application.

- F. Surfaces shall be clean and dry.
- G. Insulation joints shall be butted firmly together and all jackets and tapes shall be smoothly and securely installed.
- H. Insulation for duct, pipe, and equipment for above grade exposed to weather outside building shall be certified as being self-extinguishing for 1" thickness in less than 53 seconds when tested in accordance with ASTM D-1692.

1.4 APPLICABLE CODES AND STANDARDS

- A. ASTM E-84.
- B. U.L. 723.
- C. State of Mississippi Energy Code.

PART 2 - PRODUCTS

2.1 MATERIALS FOR PIPE AND EQUIPMENT

- A. Materials for Pipe and Equipment: Provide factory pre-molded or shop or site mitered segment type insulation for pipe, pipe fittings, and valves. Fitting insulation to be of same thickness and material as adjoining pipe insulation. All insulation and related materials such as tape and mastic to meet applicable building code requirements for fire and smoke development.
 - 1. Flexible Tubular: Provide 25/50 rated, closed-cell, flexible tubular rubber type pipe insulation. Product to have continuous operational temperature limit of 200 degrees F. and a minimum "R" value of 3.7 per inch (K=0.27) at 75 degrees F mean temperature. Product to be Armstrong AP Armaflex or approved equal pipe insulation. Use flexible tubular for the following services:
 - a. Horizontal runs of waste lines carrying cold condensate from air conditioning equipment: 1 inch thick.
 - 2. Fiberglass: Provide factory-formed, factory-jacketed fiberglass piping insulation. Product to be Manville "Micro-Lok 650" with "Type AP-T" jacketing or equivalent product manufactured by CertainTeed, Knauf, or Owens-Corning. Product to have continuous operational temperature limit of 850 degrees F and a minimum "R" value of 4.3 per inch (K=0.23) at 75 degrees F mean temperature. Jacket to be fiberglass reinforced kraft paper with aluminum foil and pressure sensitive closure system. Vapor-barrier mastic for application to below ambient pipe insulation shall be fungus resistant per ASTM D 5590 with 0 growth rating; Water based; Permeance per ASTM E 96, Procedure B, 0.013 perm or less at 43-mil dry film thickness suitable for indoor and jacketed outdoor use. Products: Foster 30-80 AF. Color: White. A breather mastic for application to above ambient pipe insulation (fittings, tees, valves, etc) shall be water based Foster 46-50 mastic or Childers CP-10 / CP-11. Use fiberglass piping insulation for the following services:
 - a. Domestic hot water supply without recirculating system: 1-1/4 inches and under - 1/2 inch thick; 1-1/2 inches and greater – 1 inch thick.

- b. Domestic hot water supply and recirculating return piping: All sizes – 1 inch thick.
- c. Domestic cold water piping: 1/2 inch thick.

2.2 MATERIALS FOR FITTINGS, VALVES, AND SPECIAL COVERINGS

- A. Provide coverings and finishes for specific items hereinafter specified.
 - 1. Use pre-molded insulation fabricated by the manufacturer of insulation material or shop or site mitered segment type insulation for all pipe fittings, elbows, tees, valves, and couplings.
- B. For any service, when below grade direct buried, cover straight pipe and fitting insulation with equivalent of Pittsburgh Corning "Pittwrap", Foster C.I. Wrap 50 mil or "Pittwrap SS11" jacketing. Valves in systems operating above 60 degrees F. and installed in valve boxes shall not be insulated; however, the valves shall be painted with a rust resistant product equivalent to Rustoleum.
- C. For flexible tubular pipe and fitting insulation when exposed-to-view inside building or exposed to the weather, finish with two coats of paint, custom color blended to match surrounding surfaces.
- D. When specifically approved by designer, when it is impossible to completely insulate pipe, fittings, or valves with specified insulation, Armstrong Armaflex insulation tape may be used to prevent condensate drip on small piping. Use of cork insulation tape is prohibited.

PART 3 - EXECUTION

3.1 GENERAL

- A. No insulation shall be cut where a hanger is located. If hangers have been installed by pipefitter tradesmen which violates this strict requirement, notify Designer immediately.
- B. Piping systems shall be tested and found free of all leaks prior to installation of insulation covering.
- C. All surfaces shall be clean and dry when covering is applied. Covering to be dry when installed and during application of any finish, unless such finish specifically requires a wetted surface for application.
- D. All adhesives, cements, and mastics shall be compatible with materials applied and shall not attack materials in either wet or dry state.
- E. Install insulation using professional insulators who have adequate experience and ability.
- F. Exposed-to-view insulation shall have a well tailored appearance.
- G. Treat insulated pipe in equipment rooms and where exposed to normal view, so surfaces may be painted with water base latex paint. Use of mastics, adhesives, or jacketing which cause "bleeding" is prohibited.

3.2 INSTALLATION OF PIPE AND EQUIPMENT COVERING

- A. Where fiberglass or flexible tubular insulation is used on piping sized 2 inches and larger, insert a section of foamglass insulation at hanger or support points between pipe and metal shield for full length of shield to prevent crushing of insulation. Insulation thickness to be same as adjoining insulation. Where insulation passes through pipe hangers and across trapeze supports, 12 inches long metal saddles shall be used. On cold pipe, vapor barrier should be carried through the hanger and sealed.
- B. Apply flexible tubular insulation to pipe and fittings using the slip-on method with all joints tightly fitted and sealed with Armstrong 520 adhesive or approved equal. Seal butt joints, miter joints and torn or damaged insulation with adhesive.
- C. Apply PVC insulated fitting covers and precut insulation inserts as follows:
 - 1. Installation for hot systems:
 - a. Place the precut fiberglass insert around the fitting, positioning the points of the insert on the inside radius of the elbow.
 - b. Butt the ends of the fiberglass insert against the ends of the pipe covering. Tuck and fold the insulation so that it covers all bare surfaces. Keep the fiberglass fluffed up to the thickness of the adjacent pipe insulation to assure maximum thermal efficiency.
 - c. Insert two stainless steel serrated tacks approximately 1/4" from one of the lap edges of the fitting cover. Then snap the cover in place over the fiberglass insulation.
 - d. After the fitting cover is in position, push the tacks into the overlapping throat seam. Apply color-matched, pressure-sensitive tape to the butt joints.
 - 2. Installation for cold systems:
 - a. Position, tuck, and fold the fiberglass insulation insert as described above in steps (a) and (b) for hot systems.
 - b. Apply a vapor barrier mastic around the edges of the adjoining pipe insulation. Apply the mastic along the inside of the fitting cover throat overlap seam.
 - c. Place the fitting cover over the insulation, lapping the mastic-covered edge over the other side of the throat seam.
 - d. Apply color-matched, pressure-sensitive tape over the circumferential joints. The tape should extend over the adjacent pipe insulation and overlap itself by at least 2" on the downward side of the lap.

END OF SECTION

SECTION 22 11 16

DOMESTIC WATER PIPING AND VALVES

PART 1 - GENERAL

1.1 SYSTEM REQUIREMENTS

- A. Submit pipe, valves, and fittings and have approved before starting installation. Pipe, valves, and fittings to be new, manufactured domestically, and marked clearly with manufacturers' name, weight, and classification or working pressure.
- B. Piping to run approximately as shown on drawings or as structural and architectural conditions permit.
- C. Provide seismic support and bracing of all piping systems in accordance with Seismic Specification Section 22 0547 Seismic Restraint of Plumbing Equipment and Suspended Utilities.
- D. All products used for dispensing potable drinking water must be lead free and meet the requirements of NSF 61 and NSF 372 test standards via third party testing and certification.

PART 2 - PRODUCTS

2.1 COPPER PIPES

- A. Type "L" hard-drawn seamless copper tubing, ASTM B-88: Domestic hot and cold water 4 inches O.D. and smaller.
- B. Type "K" hard-drawn seamless copper tubing:
 - 1. Domestic water lines located under slab.
 - 2. Exterior domestic water lines 2-1/2 inches and smaller underground.
- C. Copper Pipe Fittings:
 - 1. Provide sweat fittings, ASTM B-62, dimensions conforming to ANSI B16.22, wrought copper, with sweep patterns for copper tubing.
 - 2. Dielectric connection: Provide Epco Sales, lead free dielectric couplers at junction of steel pipe and equipment with copper piping systems. Use of steel or cast iron fittings in copper piping systems prohibited. T-drill branch tee connections shall not be allowed for domestic water piping.
- D. Unions to be brass ground joint, 250-pound working pressure.
- E. Nipples used in conjunction with copper pipe to be brass.

- F. Valves are specified by Manufacturer and Model Numbers to establish quality levels unless otherwise noted. Crane, Milwaukee, Hammond, Nibco, Stockham, Centerline, Apollo, Kitz, or Watts are considered equal manufacturers. Provide clamp lock hand lever operators on valves less than 8 inches. Provide hand wheel and closed housing worm gear on valves 8 inches and larger unless indicated otherwise below. Provide chain operators for all equipment room and powerhouse valves 4 inches and larger which are located over 6 feet 6 inches above the finish floor. All valves shall meet NSF-61 requirements.
1. Ball Valves:
 - a. Ball valves for copper water piping systems 2 inches O.D. and smaller to be equal to Apollo "3" S-585-66LF, solder ends, and for 2-5/8 inches thru 3-1/8 inches O.D. to be equal to Nibco T-585-66LF, threaded ends. Valves to have bronze body, chromium plated bronze ball, PTFE seats, stuffing box ring and seals, and quarter turn on-off. Provide memory stops for valves used for balancing service. Valves to be rated for 400-psi WOG at 200 degrees F. Install threaded end valves with lead free brass adapters.
 - b. Ball valves for copper water piping systems to be T-585-66LF threaded ends with bronze body chromium plated bronze ball, PTFE seats, stuffing box ring, and seals, and quarter turn on-off. Provide memory stops for valves used for balancing service. Valves to be rated for 400-psi WOG at 200 degrees F. Install threaded end valves with lead free brass adapters.
 2. Check Valves:
 - a. Check valves for copper water piping systems to be swing type, Class 125, bronze body, screwed ends, Nibco T-413-Y-LF.
 - b. Check valves for steel water piping systems to be Nibco-910 LF Silent Check Valve. Body to be iron with bronze disc plates. Stem to be 316 stainless steel, seat to be EPT. Valve to be suitable for 200 psi working pressure at 200 degrees F.

2.2 STRAINERS

- A. Provide cleanable "Y" type strainers in pump suction lines. Strainers to have iron body with screwed bronze or bolted iron cap. Strainer baskets to be brass. Water strainers to be Monel 20 mesh screen. Strainers to be line size complete with blow-down hose bibbs. When Suction Diffusers are specified for end suction pumps, strainers are not required. Strainers to be as follows:
1. Flanged 125# - Watts LFS 77F-D1-125.

2.3 HANGERS

- A. Seismic application: The use of single-sided or friction type C-clamps with retention straps for hanging pipe is expressly prohibited on the project unless authorized by seismic bracing design engineer. Refer to Section 22 0547 for requirements.
- B. Non-insulated steel piping 1/2 inch thru 24 inches with no longitudinal movement to be Grinnell Figure 260, MSS SP-69 Type 1, adjustable clevis hanger.

- C. Insulated steel piping 1/2 inch thru 24 inches, galvanized piping 1/2 inch thru 24 inches, copper piping 1/2 inch O.D. thru 4 inches O.D., with no longitudinal movement to be Grinnell Figure 260, MSS SP-69 Type 1, adjustable clevis hanger with Figure 167, MSS SP-69 TYPE 40, galvanized steel insulation protection shield sized for maximum 10'-0" span on 4 psi compressive strength insulation.
- D. Non-insulated copper tubing 1/2 inch O.D. thru 4 inches O.D. with no longitudinal movement to be Grinnell Figure CT-99C, MSS SP-69 TYPE 9, plastic coated adjustable tubing ring hanger.
- E. Insulated steel piping 1 inch thru 30 inches with longitudinal movement to be Grinnell Figure 171, MSS SP-69 TYPE 41, pipe roll complete with Figure 160, MSS SP-69 TYPE 39A or 39B, pipe insulation protection saddle sized for proper pipe size and insulation thickness.
- F. Insulated copper piping 1/2 inch O.D. thru 2-1/8 inches O.D. with longitudinal movement to be Grinnell Figure 171, MSS SP-69 TYPE 41, pipe roll complete with Figure 167, MSS SP-69 TYPE 40, galvanized steel insulation protection shield sized for maximum 10' span on 4 psi compressive strength insulation.
- G. Support copper pipe risers by Grinnell Figure CT-121C, MSS SP-69 TYPE 8, plastic coated riser clamps at floor penetrations.
- H. Support steel pipe risers by Grinnell Figure 261, MSS SP-69 TYPE 8, riser clamps at floor slab penetrations.
- I. Support three or more parallel lines by trapeze hangers utilizing Unistrut channel or equal in bottom mounting arrangement with rod hanging support.
- J. Adequately size hangers on insulated piping for insulation to pass continuously through hangers. Insulated piping to be supported outside insulation covering.
- K. Provide concrete inserts, Grinnell Figure 282, MSS SP-69 TYPE 18, universal concrete insert, for attaching hangers to building structure. Inserts to be adequately sized and correctly positioned to support piping, valves, etc., when full of water and system is in operation.
- L. Provide C-clamps with locknut, Grinnell Figure 86, MSS SP-69 TYPE 23, where piping is to be hung from steel beams. Welding hanger rods to steel members is not permitted. Provide malleable beam clamps, Grinnell Figure 218, MSS SP-69 TYPE 30, with extension piece, Grinnell Figure 157, where piping is hung from bar joist.
- M. Attention is called to pipe spring isolation specified to be furnished by this Contractor.
- N. Support all piping by heavy steel, adjustable hangers, or brackets suitably fastened to structural portion of building. Place hangers in accordance with following tables.

STEEL PIPE SUPPORTS	
SIZE (IN.)	DISTANCE BETWEEN SUPPORTS (FT.)
4 - 6	14
8 - 12	16
14 - 24	20

COPPER TUBING SUPPORTS	
SIZE (IN.)	DISTANCE BETWEEN SUPPORTS (FT.)
5/8	6
7/8 - 1-1/8	8
1-3/8 - 2-1/8	10
2-5/8 - 5-1/8	12
6-1/8 - 8-1/8	14

- O. Perforated metal, strap iron, or band iron hangers are not permitted. Offsets in hangers are not allowed. Pipe risers to be supported at regular intervals in pipe shafts within the limits of good practice.
- P. See Insulation Section for requirements at pipe hangers.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install piping not to interfere with opening of doors or other moving parts. Do not install piping near or directly over any portion of electrical equipment.

3.2 FIRE-RATED PARTITIONS

- A. Provide permanent firestop system at all piping penetrations of fire-rated walls and floors. Review details on drawing as well as this specification for permissible firestop systems. The firestop system shall have been tested and approved in accordance with ASTM E119 and U.L. 1479 (ASTM E814) and classified for up to 2 hours fire rating. Firestop system shall be type detailed on drawings or intumescent type capable of expanding up to 8 times its original volume. Firestop system to be 3M, Hilti, Nelson, Johns Manville, or Specified Technologies. Firestop system shall be installed in strict accordance with published U.L. approved installation instructions. Piping to pass through the fire-rated partition insulated or non-insulated as specified and detailed. Submit U.L. approved installation drawing for each type of penetration prior to construction.

3.3 NON-RATED PARTITIONS

- A. Piping to pass through the walls insulated or non-insulated as specified. Wall should be finished to fit neatly around the piping. Firestopping is not required at non-rated partitions

3.4 PIPE SLEEVES

- A. Pipe sleeves shall be provided at non-rated partitions and floor penetrations. Pipe sleeves to be Schedule 40 or 18 gage steel. Sleeves to extend 1-1/2 inches in excess of partition depth on each side. Sleeves penetrating floors in wet areas, including all mechanical rooms, shall extend a minimum of 1 inch above the floor.
 - 1. Piping requiring sleeves: Copper pipes thru masonry walls
- B. Provide chromium-plated escutcheon plates for exposed uninsulated pipes projecting through floors or walls in finished spaces. Mechanical rooms and janitor closets are not considered "finished" spaces.
- C. Hang piping so equipment, flanges, and connections do not bear weight of piping.
- D. Adequately support vertical lines at their bases or by a suitable hanger placed in horizontal line near riser or by a base fitting set on pedestal.
- E. Pipes not to be hung or supported by pumps. No torque to be applied to pumps by connecting pipes. After final pipe adjustments and initial operation of the pumps, this Contractor to recheck alignment of pumps and realign as required.
- F. Run piping in straight lines; riser lines to be plumb with such offsets only as indicated or necessary. No sagging of lines permitted.
- G. Unless otherwise shown on drawings, lines to be installed to drain to sumps or sewer.
- H. Ream pipe after cutting to full bore. Remove foreign matter from inside of pipe before installing. Keep installed piping free from dirt and scale and protect open ends from foreign matter. Use temporary plugs or other approved methods of open end closure.
- I. Threads to be right-hand, pipe standard, clean cut, full depth, and tapered. Joints to be made tight without caulking. Approved pipe joint lubricant to be used, applied in thin layer to the male thread only.
- J. Install copper fittings with suitable flux and silver solder with a melting temperature of at least 1000 degrees F. Type K copper pipe to be joined by means of suitable flux and silver or phos-copper.
- K. Piping to have sufficient number of flanges or unions for convenient installation and removal of piping and equipment.
- L. Remake or replace defective, leaking, or otherwise unsatisfactory joints or material. Peening, caulking, or doping of piping is not permitted.
- M. Install piping to prevent stresses and strains to piping and hangers from expansion or contraction. Provision for proper loops, offsets, or expansion joints to be responsibility of Contractor. Make provision for servicing and removal of equipment without dismantling piping.

3.5 PIPING IN TRANSFORMER, ELECTRICAL, AND ELEVATOR EQUIPMENT ROOMS

- A. Refer to drawings. No water piping permitted in transformer, electrical, or elevator equipment rooms.

3.6 VALVE ACCESS

- A. Locate all shutoff and control valves for easy access and operation. Where valves must necessarily be located in enclosed spaces, they shall be provided with access panels of sufficient size for operation. Furnish these access panels to proper trades for installation.

END OF SECTION

SECTION 22 13 16

SANITARY WASTE AND VENT PIPING



PART 1 GENERAL

1.1 WORK INCLUDED

- A. Submit pipe and fittings and have approved before starting installation. Pipe and fittings to be new, manufactured domestically, and marked clearly with manufacturers' name, weight, and classification or working pressure.
- B. Piping to run approximately as shown on drawings or as structural and architectural conditions permit.
- C. Provide seismic support and bracing of all piping systems in accordance with Seismic Specification Section 22 0547 Seismic Restraint of Plumbing Equipment and Suspended Utilities.

PART 2 PRODUCTS

2.1 CAST IRON SOIL PIPE

- A. Standard weight cast iron soil pipe with drainage fittings:
 1. Waste, drainage, and vent lines 2 inches and larger. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute  and listed by NSF® International.
 2. Drain lines under concrete or other paving and under buildings, including to a distance of not less than 5'-0" from building. All pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute  and listed by NSF® International.
 3. Manufacturers: Charlotte Pipe and Foundry, Tyler Pipe, AB&I Foundry.
 4. Joints in cast iron soil pipe may be hub and spigot with neoprene compression gaskets conforming to ASTM C564 or "No-hub". No-hub shall not be permitted on underground systems. No-hub couplings shall be standard CISPI 310 couplings manufactured with 300 series stainless steel and neoprene rubber sleeve.
 5. No-hub couplings shall be heavy-duty as manufactured by Husky HD 2000 or Clamp-All 80. Coupling shall be constructed of stainless steel type 304, 26 gauge or thicker, with neoprene rubber gasket, ASTM C564. Install per manufacturer's torque requirements. Heavy-duty couplings shall be installed at the lower two floors of construction, and at the base of all rainwater, sanitary waste, and vent stacks.

2.2 HANGERS

- A. Seismic application: The use of single-sided or friction type C-clamps with retention straps for hanging pipe is expressly prohibited on the project unless authorized by the seismic bracing design engineer refer to Specification Section 22 0547 for requirements.

- B. Non-insulated steel piping 1-1/2" and smaller with no longitudinal movement to be Grinnell Figure 260, MSS SP-69 Type 1, adjustable clevis hanger.
- C. Non-insulated cast iron soil pipe thru 8" to be Grinnell Figure 104, MSS SP-69 TYPE 6, adjustable swivel ring, split ring type, and pipe 10" thru 15" Grinnell Figure 260, MSS SP-69 TYPE 1, adjustable clevis hanger.
- D. Non-insulated PVC pipe 1/2" O.D. thru 4" O.D. with no longitudinal movement to be Grinnell Figure CT-99C, MSS SP-69 TYPE 9, plastic coated adjustable tubing ring hanger.
- E. Support PVC pipe risers by Grinnell Figure CT-121C, MSS SP-69 TYPE 8, plastic coated riser clamps at floor penetrations.
- F. Support steel pipe risers by Grinnell Figure 261, MSS SP-69 TYPE 8, riser clamps at floor slab penetrations.
- G. Support three or more parallel lines by trapeze hangers utilizing Unistrut channel or equal in bottom mounting arrangement with rod hanging support.
- H. Adequately size hangers on insulated piping for insulation to pass continuously through hangers. Insulated piping to be supported outside insulation covering.
- I. Provide concrete inserts, Grinnell Figure 282, MSS SP-69 TYPE 18, universal concrete insert, for attaching hangers to building structure. Inserts to be adequately sized and correctly positioned to support piping, valves, etc., when full of water and system is in operation.
- J. Provide C-clamps with locknut, Grinnell Figure 86, MSS SP-69 TYPE 23, where piping is to be hung from steel beams. Welding hanger rods to steel members is not permitted. Provide malleable beam clamps, Grinnell Figure 218, MSS SP-69 TYPE 30, with extension piece, Grinnell Figure 157, where piping is hung from bar joist.
- K. Attention is called to pipe spring isolation specified to be furnished by this Contractor.
- L. Support all piping by heavy steel, adjustable hangers, or brackets suitably fastened to structural portion of building. Place hangers in accordance with following tables.

STEEL PIPE SUPPORTS	
SIZE (IN.)	DISTANCE BETWEEN SUPPORTS (FT.)
1-1/4	8
1-1/2	10

PVC AND CAST IRON SUPPORTS
Support each fitting, at intervals of not more than 5 feet, and at least at each joint.

- M. Perforated metal, strap iron, or band iron hangers are not permitted. Offsets in hangers are not allowed. Pipe risers to be supported at regular intervals in pipe shafts within the limits of good practice.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install piping not to interfere with opening of doors or other moving parts. Do not install piping near or directly over any portion of electrical equipment.

3.2 FIRE-RATED PARTITIONS

- A. Provide permanent firestop system at all piping penetrations of fire-rated walls and floors. Review details on drawing as well as this specification for permissible firestop systems. The firestop system shall have been tested and approved in accordance with ASTM E119 and U.L. 1479 (ASTM E814) and classified for up to 2 hours fire rating. Firestop system shall be type detailed on drawings or intumescent type capable of expanding up to 8 times its original volume. Firestop system to be 3M, Hilti, Nelson, Johns Manville, or Specified Technologies. Firestop system shall be installed in strict accordance with published U.L. approved installation instructions. Piping to pass through the fire-rated partition insulated or non-insulated as specified and detailed. Submit U.L. approved installation drawing for each type of penetration prior to construction.

3.3 NON-RATED PARTITIONS

- A. Piping to pass through the walls insulated or non-insulated as specified. Wall should be finished to fit neatly around the piping. Firestopping is not required at non-rated partitions.
- B. Provide chromium-plated escutcheon plates for exposed uninsulated pipes projecting through floors or walls in finished spaces. Mechanical rooms and janitor closets are not considered "finished" spaces.
- C. Hang piping so equipment, flanges, and connections do not bear weight of piping.
- D. Adequately support vertical lines at their bases or by a suitable hanger placed in horizontal line near riser or by a base fitting set on pedestal.
- E. Pipes not to be hung or supported by pumps. No torque to be applied to pumps by connecting pipes. After final pipe adjustments and initial operation of the pumps, this Contractor to recheck alignment of pumps and realign as required.
- F. Run piping in straight lines; riser lines to be plumb with such offsets only as indicated or necessary. No sagging of lines permitted.
- G. Unless otherwise shown on drawings, lines to be installed to drain to sumps or sewer.

- H. Ream pipe after cutting to full bore. Remove foreign matter from inside of pipe before installing. Keep installed piping free from dirt and scale and protect open ends from foreign matter. Use temporary plugs or other approved methods of open end closure.
 - I. Threads to be right-hand, pipe standard, clean cut, full depth, and tapered. Joints to be made tight without caulking. Approved pipe joint lubricant to be used, applied in thin layer to the male thread only.
 - J. Piping to have sufficient number of flanges or unions for convenient installation and removal of piping and equipment.
 - K. Remake or replace defective, leaking, or otherwise unsatisfactory joints or material. Peening, caulking, or doping of piping is not permitted.
 - L. Install piping to prevent stresses and strains to piping and hangers from expansion or contraction. Provision for proper loops, offsets, or expansion joints to be responsibility of Contractor. Make provision for servicing and removal of equipment without dismantling piping.
- 3.4 PIPING IN TRANSFORMER, ELECTRICAL, AND ELEVATOR EQUIPMENT ROOMS
- A. Refer to drawings. No water piping permitted in transformer, electrical, or elevator equipment rooms.
- 3.5 GRADES AND ELEVATIONS
- A. Uniformly grade sanitary drainage lines to elevations shown. If no elevations are given, pitch sewers not less than 1/8" per foot.

END OF SECTION

SECTION 22 42 13 COMMERCIAL PLUMBING FIXTURES

PART 1 - GENERAL

1.1 MANUFACTURERS

- A. Provide plumbing fixtures and drains as listed on drawings and described herein. Fixture numbers are Kohler products. Equal fixtures by Zurn, American Standard, or Crane will be considered equivalents.
- B. All drainage products to be Josam, Zurn, J.R. Smith, MIFAB, Wade or Watts. All drains installed above slab to be complete with clamping device.
- C. Stainless steel sinks shall be Just, Elkay, or Kohler.
- D. Flush valves shall be Zurn-AV or Sloan Royal, no exceptions.
- E. Pressure balancing shower valves shall be Symmons, Leonard (Pam II), or Powers Hydro Guard T/P 700 series.
- F. Commercial or public faucets shall be Zurn, Chicago Faucets, Symmons, Kohler, American Standard, or Speakman.
- G. Gooseneck faucets shall be Zurn, Chicago Faucet, T & S, Kohler, American Standard, or Speakman.
- H. Fixture supplies, stops, and traps to be commercial grade McGuire, E.B.C., Zurn, or approval equal. Traps to be 17 gauge with wall flange. Supplies and stops to be heavy pattern with wheel handle unless noted otherwise.
- I. Water closet seats shall be Bemis, Church, Kohler, Beneke, or Olsonite.
- J. Thermostatic mixing valves shall be Symmons, Holby, Powers, or Leonard.
- K. China or enamel fixtures to be white color, unless otherwise noted.
- L. All wall-mounted lavatories shall be capable of supporting a minimum vertical load of 250 pounds. Install wall-mounted lavatories with floor-anchored carriers which fit in standard stud walls.
- M. All products used for dispensing potable drinking water must be lead free and meet the requirements of NSF 61 and NSF 372 test standards via third party testing and certification.

PART 2 - PRODUCTS

2.1 FIXTURES

- P-1 Electric Water Cooler, Barrier-Free with Bottle Filling Station:
Elkay EZH2O with stainless steel finish
Zurn ZH8822 stop
Zurn Z8700 p-trap
Install above finished floor at the ADA requirement height.

PART 3 - EXECUTION

3.1 REQUIREMENTS

- A. Water closets shall be installed complete with wall carriers, wax rings, bolt caps, and flush valves (or float valves).
- B. Elevated vacuum breakers, where specified, shall be installed 7'-6" above the finished floor.
- C. Countertop sinks shall be installed complete with required mounting rim or clips.
- D. After installation, all fixtures shall be cleaned and labels removed. Where fixtures are in contact with walls, floors, or countertops, caulking shall be applied. Caulking shall be General Electric white silicon sanitary sealant.
- E. Water closets identified on plans as barrier free fixtures shall have the flush valves installed per American Disabilities Act. Flush valves shall have the handle installed on the wide side of the stall. Coordinate with the architectural drawings.
- F. Non pre-fabricated showers shall have chloraloy 240 brand non-plasticized chlorinated polyethylene concealed waterproofing membrane .040 inch thick. Installation shall be per manufacturers recommendations.
- G. At each floor drain installed above slab on grade, install a 36" x 36" apron equal to chloraloy 240 brand non-plasticized chlorinated polyethylene concealed waterproofing membrane, .040 inch thick, waterproofing membrane to be installed per manufacturers recommendations.

END OF SECTION

SECTION 23 01 00 GENERAL PROVISIONS OF HVAC SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide all labor, materials, tools, and services for a complete installation of equipment and systems contained in contract documents.
- B. Principal features of work included are:
 - 1. Heating, ventilating, and air-conditioning system.
 - 2. Control system including line and low voltage control wiring and conduit.
 - 3. Demolition of existing equipment, ductwork, and piping.
 - 4. Seismic bracing and anchorage for equipment, ductwork, and piping.

1.2 RELATED WORK

- A. Electrical power and interlock and control wiring and conduit.
- B. Field painting of equipment, ductwork, and piping.

1.3 GENERAL

- A. The contract documents form a guide for a complete system. Provide all items necessary to provide a complete system but not specifically mentioned, such as hangers, transitions, offsets, and drains.
- B. Layouts indicated on drawings are diagrammatical only. Coordinate exact location of equipment, ductwork, and piping to eliminate conflict with other divisions. Designer reserves right to make reasonable changes in location of equipment, ductwork, and piping prior to construction. Coordination drawings shall be submitted prior to any equipment/systems being installed to ensure that installation conflicts between trades are minimized.
- C. Should Contractor find during progress of work that in his judgment existing conditions make desirable a modification, report such item promptly to Designer for instructions. Do not make deviations from contract documents without review of Designer.
- D. Supervise all work with a competent mechanic specifically qualified in mechanical discipline.

1.4 PERMITS

- A. Secure and pay for permits, licenses, and inspections for work under this division.

1.5 CODES

- A. Comply with all pertinent local, state, and national codes. Refer to Division 01.

1.6 STANDARDS

- A. Comply with all pertinent standards. This list is provided as a convenience to Contractor and is not to be considered all inclusive.
 - 1. Sheet Metal and Air-Conditioning Contractors National Association (SMACNA).
 - 2. American Gas Association (AGA).
 - 3. Air Moving and Conditioning Association (AMCA).
 - 4. Air-Conditioning, Heating and Refrigeration Institute (AHRI).
 - 5. American Society of Mechanical Engineers (ASME).

1.7 SUBMITTALS

- A. Submit for review complete brochures and shop drawings for materials and equipment proposed in accordance with Division 01.
 - 1. Brochures: Submit complete descriptions, illustrations and specification data for materials and equipment proposed. Clearly indicate proposed items when other items are shown on same sheet. Submit samples on request and/or set up for inspection. Samples will be returned to Contractor.
 - 2. Submittals shall be submitted in line by line format. Each submittal shall be provided with a cover letter and supporting documentation indicating how the submittal meets each line of the referenced specification section. All discrepancies between the construction documents and the submitted product shall be clearly identified for engineer evaluation.
 - 3. If a product other than the basis of design is rejected by the engineer for any reason, the Contractor shall provide the basis of design product at no additional cost to the Owner.
 - 4. Shop Drawings:
 - a. Control systems.
 - b. Complete equipment, ductwork, and piping systems in equipment rooms.
 - c. Complete equipment, ductwork, and piping systems in entire building.
 - d. Underground steam distribution and chilled water system.
 - e. Owner furnished equipment rough-in layouts.
 - f. Kitchen hood and grease exhaust ductwork systems.
 - g. Firestop systems.

1.8 PROJECT MAINTENANCE MANUALS

- A. Prior to final acceptance of project, provide Owner with bound maintenance manuals in accordance with Division 01.

1.9 PROJECT TECHNICAL INSTRUCTION

- A. Prior to final inspection of project, provide technical instruction to Owner as follows:
 - 1. Field Instruction: Provide explanation of how systems and equipment are to operate during each season and during emergencies. Provide a minimum of 4 hours training.

2. Field Demonstration: Demonstrate operation and routine maintenance for systems and equipment. Provide a minimum of 4 hours training.
3. Video: Provide digital video of all field instruction and demonstration to Owner at completion.

1.10 PROTECTION

- A. Protect all materials and equipment in accordance with Division 01.
- B. The contractor must take appropriate precautions, during construction, to prevent unnecessary dust and debris from getting into air and water handling systems by covering equipment, controls and open-ended ducts and pipes as the installation progresses.

1.11 CONSTRUCTION RECORD DOCUMENT

- A. Provide construction record documents in accordance with Division 01. Keep at the project one set of drawings and daily record changes at the time they are made. Give drawings to Owner at project completion.

1.12 EXISTING SERVICES

- A. Maintain existing services in operation during construction. Coordinate and schedule all service interruptions with Owner.

1.13 OWNER NOTIFICATION

- A. Notify Owner two weeks prior to activation of central chilled water and steam service to project.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

- A. Provide materials and equipment of domestic manufacturer bearing the U.L. label when such label is available.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Coordinate work in accordance with Division 01. Coordinate locations of equipment, ductwork, and piping to eliminate conflict with other divisions.
- B. Carefully examine contract documents to be thoroughly familiar with items which require electrical, plumbing or mechanical connections and coordination.
- C. Provide proper chases and openings. Place sleeves and supports prior to pouring concrete or installation of masonry.

3.2 CUTTING AND PATCHING

- A. Repair or replace routine damage caused by cutting in performance of contract.
- B. Correct unnecessary damage caused due to installation of mechanical work.
- C. Perform repairs with materials that match existing in accordance with the appropriate section of these specifications.

3.3 FLASHING, COUNTERFLASHING, AND SEALING

- A. Flash, counterflash, and seal ductwork and piping at penetrations of roofs and outside walls.

3.4 OUTDOOR HVAC PADS

- A. Contractor shall make surface level prior to placing the unit concrete pads. Pads shall slope water away from the building. Provide weather hood at refrigerant piping entry to the building.

3.5 CONNECTION TO EQUIPMENT

- A. Rough-in and connect to sterilizers, lab equipment, kitchen equipment, and Owner furnished equipment and provide a shutoff valve and union at each connection. Provide steam strainer and steam trap for steam equipment. Operating valves and/or controls for this equipment will be provided as an integral part of the equipment. Do not rough-in until shop drawings showing rough-in locations have been reviewed by Designer.

3.6 FOUNDATIONS AND PADS

- A. Provide foundations, pads, and bases required for equipment. Provide concrete pad for exterior heat pump.
- B. Coordinate proper sizes and locations of foundations, pads, bases, anchors, supports, and other items to be built into structure.

3.7 IDENTIFICATION

- A. Identify exposed or accessible piping with stenciling contents indicating pipe contents and direction of flow on piping not more than 20 feet apart, at valves, at access panels, and at least once above each space.
- B. Contractors option to identify exposed or accessible piping with snap-on or strap-on type markers. Color code markers in accordance with ANSI. Indicate pipe contents and direction of flow on marker. Install markers on piping not more than 20 feet apart, at valves, at access panels, and at least once above each space.

- C. Color code piping exposed in equipment rooms in accordance with the following schedule. Paint to be Sherwin Williams Metaltex or approved substitute.
 - 1. Chilled water - pale green.
 - 2. Hot water - pink.
 - 3. Condenser water - blue green.
 - 4. Steam - dark orange.
 - 5. Steam condensate - light orange.
- D. Include design operating pressures in psig for steam and compressed air services.
- E. Control compressed air and buried lines need not be marked.
- F. Identify all mechanical equipment with engraved brass, aluminum, or stainless steel nameplates or tags. Use equipment names and numbers appearing in schedules on drawings. Fasten nameplates to equipment using screws. Glue or adhesive is not acceptable. Fasten tags to equipment using brass, aluminum or stainless steel chains.
- G. Identify each valve with engraved brass, aluminum, or stainless steel identification tag indicating valve service and sequential identification number. Attach tag to valve handle with brass, aluminum or stainless steel chain. Provide two bound manuals to Owner listing each valve sequentially and indicating valve manufacturer, style, size, service, normal position, and specific location for each valve.
- H. Frame and mount control diagrams and sequences in each equipment room. Use non-fading black and white prints encased in aluminum frame with plexiglass cover.

3.8 CLEANING

- A. Thoroughly clean ductwork and equipment casings before fans and filters are operated.
- B. Repair damaged factory finishes covering all bare places and scratches.

3.9 TESTING

- A. Test all installed equipment and systems and demonstrate proper operation. Correct and retest work found defective when tested.
- B. Thoroughly check piping system for leaks. Do not add any leak-stop compounds to the system. Make repairs to piping system with new materials. Peening, doping, or caulking of joints or holes is not acceptable.
- C. Conduct air or smoke test if in opinion of Designer reasonable cause exists to suspect leakage or low quality workmanship.
- D. Test compressed air piping with Nitrogen at 100 psi for two hours without leaks.
- E. Test HVAC systems water piping and steam supply and steam condensate return piping at a water pressure of 125 psig for two hours without leaks.

F. Vibration Tests:

1. Test vibration isolation system in accordance with methods and procedures described in the Testing, Adjusting, and Balancing Chapter in the latest edition of ASHRAE Applications Handbook.
2. Verify all vibration isolation systems are free floating and not short circuited by any connection between equipment and building structure.
3. Operate mechanical systems and verify visually and audibly that there is no excessive vibration or noise generated by the system.

END OF SECTION

SECTION 23 05 49

BASIC MATERIALS AND METHODS FOR HVAC

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Work required under this section of the specifications consists of basic materials and methods applicable to work under Division 23.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATION

- A. Isolate equipment as shown on drawings and as specified herein with factory-fabricated vibration isolators in accordance with recommendations in the latest edition of ASHRAE Applications Handbook. Isolators shall be manufactured by Kinetics, Mason Industries, or approved substitute. Provide isolators by a single manufacturer. Provide isolators of proper sizes and weight loading to meet the requirements. Provide isolators as follows:

- 1. Spring and rubber hangers, Kinetics Model SFH or SRH.

2.2 FOUNDATIONS AND PADS

- A. Provide foundations, pads, and bases required for equipment. Concrete to be in accordance with concrete division of specifications.
- B. Coordinate proper sizes and locations of foundations, pads, bases, louvers, anchors, supports, and other items to be built into structure.

2.3 FASTENINGS TO STRUCTURES

- A. Provide structural fastening devices for equipment, materials, piping and ductwork. Devices to be concrete inserts, expansion shields and lag bolts, and through bolts-washers-nuts. All bolted devices to use jamb nuts. Inserts to be continuous type as manufactured by Unistrut or approved substitute. Install per manufacturer's published installation instructions in lengths to suit specific application, complete with spring nuts, end caps, and plastic coated filler to prevent concrete seepage.
- B. Use of power drive "shot-pins" is permitted only for ducts 20 inches in width and smaller and single pipes 1 inch and smaller.

2.4 ACCESS PANELS

- A. Provide ceiling and wall access panels for installation by other Divisions. Coordinate locations so panels will provide proper access to equipment served. Notify Designer of proposed wall or ceiling access panel locations prior to installation of such panels. Minimum size: 24 inches by 24 inches.

- B. Panels shall be manufactured by Bilco or approved substitute. Provide panels with minimum 16 gauge steel construction with screwdriver operated locks and primer finish.
- C. Provide fire-rated panels for installation in fire-rated partitions.

PART 3 - EXECUTION - NOT USED

END OF SECTION

SECTION 23 05 93 TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Perform test and balance work by a Test and Balance Agency which is engaged solely in full time test and balance work, is a member of the Associated Air Balance Council (AABC), National Environmental Balancing Bureau (NEBB) or approved equal, and is selected and employed by the contractor.
- B. Perform test and balance in accordance with AABC or NEBB Standards.
- C. Contract to the Test and Balance Agency shall be issued by the contractor. Coordination with the agency at the job site shall be the responsibility of the contractor in order to ensure proper scheduling and operation of the systems. All correspondence (reports, letters and communications) between any parties shall have copies sent directly to the designer and contractor.
- D. The TAB agency shall review construction plans and specifications. If any discrepancies are noted which would hinder balancing, notify the designer with copy to the contractor. Make inspections of the job during construction for proper installation of the system(s) and of balancing aids in the system(s). Any discrepancies noted shall be brought to the attention of the contractor and designer. The number of inspections vary with the size and complexity of the job and shall be adequate for the purpose intended. Report ALL job visits in writing - MANDATORY.
- E. Provide test and balance for all new and replaced diffusers in the building.

1.2 RESPONSIBILITIES OF PROJECT CONTRACTOR

- A. The contractor shall:
 - 1. Provide approved Test and Balance Agency with copy of plans and specifications upon issue of construction documents.
 - 2. Have the building and HVAC systems in operational readiness for TAB work to begin.
 - 3. Correct prompt deficiencies of materials and workmanship identified as delaying completion of TAB work.
 - 4. Be responsible for any added costs to the owner resulting from his failure to have the building and HVAC systems ready or from his failure to correct deficiencies promptly.
- B. Complete operational readiness of the building requires that construction status of the building shall permit closing of doors, windows, ceilings installed, etc., to obtain projected operating conditions.

- C. Complete operational readiness of the air conditioning systems requires that the following be accomplished:
1. Air Distribution Systems:
 - a. Verify installation conforms to design. All supply, return and exhaust ducts terminated and pressure tested for leakage as required by specifications.
 - b. All volume, control, fire and smoke dampers properly located and functional. All dampers shall be fully open. MVD gradients and spin damper handles should be exposed through insulation. Dampers serving requirements of minimum and maximum outside, return and relief air shall provide tight closure and full opening, smooth and free operation.
 - c. All supply, return, exhaust and transfer grilles, registers, diffusers, terminal boxes and filters installed.
 - d. Air handling systems, units and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc., shall be sealed to eliminate bypass or leakage of air.
 - e. All fans operating at full load and verified for freedom from vibration, proper fan rotation and belt tension; heater elements in motor starters to be of proper size and rating. Check motor amperage and verify that it is under nameplate rating.
 2. Automatic Controls:
 - a. Verify that all control components are installed and functional in accordance with project requirements, including all electrical interlocks, damper sequences, temperature resets, and safeties.
 - b. Verify that pressure controllers are calibrated and control inlet vanes or variable speed motor controllers as required to maintain a stable pressure.
 - c. All controlling instruments calibrated and set for designed operating conditions.
 3. Notification of System Readiness:
 - a. After completion of the work above, the contractor shall notify the TAB firm and designer certifying that the work has been accomplished and that the building and HVAC systems are in readiness for testing, adjusting, and balancing.
- D. As part of this project contract, the contractor shall make any changes in the sheaves, belts and dampers required for correct balance as required by the TAB firm.
- E. The contractor shall provide and coordinate services of qualified, responsible contractors, suppliers and personnel as required to correct, repair, or replace any and all deficient items or conditions found during the testing, adjusting and balancing period.
- F. In order that all systems may be properly tested, balanced, and adjusted, the contractor shall operate systems at his expense for the length of time necessary to properly verify their completion and readiness for TAB.
- G. Project schedules shall provide sufficient time to permit the completion of TAB services prior to owner occupancy.

- H. The plans and specifications have indicated valves, dampers and miscellaneous adjustment devices for the purpose of adjustment to obtain optimum operating conditions, and it will be the responsibility of the contractor to install these devices in a manner that will leave them accessible and readily adjustable. Should any such device not be readily accessible, the contractor shall provide access as requested by the TAB firm. Also, any malfunction encountered by TAB personnel shall be reported to the contractor and designer and corrected by the contractor immediately so the balancing work can proceed.

1.3 QUALIFICATIONS OF THE TAB CONTRACTOR

- A. The firm shall submit six (6) completed projects of like size and scope. Provide references for each project.
- B. The test and balance firm shall submit a resume for the individual proposed to directly supervise the project. The supervisory personnel for the test and balance firm shall be certified test and balance engineers. All project managers and technicians shall be permanent, full-time employees of the agency.
- C. The test and balance firm shall submit a list of its calibrated instrumentation to perform the work.

1.4 DOCUMENTS

- A. The contractor shall furnish to the TAB firm the following:
 - 1. One set of mechanical specifications.
 - 2. Three sets of mechanical drawings.
 - 3. All pertinent addenda and change orders.
 - 4. One set of control submittal drawings.
 - 5. Approved submittal data on equipment installed, and related changes as required to accomplish the TAB test procedures outlined below.

1.5 SCOPE

- A. Provide test and balance of all airflows for the entire building. This shall include the new work and the existing system.

PART 2 - PRODUCTS – NOT APPLICABLE

PART 3 - EXECUTION

3.1 RESPONSIBILITIES OF THE TAB FIRM

- A. The TAB personnel shall check, adjust, and balance the components of the HVAC system which will result in minimum noise, specified temperature, and air flow conditions in the conditioned spaces of the building while the equipment of the system is operating economically. This is intended to be accomplished after the system components are installed and operating as provided for in the contract documents.

3.2 LIAISON AND EARLY INSPECTION

- A. The personnel on the job shall act as liaison between the owner, designer and contractor. They shall inspect the installation of piping systems, ductwork systems, control systems, and other component parts of the HVAC systems during the construction stage to verify proper arrangement and adequate provisions for the testing and balancing.
- B. During the balancing process, as abnormalities and malfunctions of equipment or components are discovered by the TAB personnel, the contractor shall be advised in writing so that the condition can be corrected by the contractor. The TAB firm shall suggest solutions to noted problems. Data from malfunctioning equipment shall not be recorded in the final TAB report.

3.3 THE TAB REPORT

- A. TAB activities shall culminate in a report to be provided in triplicate to the designer. The intent of the final report is to provide a reference of actual operating conditions for the owner's operating personnel.
- B. All measurements and recorded readings (of air, water, electricity, sound, etc.) that appear in the reports must be done on-site by permanently employed technicians or engineers of the firm.
- C. All comment sheets (punch lists) shall be signed by the contractor to acknowledge receipt. Any outstanding items at the time of completion shall be included in the report.
- D. The report shall be certified and approved by the firm's test and balance engineer. The report shall be recorded on standard forms.

3.4 ACTUAL TESTING AND BALANCING PROCEDURES

- A. Airside:
 - 1. Supply Air:
 - a. Fans checked for rotation, amperage, static pressure, etc.
 - b. Main supply duct pitot tube traverse and adjustment of fan speed to produce design cfm while maintaining minimum system static pressure for proper terminal box operation.
 - 2. Return Air:
 - a. Fans checked for rotation, amperage, static pressure, etc.
 - b. With supply system in the maximum mode, traverse and adjust return fan to design cfm.
 - c. With supply system in the maximum mode, proportion return inlets to within 5% of design cfm.
 - 3. Outside Air:
 - a. Fans checked for rotation, amperage, static pressure, etc.
 - b. With supply system in the maximum mode, traverse and adjust minimum outside air damper and/or fan to design cfm.
 - 4. Exhaust Air:
 - a. Fans checked for rotation, amperage, static pressure, etc.
 - b. With supply system in the maximum mode, traverse and adjust exhaust fan to design cfm.
 - c. Proportion exhaust inlets to within 5% of design cfm.

5. Diffusers, Registers, and Grilles:
 - a. Balance each supply, return and exhaust air outlet within 5% of design cfm.
 - b. Check and/or adjust pressure relationships so that each positive pressure and each negative pressure area is at least 10% positive or negative as appropriate.
6. After completion, take total air-handling system static profile and record all final statics, amperages, rpm, cfm, etc.

B. Controls:

1. Thermostats and Controllers:
 - a. Check for proper control of valves, dampers, terminal boxes, exhaust fans, etc.
 - b. Set at design set point.

C. Capacity and Performance Test:

1. Cooling Coils:
 - a. Test, set and record pressure drop and flow through each coil.
 - b. Measure entering and leaving dry and wet bulb air temperatures with glass stem, mercury thermometers accurate to 1/2 degrees F.
 - c. Measure entering and leaving water temperature with glass stem, mercury thermometer if thermometer wells are provided. If P.T. plugs are provided, use a bi-metal thermometer which reads in 1 degree F. increments and use the same thermometer for both supply and return water temperature measurements.
 - d. Record final temperatures, BTU/HR. and GPM.
 - e. Convert actual test conditions to design conditions to insure design coil capacities at design temperatures.
2. Heating Coils (Air Handling Unit and Preheat Only):
 - a. Test, set and record pressure drop and flow through each coil.
 - b. Measure entering and leaving dry and wet bulb air temperatures with glass stem, mercury thermometers accurate to 1/2 degrees F.
 - c. Measure entering and leaving water temperature with glass stem, mercury thermometer if thermometer wells are provided. If P.T. plugs are provided, use a bi-metal thermometer which reads in 1 degree F. increments and use the same thermometer for both supply and return water temperature measurements.
 - d. Record final temperatures, BTU/HR. and GPM.
 - e. Convert actual test conditions to design conditions to insure design coil capacities at design temperatures.

3.5 REPORTS

- A. Problems Encountered: Any items not installed, improperly installed or not functioning properly shall be reported to the contractor.
- B. Final Report:
 1. Any unresolved problems shall be reported in a general remarks section in front of the test and balance report.

2. Any unusual operations or pertinent remarks which may aid the maintenance personnel or ease the reading of the report shall be made in the general remarks section of the report.
3. All operating data and final tests shall be reported in the final report. This data shall include, but not necessarily be limited to the scope of work outlined above.
4. TAB contractor shall compile an Excel spreadsheet for all terminal boxes, listing each box by its unique identification number, the inlet flow area established by the box manufacturer, the manufacturer's gain factor for the box, final TAB calibrated gain factor for the box if field calibrated, and the ratio of the calibrated gain factor to the manufacturer's gain factor.

3.6 CALLBACK

- A. Test and Balance Agency shall retest any unresolved problems noted in the final report. The revised results shall be forwarded after completion of test.
- B. At the discretion of the designer before final acceptance of the TAB report, the report data shall be verified one time on the job site by selection of random check points in the presence of the designer. Representatives of the testing firm shall be present and provide the necessary equipment for test data verifications.
- C. The firm shall be responsible for testing, adjusting, balancing, and reporting on the performance of all fans, dampers, air distribution devices, pumps and heat exchangers, the flow through all coils, pumps and heat exchangers, and the power consumption of all motors. The contractors and the suppliers of the equipment installed shall cooperate with the balancing agency to provide all necessary data on the design and proper application of the system components and shall furnish all labor and material required to eliminate any deficiency.
- D. Make one (1) inspection within ninety (90) days after occupancy of the building to insure that satisfactory conditions are being maintained.

3.7 OPPOSED SEASON TESTING

- A. This service allows for testing of equipment that, due to extreme weather conditions, cannot be accurately tested at the time of the initial balance. If a project is balanced during the summer, the opposed season testing is performed during the winter months and vice-versa.
- B. During the opposed season testing, any necessary modifications to the initial adjustment required to produce optimum operation of the system components shall be made to produce the proper seasonal conditions in each conditioned space. At the time of opposite season testing, the designer and owner shall be given timely notification before any readings or adjustments are made so that he may participate.

END OF SECTION

SECTION 23 07 10 INSULATION

PART 1 GENERAL

1.1 WORK INCLUDED

- A. Contractor shall provide all necessary labor, materials, tools, and equipment to perform work required on the drawings and specified herein.
- B. Certain equipment and/or systems to be factory insulated by manufacturer. Factory insulation materials to be as specified in applicable sections of the specifications.
- C. All pipe fittings, valves, and strainers in insulated pipe systems to be insulated.
- D. Thermal resistance "R" values used herein are expressed in units of "Hour, Degrees F., Sq. Ft./BTU per Inch of Thickness" on a flat surface at a mean temperature of 75 degrees F.
- E. Note that where electric cable wrap is called for, insulation is to be applied over cable.
- F. "Contractor's Option" referred to in Materials below indicates optional materials which may be used as equals.

1.2 DEFINITIONS

- A. "Exposed" equipment, ducts, and piping are areas which will be visible without removing ceilings or opening access panels.
- B. Outdoors is considered exposed to the weather.
- C. Underground is buried, whereas in a trench below grade is considered concealed.

1.3 CERTIFICATION/QUALITY ASSURANCE

- A. Products shall meet applicable national, state, and local building codes and be U.L. (or other recognized testing lab) listed for intended service.
- B. All insulations, jackets, adhesives, coatings, sealers, and tapes shall have a flame spread rating of 25 or less and smoke development rating of 50 or less when tested in accordance with ASTM E-84, NFPA 225, U.L. 723, and further must meet the requirements of NFPA 90-A and applicable building, plumbing, and mechanical codes.
- C. All insulation materials shall be delivered and stored in manufacturers' containers and kept free from dirt, water, chemical, and mechanical damage. Under no circumstances shall insulation applied to exterior ductwork be allowed to get wet prior to final material covering.

- D. Insulation shall be applied in a workmanlike manner by experienced, qualified tradesmen.
- E. Insulation shall not be applied until all pressure testing has been completed, inspected, and released for insulation application.
- F. Surfaces shall be clean and dry.
- G. Insulation joints shall be butted firmly together and all jackets and tapes shall be smoothly and securely installed.
- H. Insulation for duct, pipe, and equipment for above grade exposed to weather outside building shall be certified as being self-extinguishing for 1 inch thickness in less than 53 seconds when tested in accordance with ASTM D-1692.

1.4 APPLICABLE CODES AND STANDARDS

- A. ASTM E-84.
- B. U.L. 723.
- C. NFPA 90-A.
- D. State of Mississippi Energy Code.

PART 2 - PRODUCTS

2.1 MATERIALS FOR PIPE AND EQUIPMENT

- A. Materials for Pipe and Equipment: Provide factory pre-molded or shop or site mitered segment type insulation for pipe, pipe fittings, and valves. Fitting insulation to be of same thickness and material as adjoining pipe insulation. All insulation and related materials such as tape and mastic to meet applicable building code requirements for fire and smoke development.
 - 1. Flexible Tubular: Provide 25/50 rated, closed-cell, flexible tubular rubber type pipe insulation. Product to have continuous operational temperature limit of 200 degrees F. and a minimum "R" value of 3.7 per inch ($K=0.27$) at 75 degrees F mean temperature. Product to be Armstrong AP Armaflex or approved equal pipe insulation. Use flexible tubular for the following services:
 - a. Moisture condensate drains: 1 inch thick.
 - b. Horizontal runs of waste lines carrying cold condensate from air conditioning equipment: 1 inch thick.
 - c. Provide multiple layers as required to obtain minimum thickness.

2.2 MATERIALS FOR DUCTS

- A. Blanket Type Duct Insulation: Provide minimum 3/4 pound per cubic foot density, flexible blanket fiberglass duct insulation with FSKL aluminum foil vapor barrier facing and 2" tab. Insulation shall have minimum 'R' value of 3.4 per inch ($K=0.29$) at 75 degrees F mean temperature. Product to be Manville "Microlite" or equivalent standard duct wrap by CertainTeed, Knauf, or Owens-Corning. Use blanket type duct insulation for the following:
1. Unlined heating and/or cooling supply and return air ductwork concealed from view: 2 inches thick.
 2. Unlined outside air ductwork concealed from view: 2 inch thick.

2.3 MATERIALS FOR FITTINGS, VALVES, AND SPECIAL COVERINGS

- A. Provide coverings and finishes for specific items hereinafter specified.
1. Use pre-molded insulation fabricated by the manufacturer of insulation material or shop or site mitered segment type insulation for: All pipe fittings, elbows, tees, valves, and couplings.
 2. PVC fitting covers over blanket fiberglass are NOT acceptable.
 3. Contractor's option to provide factory pre-molded one-piece PVC insulated fitting covers, pre-cut fiberglass insulation inserts, and necessary installation materials for all pipe fittings. Materials to be equal to Manville Zeston white, U.V. resistant, 25/50 rated, 20 mil thickness insulated PVC fitting covers and insulation inserts.
- B. For heat exchangers, air separators, large pipes, etc., in systems operating over 60 degrees F., when exposed-to-view inside building or in equipment rooms, cover insulation with a smoothing coat of Keane Powerhouse cement, one layer of white colored glass mesh embedded and finished with Foster 46-50 mastic or Childers CP-10 / CP-11 mastic.
- C. For pipe fittings, valves, strainers, air separators, and other irregular surfaces, in systems operating below 60 degrees F., when exposed to view inside building or in equipment rooms, cover insulation with white colored glass mesh embedded in white, fungus resistant vapor barrier coating Foster 30-80 AF. Coating shall meet ASTM D 5590 with 0 growth rating.
- D. Fabricate and install readily removable insulation caps to facilitate service and maintenance accessibility to all strainers including suction diffusers in systems operating below 60 degrees F.

PART 3 EXECUTION

3.1 GENERAL

- A. No insulation shall be cut where a hanger is located. If hangers have been installed by pipefitter tradesmen which violates this strict requirement, notify Designer immediately.
- B. Piping and ductwork systems shall be tested and found free of all leaks prior to installation of insulation covering.

- C. All surfaces shall be clean and dry when covering is applied. Covering to be dry when installed and during application of any finish, unless such finish specifically requires a wetted surface for application.
- D. All adhesives, cements, and mastics shall be compatible with materials applied and shall not attack materials in either wet or dry state.
- E. Install insulation using professional insulators who have adequate experience and ability.
- F. Exposed-to-view insulation shall have a well tailored appearance.
- G. Stop all duct coverings, including jacket and insulation, at fire and smoke dampered penetrations of partitions. "Fan-Out" or extend jacketed insulation at least 2" beyond angle frames of dampers and secure insulation to partition. Maintain vapor barrier. Where insulated duct access door is not used, install covering over damper access panel so as to be readily removable and identifiable.
- H. Treat insulated pipe and duct surfaces in equipment rooms and where exposed to normal view, so surfaces may be painted with water base latex paint. Use of mastics, adhesives, or jacketing which cause "bleeding" is prohibited.

3.2 INSTALLATION OF DUCT COVERING

- A. Apply jacketed blanket type fiberglass covering to ducts pulled snug but not so tight as to compress corners more than 1/4". Use insulation having 2" tab, or cut insulation long enough to allow for "peel off" of insulation from jacket to effect a minimum overlap of 2". Secure 2" jacket laps using equivalent of Foster 85-75 or CP-82 adhesive and staple lap with flare type staples on 2" centers. Cover standing seams, stiffeners, and braces with same insulation blanket, using 2" jacket lap and staple lap as hereinbefore outlined. Cover and seal all staples with Foster 30/80 AF, fire resistant vapor barrier coating reinforced with glass cloth.
- B. For duct 24" or wider, mechanically fasten insulation to duct bottom, using weld pins or nylon "stick-clip" base plates having self-locking coated metal or nylon discs. Locate fasteners on not over 12" centers laterally and longitudinally. Seal pins as above.
- C. For ducts more than 20" deep, mechanically fasten insulation to duct sides, using one row of pins, plates, or discs located on not over 12" centers longitudinally and equidistant laterally between duct top and bottom. For ducts over 24" deep, apply fasteners as before only using minimum of two rows.
- D. Apply jacketed board type fiberglass covering to ducts using weld pins or nylon "stick-clip" base plates having self-locking coated metal or nylon discs. Locate fasteners on not over 12" centers laterally and longitudinally. If insulation is grooved to fit around corners, in order to eliminate as many joints as possible, pin as required to hold insulation tight to duct, especially on bottom of duct. Seal pins and joints with Foster 30-80 AF reinforced with glass mesh.

- E. Cover all joints, rips, tears, punctures, disc heads, staples, or breaks in vapor barrier jacket with 4" wide woven glass fabric tape embedded in Foster 30-80 AF fire resistant vapor barrier coating. PRESSURE SENSITIVE TAPE NOT ALLOWED.
- F. Prior to application of flexible sheet insulation, thoroughly clean all metal surfaces, making sure that all dirt, scale, loose paint, plaster, and oil have been removed and that surfaces are dry. If surface has been primed, test a 2 square foot section using adhesive equivalent to Armstrong 520, Foster 85-75 or Childers CP-82 in order to determine whether solvent in adhesive will loosen or lift the primer. If primer is loosened, then remove it. When testing proves acceptable, adhere insulation with smooth side out, using thin but adequate coating of same adhesive. Follow manufacturers' instructions. Coat all butt edges of each sheet. Stagger all joints. Insulate all standing seams or flanges with same thickness of insulating material as that used on main surface. Seal all butt joints, miter joints, and torn or damaged insulation with adhesive.

3.3 INSTALLATION OF PIPE AND EQUIPMENT COVERING

- A. Where fiberglass or flexible tubular insulation is used on piping sized 2" and larger, insert a section of foamglass insulation at hanger or support points between pipe and metal shield for full length of shield to prevent crushing of insulation. Insulation thickness to be same as adjoining insulation. Where insulation passes through pipe hangers and across trapeze supports, 12 inches long metal saddles shall be used. On cold pipe, vapor barrier should be carried through the hanger and sealed.
- B. Apply flexible tubular insulation to pipe and fittings using the slip-on method with all joints tightly fitted and sealed with Armstrong 520, Foster 85-75, Childers CP-82 adhesive or approved equal. Seal butt joints, miter joints and torn or damaged insulation with adhesive.

END OF SECTION

SECTION 23 09 35 CONTROLS - ELECTRIC

PART 1 - GENERAL

1.1 SUMMARY

- A. Work Included
 - 1. Room Thermostats.
 - 2. Actuators.
 - 3. Controllers.
 - 4. Firestats.
 - 5. Smoke Detectors.
 - 6. Smoke Detector Installation.
 - 7. Valve and Damper Actuators.
 - 8. Automatic Control Dampers.

1.2 SYSTEM DESCRIPTION

- A. Provide a complete electric control system including electrical interlocks, low voltage wiring, conduit, relays, switches, and other devices as required to accomplish automatic control of the mechanical systems. Refer to drawings for details.

1.3 SUBMITTALS

- A. Complete shop drawings of entire control system.
- B. List of control valves, Cv and pressure drops.
- C. Complete wiring diagrams indicating equipment interlocks, thermostats, controllers, panels, indicators, control ranges and set points.
- D. List of control dampers, sizes and characteristics.
- E. Written sequence of operation of each control system.
- F. Equipment data sheets for all major control components including:
 - 1. Automatic Control Dampers.
 - 2. Controllers.
 - 3. Thermostats.
 - 4. Firestats.

1.4 WARRANTY

- A. At completion of final test of installation and acceptance by Designer, provide any service incidental to proper performance of control system for a period of one year.
- B. Control system herein specified to be free from defects in workmanship and material under normal use and service.

- C. If within one year from date of acceptance by Designer any equipment herein described is proven to be defective in workmanship or material, it shall be replaced or repaired free of charge to Owner.
- D. The guarantee period shall not start until sequence of operation has been demonstrated to Designer and Owner's representative and certified as acceptable to Designer.

1.5 QUALITY CONTROL

- A. All electrical devices to be UL listed.

1.6 TRAINING

- A. Contractor shall provide 8 hours of owner training for the new system.

PART 2 - PRODUCTS

2.1 ACCEPTABLE CONTROL MANUFACTURERS

- A. Barber-Colman Co.
- B. Honeywell.
- C. Robertshaw.
- D. Powers Controls.
- E. Approved equal.

2.2 EQUIPMENT

- A. Actuator-2 Position, Spring Return:
 - 1. For two position operation of dampers, valves, etc. with return to normal position upon power interruption.
 - 2. Actuator shaft rotates CW 180 degrees upon application of power. Spring returns actuator shaft CCW to original position when de-energized.
 - 3. Furnish with SPDT auxiliary end switch where required by application.
 - 4. Provide mounting bracket, crank arm and linkage as required by application.
 - 5. Two wire circuit. Refer to drawings for electrical requirements.
 - 6. Select actuators for proper torque required by application.
 - 7. Barber Colman Model MA-405, MA-418 or approved equal.
- B. Firestats:
 - 1. Furnish with adjustable setting from 75 to 165 degrees F., insertion element, and manual reset button.
 - 2. UL labeled.
 - 3. Locate in the supply, return, and exhaust ducts of each fan system below 2000 cfm and at other locations shown on the drawings.

C. Smoke Detectors:

1. Furnish and install Simplex Model 2098-9633 photoelectric type detectors suitable for duct mounting. Detectors shall be provided in the supply and return ducts to all fans above 2000 cfm and at other locations shown on the drawings.
2. Sampling tubes to have minimum length of 3/4 of duct width.
3. Locate sampling tubes a minimum of 6 duct widths downstream of any elbows or branch duct connections.

D. Automatic Control Dampers:

1. Arrow Pin Lock No. OBDAF-207 air foil type, opposed blade dampers by Arrow Louver and Damper Corp, Ruskin or approved equal.
2. Frames and blades: 1/8 inch extruded aluminum.
3. Blades: Single unit pin lock design, 6 inch maximum width, with pin lock an integral section within blade center axis.
4. Frames: Combination of 4 inch extruded aluminum channel and angle, with reinforcing bosses and groove inserts for vinyl seals.
5. Minimum size dampers to have 2 inch x 5/8 inch aluminum frames.
6. Pivot rods: 1/2 inch diameter extruded aluminum, pin lock design, interlocking into blade section.
7. Bearings: Double-sealed type with Celcon innerbearing on rod riding in Merlon polycarbonate outerbearing inserted in frames so that outerbearing cannot rotate.
8. Blade linkage hardware: Install in angle or channel frame section out of airstream. All hardware to be non-corrosive reinforced material or cadmium plated.
9. Designed rod bearing for no metal-to-metal or metal-to-bearing riding surfaces exist. Separate interconnecting linkage with Celcon bearing.
10. Dampers overlapping design with extruded vinyl seals to fit into integral ribbed groove inserts in both frames and blades.
11. Reinforce corners for dampers in excess of 10 square feet with gusset plates.
12. Leakage: Maximum of 1/2 of 1% leakage holding against 2 inch water gauge static pressure, verified by independent testing laboratory.

E. EMT Conduit: Install all control wiring associated with DDC/BAS in minimum 1/2 inch size EMT. Provide all associated couplings, connectors, and fittings. No electrical wiring and polyethylene tubing may occupy the same conduit. Separate carriers are required.

F. Thermostat: Provided by equipment manufacturer, hard-wired, wall-mounted, 7-day programmable.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Components:

1. Provide thermostats, controllers, actuators, automatic dampers, damper motors of sufficient size and torque to operate dampers properly, modulating valves, damper control linkages, and related items, necessary to accomplish control sequence shown on drawings. Install all such devices except as noted herein to the contrary.
2. Deliver automatic valves to the job site to be installed by mechanical tradesman under supervision of Control Tradesman.
3. Deliver automatic dampers to job site to be installed by mechanical tradesman under supervision of Control Tradesman.

B. Drawings and Layouts:

1. The controls contractor shall provide to the mechanical contractor complete schematic drawings for the entire control system for submittal to the Designer for approval before work shall begin.
2. Submit bulletins describing each item of control equipment or component.
3. Provide written sequence of operation of control scheme.
4. Prepare coordinated composite wiring diagram showing all interlock wiring associated with the following:
 - a. Starters
 - b. Control panels
 - c. DX refrigeration compressors
 - d. Electric controls.
5. As-built drawings to be framed under plexiglass and placed in each respective equipment room.

C. Electrical:

1. Electrical control components to be furnished to Electrical Tradesman by Mechanical Tradesman.
2. Electrical Tradesman to mount item where directed by Mechanical Tradesman.
3. Electrical Tradesman to wire and connect controls complete and in working order in accordance with approved wiring diagrams.
4. Control contractor to furnish and install all low voltage wiring (less than 120 volt) and its rigid conduit.

3.2 QUALITY CONTROL

- A. Control system to be set up and checked out by factory-trained competent technician skilled in the setting and adjustment of temperature controls used in this project.
- B. Mechanic to be experienced in type systems associated with this control system.

- C. At time of final observation, Control Contractor to demonstrate the entire sequence of operation for the systems to the Designer.
- D. At final observation, Designer to observe function of entire control system, temperature control operations, damper positions, and other functions necessary to assure that temperature control system is operating as intended by mechanical design.
- E. Final acceptance of system not to occur until sequence of operation check has taken place and certified by Designer's representative.
- F. The Control Tradesman to be responsible for returning to job during the opposite season to verify operation of control system.
- G. Designer to be given notice of this return and to accompany Control Tradesman to observe the sequence of operation.

3.3 INSTRUCTION AND ADJUSTMENT

- A. On completion of the job, the Controls Contractor shall have completely adjusted the entire control system.
- B. Controls Contractor shall arrange to instruct the Owner's representative on operation of the control system and supply him with three (3) copies of the control operating and instruction manuals.
- C. The Controls Contractor shall obtain from the Owner's representative a signed receipt that he has received the instruction manuals and complete instruction on the operation of the system.
- D. At the completion of the job, the controls contractor must submit to the Designer a letter stating that he has made final calibrations and adjustments to the system and that the Owner's operating personnel have been instructed in its use.

3.4 TRAINING

- A. Provide 8 hours of Owner training.

END OF SECTION

SECTION 23 31 10

SHEET METAL DUCTWORK - LOW PRESSURE

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Low pressure ductwork refers to systems operating at 2.00 inches w.g. total static pressure with velocities up to 2000 FPM. It is the intent of this specification to provide an installed duct system which will supply the air quantities indicated by the plans and have the lowest possible friction loss with the least possible leakage loss. Friction loss for each system shall not exceed that which is indicated in the A.C. unit schedule as external static pressure or in the fan schedule as static pressure and shall include the losses of all accessories. Friction losses shall be minimized by reduction in the number of offsets and elbows by pre-planning the duct system installation and coordination with other trades to prevent interferences. Access to all accessories requiring maintenance, service and inspection shall be maintained. Radius elbows are preferred for all turns to minimize friction, noise and vibration; and, especially, for sections having large volume or higher velocities and sections which may have turbulences.
- B. The contractor shall provide and/or construct all materials, ductwork, joints, transitions, splitters, dampers, access doors, etc., as set forth in these specifications necessary to install the Low Pressure Sheet Metal Ductwork required by the Mechanical Drawings.
- C. Low pressure ductwork shall be constructed to meet the following pressure class:
1. Supply ductwork downstream of terminal units: 1.0 inch pressure class.
 2. Supply and return duct connections to fan coil units or single zone air systems (ESP plus or minus 1.0 inch): 1.0 inch pressure class.
 3. Supply and return duct connections to fan coil units or single zone air systems (ESP plus or minus 1.0 inch, plus or minus 2.0 inches): 2.0 inches pressure class.
 4. Exhaust and return ductwork (Fan ESP plus or minus 2.0 inches): 2.0 inches pressure class.

1.2 QUALITY CONTROL AND REGULATORY STANDARDS

- A. SMACNA Manual: Sheet Metal Tradesman is to have access on the construction site to the Latest Edition of SMACNA "HVAC Duct Construction Standards", (Metal and Flexible). The Manual is referred to in specifications for required construction methods and details. Contractor shall comply with provisions of the SMACNA Manual and more stringent requirements of this specification.
- B. Quality control involves not only the general performance requirements for all air ducts, but also quality workmanship which includes layout preplanning so that offsets, rises, falls, elbows, fittings, etc., are minimized or eliminated. General performance requirements for all ducts include:
1. Dimensional stability (shape deformation and strength).
 2. Containment of the air being conveyed (leakage control).

3. Vibration (fatigue and appearance).
 4. Noise (generation, transmission or attenuation).
 5. Exposure (to damage, weather, temperature extremes, flexure cycles, wind, corrosive atmospheres, biological contamination, flow interruption or reversal, underground or other encasement conditions, combustion, or other in-service conditions).
 6. Support (alignment and position retention).
 7. Seismic restraint is applicable.
 8. Thermal conductivity (heat gain or loss and condensation control).
- C. Provide galvanized duct materials which meet applicable requirements of SMACNA manual and local and state codes, whichever is the most stringent.
- D. Support ductwork in accordance with applicable requirements of SMACNA manual, local and state codes, and details on plans, whichever is the most stringent.
- E. Emboss fittings with material gauge, manufacturer, and type material.
- F. Ductwork shall be installed to comply with the roof ceiling assembly for this project shown on Architectural Drawings, in accordance with the UL Fire Resistance Index Catalog.
- G. Materials used as sealers, liners, pre-insulated jackets and flexible ducts shall comply with a flame spread rating of 25 or less and a smoke developed rating of not over 50.
- H. Joint sealer shall meet the requirements of UL181A or UL181B as applicable.
- I. Duct sealant classification: Seal all transverse joints, longitudinal joints and duct wall penetrations in accordance with SMACNA Class A.

1.3 SUBMITTALS AND SHOP DRAWINGS

- A. Submit material/product data to designer for approval ONLY when it deviates from products specified in Part 2 herein.
- B. Shop Drawings: Contractor to submit to owner for approval complete sheet metal shop drawings of all ductwork, including equipment rooms, shafts, and especially congested areas and areas with possible conflicts. No installation shall proceed without owner stamped approval of shop drawings. Submittal to reflect space requirements coordinated with other trades such as Electrical, Plumbing, Mechanical and Structural. Prior to submission to owner, shop drawings to have stamped approval of all major trades which occupy ceiling space (HVAC, plumbing, piping, sprinkler, and electrical), to substantiate adequate coordination as to space, accessibility and to ensure no conflict exists between contractors.
- C. The General Contractor shall be responsible for coordination between trades and shall stamp and sign the duct drawings to substantiate that the coordination has been accomplished. Non-critical piping and conduit shall give way to ducts.
- D. Provide grease duct and kitchen hood shop drawings for review of code officials.

PART 2 - PRODUCTS

2.1 MATERIAL

- A. Sheet Metal, Angles, Bar Slips, Hangers, and Straps: Galvanized steel.
- B. Screws: Cadmium plated.
- C. Joint Sealer: Manufactured by Hardcast, Inc., Two-Stage Sealant Process.
 - 1. Stage 1: Apply fiber DT tape.
 - 2. Stage 2: Brush on RTA-50 sealant over fiber tape.

2.2 FABRICATION

- A. Provide a rectangular or round duct where required on drawings of prime quality galvanized steel sheets, thickness and reinforcement as required by the following schedule, SMACNA, or local and state codes, whichever is more stringent. When fabricating low pressure ductwork, largest duct dimension governs the entire duct and complete joint.

DUCTWORK GAUGE AND REINFORCEMENT SCHEDULE				
MAXIMUM DUCT DIMENSION (IN.)	DUCT GAUGE	SLIP GAUGE	STANDINGS	REINFORCEMENT
Up thru 18	24	24	--	--
19 - 30	24	24	1 x 24 ga.	No
31 - 42	22	22	1 x 24 ga.	No
43 - 54	22	22	1-1/2 x 20 ga.	1-3/8 x 1/8 Band Iron
55 - 60	20	20	1-1/2 x 20 ga.	1-3/8 x 1/8 Band Iron
61 - 84	20	20	1-1/2 x 18 ga.	1-1/2 x 1-1/2 x 1/8 Angle
85 - 96	18	20	1-1/2 x 18 ga.	1-1/2 x 1-1/2 x 3/16 Angle
Over 96	18	20	2 x 18 ga.	2 x 2 x 1/4 Angle

- B. Duct dimensions shown on drawings indicate inside clear dimensions. Make allowances in sheet metal size for duct requiring internal duct liner to provide "inside clear" dimensions.
- C. In addition to the requirements above, add supplemental bracing as necessary to prevent sagging, drumming, and vibration.
- D. Round prefabricated 26 gauge slip joint duct may be used on exhaust and return duct 12 inches and smaller and for runout duct to boxes, diffusers, registers, and grilles.
 - 1. Secure duct sections and fittings with sheet metal screws.
 - 2. Make connections of round duct to rectangular duct using "spin-in" collars with manual volume damper.
 - 3. Transverse and longitudinal slip joints shall be sealed with approved sealer.

- E. Provide transverse joints of "s" and drive construction at least every eight feet on duct whose larger side is less than 18". Seal all transverse joints with joint sealant material.
- F. Provide transverse joints, or equivalent supplemental angle reinforcing on 4 foot centers on duct whose larger side is greater than 18". At the contractor's option, duct mate or equal joint system may be substituted for "s" and drive construction. Seal all transverse joints with joint sealant material.
- G. Longitudinal seams shall be Pittsburg Lock or grooved seams closed tightly and evenly. Button punch snap lock longitudinal seam construction shall not be allowed. Seal longitudinal joints which prove to leak with joint sealant material.
- H. Cross break ductwork over 10" dimension, either side.
- I. Do not exceed 20 degree angle of slope for increase-in-area transitions.
- J. Do not exceed 20 degree angle of slope for decrease-in-area transitions.
- K. Do not exceed 30 degrees on the entering side or 45 degrees on the leaving side for angle of transitions at connections to equipment without the use of approved vanes. 20 degree angle is preferred and should be used space permitting.
- L. Provide Ells fabricated to one of the following specifications in order of preference (SMACNA Figures 4-2 through 4-4 and Figure 4-9 and Chart 4-1):
 - 1. Unvaned elbow with the throat radius equal to 3/4 of the width of the duct and with a full heel radius.
 - 2. Six inch throat radius with full radius, single thickness vanes and full heel radius. Maximum unsupported length of vanes shall be 36". Vanes shall be securely fastened to runners. All vanes shall be secure and stable in installed operating position. Construct vane edges to project tangents parallel to duct sides.
 - 3. Square elbows with single thickness turning vanes. Maximum unsupported length of vanes shall be 36". Vanes shall be securely fastened to runners. All vanes shall be secure and stable in installed operating position. Construct vane edges to project tangents parallel to duct sides.
 - 4. Radius elbows are the preferred fitting. Square elbows are to be used only when available space prevents the use of radius elbows.
- M. Provide offsets as necessary in accordance with SMACNA Figure 4-7.
- N. Make branch connections and tees in one of the following manners:
 - 1. Converging radius elbow with MVD. (SMACNA Figure 4-5).
 - 2. 45-degree entry with MVD. (SMACNA Figure 4-6).
 - 3. Round spin-in fitting with MVD.
- O. Space duct joints to avoid cutting them for branch take offs and outlet collars.

PART 3 - EXECUTION

3.1 INSTALLATION, APPLICATION, ERECTION

- A. Support ductwork on each side of the duct with suitable sheared strips of galvanized metal or 1 inch by 1/8 inch galvanized steel band iron hangers.
- B. Attach hangers to the ductwork using sheet metal screws.
- C. Secure hangers to concrete structure with approved anchor shields and to steel structure by means of C-clamps.
- D. Space hangers approximately eight feet along the duct except as noted below.
- E. For ducts 60 inches and larger and heavy sections, such as welded duct and sound absorbers, space hangers at approximately four foot intervals.
- F. Obstructions shall not be located within ducts.
- G. Do not exceed 45 degrees for easement transition angle.
- H. Seal all transverse joints with approved sealer in accordance with manufacturers' directions. Also, seal longitudinal joints which prove to leak.
- I. Insulation: Where drawings and insulating specifications indicate that ducts are to be insulated make provisions for neat insulation finish around damper operating quadrants, splitter adjusting clamps, access doors, and similar operating devices. Metal collar equivalent in depth to insulation thickness and of suitable size to which insulation may be finished to be mounted on duct.
- J. Counterflashing: Counterflash all ducts where they pierce the roof.
- K. Pitot Ports: Pitot ports for measuring airflow to be located in each main duct at the downstream end of the straightest run of the main and before the first branch take-off. Pitot ports to be formed by drilling 7/16" holes in the duct, lined up perpendicular to airflow on maximum 8" centers and at least three to a duct, evenly spaced. Holes to be plugged with plastic plugs. Provide access to these for future rebalancing.

3.2 CLEANING

- A. Clean ductwork thoroughly to assure all foreign matter, dirt, etc. is removed.

END OF SECTION

SECTION 23 33 10

SHEET METAL SPECIALTIES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Specialties to be submitted and approved before starting installation.
- B. Items to be installed approximately as shown on drawings taking into account differences in mechanical equipment submitted and that shown on contract documents. Each item to be installed so that it is readily accessible for maintenance, repair, and/or setting and balancing.
- C. Diffusers, registers, and grilles to have ratings certified by Air Diffusion Council and tested per ADC Equipment Test Code 1062R2 and ASHRAE Standard 36B-63.
- D. Refer to drawings for diffuser, register, and grille sizes and number of airflow directions.

PART 2 - PRODUCTS

2.1 FIRE DAMPERS

- A. Fire dampers to be U.L. listed in accordance with UL-555. Fire dampers to be held in an open position with a 165 degree F fusible link and arranged to lock in position on closure.
- B. Fire dampers for rectangular duct to be type "B" (Blades out of air stream) and for round duct to be Type "C" (Blades and frame out of air stream). Fire dampers located behind sidewall registers and grilles and others specifically indicated on drawings to be Type "A" (Frame and Blades in air stream). Fire dampers to be multi-leaf type with spring closing for horizontal mounting and weighted-gravity closing for vertical mounting. Dampers to be steel construction with rust resistant finish and provided with a factory-installed mounting sleeve suitable for structure. Mount per manufacturer's published U.L. approved installation instructions. Manufacturer models which provide square to round or round oval transitions are acceptable.
- C. See Architectural drawings for hour-rating of walls and/or floors. Dampers to be compatible with hour ratings.
- D. Fire dampers to be Ruskin Model IBD2 Curtain Type Static Fire Dampers.

2.2 DAMPERS

- A. **Manual Volume Dampers (MVD):** Manual volume dampers to be hand-operated type dampers constructed of galvanized steel, minimum 22-gauge for duct widths 18 inches and less, minimum 16-gauge for duct widths greater than 18 inches. Dampers for ducts to 12 inches height and 12 inches diameter to be single blade carried on a 3/8 inch round steel rod mounted inside of duct without frame and fitted with locking type quadrant and brass end bearing plate accurately drilled and secured to duct. Dampers for ducts greater than 12 inches height to be multi-blade type, 12 inches maximum blade width up to 30 inches blade length and 10 inches maximum blade width over 30 inches blade length. Blades to be mounted on frame with brass sleeve bearings interconnected for operation from one locking type hand quadrant. Round pivot rods to have section faced flat to receive locking setscrew in locking quadrant. Refer to SMACNA manual Figures 2-14 and 2-15.
1. For manual damper locations above a rigid or non-accessible ceiling or where damper access is limited, a remote damper operator shall be used. Damper operator to be self-locking worm gear designed for 3/8" damper shaft. Shaft extension to be 3/8 inch square rod with coupler. Remote operator to be provided with wrench operated shaft adjustment, position indication and lock nut. Where straight shaft extension cannot be used due to accessibility, a flexible cable operator with compatible damper operator and regulator may be utilized. Damper operator, shaft and regulator shall be designed for minimum 35 in-lb torque. Remote operator in non-sterile areas to be ceiling mounted with removable cover plate or mounted above access door.
 2. Ductwork manual volume damper (MVD) handles in externally wrapped ductwork shall be supplied with a stand-off bracket and locking quadrant to ensure that the handle can be adjusted without disturbing the insulation vapor barrier.
- B. **Backdraft Dampers (BDD):** Backdraft dampers to be Ruskin Model CBD6 or approved equal low-leak counterbalanced backdraft dampers. Dampers to be heavy-duty type suitable for air velocities to 2500 fpm with all extruded aluminum construction, minimum 0.81 inch thick frame, and minimum .050 inch thick blades on maximum 4 inches centers. Provide blades with vinyl edge seals. Provide dampers with aluminum linkage and corrosion resistant type bearings. Provide dampers with adjustable counterbalances on blades to assist closing.

2.3 SQUARE CEILING DIFFUSERS

- A. Provide Titus Omni or approved equal round neck, square panel face ceiling diffusers at all locations designated by schedule on drawings. Diffusers to be steel or aluminum construction. Frame to be flush mount for diffusers in "hard" ceilings and lay-in T-bar mount for diffusers in lay-in ceilings. Finish to be baked-on, off-white enamel.

2.4 LINEAR CEILING DIFFUSERS

- A. Provide Titus ML-39 or approved equal at all locations designated by schedule on drawings. Diffusers to be complete with horizontal to vertical airflow pattern adjustment. Minimum lengths of continuous border sections to be 4 feet. Slot width to be 1-inch. Total number of slots required to be indicated on drawings. Border finish to be anodized with color selected by Designer. Internal airflow pattern adjustment mechanism to be flat black. Provide each diffuser with insulated plenum with round duct connection, Titus MPI-39.

2.5 AIR LOUVERS

- A. Stationary air louvers to be extruded aluminum construction, fixed drainable blade type, Miami-Dade Qualified, Greenheck Model ESD-635D or approved equal. Louvers to be constructed of minimum 0.081" thick frame and blades. Louver depth to be 6" with equal blade spacings. Blade construction to provide built-in rainstops. Finish shall be standard natural mill. Architect will submit metal color chip to manufacturer as part of the submittal approval. Louver shall be rated at: 1,250 fpm beginning water penetration (at maximum 0.1 oz. per square foot), minimum 55% free area, 0.15 inch S.P. resistance at 1,000 fpm. Provide 1/2 inch mesh expanded aluminum screen with removable frame mounted on inside face of louver. Provide minimum 10 year finish warranty.
- B. Adjustable motor-operated louvers to be extruded aluminum construction, adjustable drainable blade type as manufactured by Ruskin, Arrow, American Warming and Ventilating, Dowco, or approved equal. Louver to be constructed of minimum 0.081 inch thick frame and blades. Louver depth to be 6 inches with equal blade spacing. Finish shall be anodized with color selected by Designer. Provide 1/2 inch mesh expanded aluminum screen with removable frame mounted on inside face of louver. Louver to include extruded vinyl blade seals and stainless steel or aluminum flexible metal compression type jamb seals for low leakage. Motor actuator to be oil immersed gear train, 120-volt line voltage type with spring return to closed position on power interruption. Provide Honeywell Model M445-845, Barber-Colman MA-5210/5330 or approved equal complete with damper linkages.

2.6 FLEXIBLE CONNECTORS

- A. Install UL listed flexible duct connectors between duct and fan/equipment connections. Flexible duct connectors to be made of 28-ounce, heavy glass fabric double coated with neoprene.

2.7 FLEXIBLE DUCT

- A. Flexmaster Type 8M or 6M Acoustical Attenuating or Approved equal. Submit acoustical performance of any alternate product for prior approval.
 - 1. Characteristics of flexible duct:
 - a. Approved as UL-181 Class 1 air duct.
 - b. Flame spread rating less than 25 and smoke developed rating less than 50.
 - c. Rated for 6 inches w.g. positive pressure, 4 inches w.g. negative pressure, and 5000 fpm air velocity.

- d. Tear and puncture resistant reinforced CPE inner liner mechanically locked together with a corrosive resistant galvanized steel helix.
 - e. Insulated with minimum 1/2" thick fiberglass insulation with vapor barrier jacket.
- B. Seal off the insulation jacket at its ends and at joints with mastic, Hardcast, or similar material. Replace flexible duct if jacket is punctured.
 - C. Flexible duct is NOT to be used for runouts where it must pass through walls or through smoke or fire partitions. Flexible duct is not to be used in exposed application. Flexible duct lengths shall not exceed 6 feet at each connection.
 - D. No bends shall be made in flexible duct with the center line radius less than one and one-half duct diameter and only one bend may occur per 6 foot length of duct material.

2.8 DUCT ACCESS DOORS

- A. Duct access doors to be provided for access to all coils, fire, fire/smoke, and smoke dampers, automatic and backdraft dampers, duct smoke detectors, static pressure and air volume sensing devices, and other equipment installed in ducts and at other points indicated on drawings.
- B. Access door construction and airtightness must be suitable for the duct pressure class used (low, medium, or high).
- C. Access doors to be double-panel, galvanized steel construction with minimum 1" rigid insulation between panels. Access doors in exhaust duct and unlined return duct may be uninsulated single panel, galvanized steel construction. Doors to mount in rigid frame constructed of formed galvanized steel. Angle iron bracing to be used as required to provide rigid assembly. Doors to hinge on one side with door latch on opposite side.
- D. Access doors in ductwork shall fully comply with Figure 2-12 and 2-13 of SMACNA manual. Casing access doors shall fully comply with Figure 6-11 and 6-12 of SMACNA manual.
- E. Doors to close against gasket seal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation to be in accordance with manufacturers' published installation instructions as well as applicable sections of SMACNA manual.
- B. Provide all screws, bolts, nuts, and inserts required for attaching sheet metal specialty items to ducts, walls, floors and ceilings.

END OF SECTION

SECTION 23 81 40 AIR-COOLED SPLIT SYSTEM HEAT PUMP

PART 1 - GENERAL

1.1 SUMMARY

- A. System to consist of fan-coil indoor unit in combination with direct-expansion air-to-air electric heat pump outdoor unit. Both indoor and outdoor unit to be UL listed and AHRI certified.
- B. Manufacturers to review the allowable space for the indoor and outdoor units considering service access, filter access, airflow clearances, and refrigerant and condensate piping to ensure adequate clearance exists for their units prior to submitting bid. Contractor shall not be allowed any extra should the low bidder prove to have unacceptable clearance.

PART 2 - PRODUCTS

2.1 INDOOR UNIT

- A. Indoor unit cabinet to be constructed of heavy gauge galvanized steel internally insulated with 1" thickness, minimum 3/4 lb. density fiberglass insulation. Indoor unit cabinet to be phosphatized and finished with baked-on enamel paint.
- B. Construct coil with aluminum plate fins mechanically bonded to copper tubing with brazed joints. Coil to be 3-row minimum.
- C. Drain pan to be welded galvanized steel and insulated.
- D. Fan to be statically and dynamically balanced, forward curved centrifugal type. Fan motor to be permanently lubricated and include internal overload protection. Provide fans with drive necessary to satisfy static pressure requirements.
- E. Provide throwaway type filter, clean and unused at the time building is turned over to Owner. Provide one spare set of filters to Owner at job completion.

2.2 OUTDOOR UNIT

- A. Outdoor unit to contain compressor with crankcase heater, automatically reversible oil pump, suction line accumulator, and internal and external motor protection.
- B. Outdoor unit fan to be vertical discharge propeller type direct driven by factory-lubricated motor.
- C. Outdoor unit coil to be constructed of aluminum fins mechanically bonded to copper tubing with brazed joints.

2.3 CONTROLS AND PROTECTIVE DEVICES

- A. Controls to include a high pressure switch, low pressure switch and pressure relief device. Compressor motor to have thermal and current sensitive overload devices. Outdoor unit to incorporate positive acting timer to prevent compressor short cycling. Device shall prevent compressor from restarting for a 5-minute period. Automatic defrost control to sense frost accumulation and defrost when necessary. A 24-volt transformer to be factory installed and wired on outdoor units for external control circuit.
- B. System control accessories shall include the following:
 - 1. Start capacitor and relay.
 - 2. Automatic changeover heating/cooling thermostat with 2-stage heating (second stage heat to be electric heat) and fan auto/on switch.
 - 3. Head pressure control for cooling operation down to 0 degrees F outdoor temperature.

2.4 SYSTEM ACCESSORIES SHALL INCLUDE THE FOLLOWING

- A. Preinsulated and precharged refrigerant piping set..
- B. Solid brass service valves.
- C. Bi-flow liquid line filter drier.
- D. Outdoor unit coil guard (louvered unit casing).

2.5 Provide unit with minimum 5-year compressor warranty.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Locate indoor and outdoor unit where shown on drawings.
- B. Install indoor fan-coil unit on neoprene in shear hangers and attach to system duct with flexible connectors.
- C. Locate outdoor unit so as to provide recommended airflow, service and maintenance clearance and mount on a 4 inch high (4 inch above grade) concrete pad.

END OF SECTION

SECTION 26 00 10

GENERAL PROVISIONS

PART 1 - GENERAL

1.1 GOVERNING CLAUSE

- A. For the sake of brevity, these specifications may omit phrases such as "Contractor shall provide", "unless otherwise indicated or specified", etc., but these phrases are nevertheless implied. Mention of materials and operations requires the Contractor to furnish, install and connect such materials and perform such operations to provide a complete and operating system to the satisfaction of the Professional.

1.2 GENERAL CONDITIONS

- A. The General Conditions, Supplementary General Conditions, Information to Bidders, General Requirements, Addenda, Alternates and other pertinent documents issued by the Professional are a part of these specifications and shall be complied with in every respect.
- B. Notwithstanding any reference in the specifications to any equipment, material or type of construction by name, make or catalog number, such reference shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may use at his option any equipment, material or type of construction which in the judgement of the Professional, expressed in writing, is equal in all respects to that specified.

1.3 RECORD DOCUMENTS

- A. The contractor shall provide to the Professional with the Close-Out Documents the following:
 - 1. Two (2) sets of hardcopy "as-built" prints of same scale as original drawings legibly marked in red showing all variations in the installed work from the requirements of the original contract drawings. The "as-built" drawings shall include all addenda, approved and installed change orders, field condition changes and other departures from the original plans and specifications.
 - 2. Three (3) sets of shop drawings and other data required by the specifications reflecting the manufacturer's shop fabrication of the materials actually installed. The Division 26 shop drawings shall be separately post bound, indexed and tabbed by specification section. Faxed or copies of faxed material shall NOT be used in Close-Out Documents.
 - 3. Operation and maintenance manuals and manufacturer's instructions for all equipment and systems installed.
 - 4. Copy of all reports of system, equipment or material test as required by this specification.
 - 5. In addition to the red-line marked blue line prints, furnish a complete set of corrected drawings on Compact Disk. Verify with the Professional prior to compiling information the required storage media, format and software revision.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.1 TEST AND OBSERVATIONS

- A. The complete project shall be, during and/or after construction, subject to the tests and observations as herein described and as noted on the drawings. Deficiencies found as a result of these tests and observations shall be corrected by the Contractor within a reasonable period and at no expense to the Owner.
- B. The complete project shall be subject to observations and tests conducted by the Professional or for him in his presence. Upon notice, the Contractor shall furnish not to exceed two men, one to include the job foreman, and tools to assist and be directed by the Professional for a reasonable amount of time to make such tests and observations as are requested by the Professional.
- C. The complete project shall be subject to observations and tests conducted by any Federal, State and/or local authority having jurisdiction. The Contractor shall make all corrections of any deficiencies required by the authority having jurisdiction to allow building occupancy.
- D. The complete project shall be subject to observations and tests conducted by the Owner's Insurance carrier. After inspection by this agency, Contractor shall make corrections of any deficiencies found adversely affecting the insurance to be carried by the Owner. Acceptance of this report or subsequent reports lie with the Professional or Owner.

3.2 GUARANTEE

- A. The Contractor shall guarantee to the Owner all work performed under this contract to be free from defects in workmanship and materials for a period of one year from the date of final acceptance by the Professional and the Owner except as hereinafter noted.
- B. The Contractor shall correct, repair and/or replace upon notice from the Owner or his authorized representative within a reasonable period of time any defects in the work performed under this contract arising during the warranty period. This repair work shall be provided at no additional cost to the Owner.
- C. Lighting luminaire lamps are hereby exempt from the one-year guarantee as follows with the exception that all lamps are to be operating upon final acceptance of the project:
 - 1. All incandescent lamps shall be warranted for thirty (30) days after the date of final acceptance by the Owner. Lamp burn-outs occurring within this time frame shall be recorded by the Owner and will be reported to the Professional at the end of this warranty period. Upon notice from the Professional, the Contractor shall furnish and install replacement lamps for each lamp burn-out reported.
 - 2. All gaseous vapor discharge lamps shall be warranted for one hundred eighty (180) days after the date of final acceptance by the Owner. Lamp burn-outs occurring within this time frame shall be recorded by the Owner and will be reported to the Professional at the end of this warranty period. Upon notice from the Professional, the Contractor shall furnish and install replacement lamps for each lamp burn-out reported.

3.3 ELECTRICAL SYSTEMS SCHEDULE

- A. Provide and connect all equipment and materials for complete and operative systems as follows:

Power Outlets & Connections to all Motors & Equipment.

Lighting & Control System.

Telecommunication System Raceways

Telecommunication Horizontal Cabling System

Fire Detection and Alarm System with Mass Notification

Miscellaneous Systems as shown on the drawings or stated herein

END OF SECTION 26 00 10

SECTION 26 00 20 CODES & STANDARDS

PART 1 – GENERAL

1.1 CODES

- A. Electrical equipment/material and their installation and connection shall strictly comply with the latest editions and applicable sections of the following listed codes and all applicable federal, state and local codes:

- National Electrical Code (NEC) - NFPA 70
 - NFPA 101 - Life Safety Code
 - National Fire Protection Association (NFPA)
 - Standard Building Code (SBC)
 - International Building Code (IBC)
 - National Electrical Safety Code (ANSI-C2)

PART 2 – PRODUCTS

2.1 GENERAL

- A. Use only NEW equipment and materials of current manufacturer. Equipment/material shall be of current production from manufacturers of long experience in the manufacture of such types of equipment/material and who are regularly engaged in the production of this type of equipment/material.
- B. Equipment/materials shall be installed and connected in strict compliance with manufacturer's recommendations unless these requirements are exceeded as noted on the drawings or specified herein.
- C. All equipment supplied shall have local service representation where applicable.
- D. Equipment and materials shall be installed and connected in a neat and workmanlike manner.

PART 3 – EXECUTION

3.1 STANDARDS

- A. All equipment/material shall be manufactured in compliance with applicable National Electrical Manufacturers Association (NEMA), American National Standards Institute (ANSI) and NEC Standards and requirements.
- B. All equipment/materials provided and connected shall be listed by Underwriter's Laboratory (UL) when such listings are issued for the type of equipment/materials. All equipment/material shall be installed and connected in full compliance with their UL listing.

END OF SECTION 26 00 20

SECTION 26 00 30

ELECTRICAL EQUIPMENT/MATERIAL SUBMITTALS

PART 1 – GENERAL

1.1 GENERAL

- A. Equipment is specified by manufacturer's name and catalog number and is intended to establish the minimum standards of quality acceptable.
- B. Where the phrase "or approved equal" is used in the Division 26 Specification, substitute equipment, equivalent in all respects to that specified, of any qualified manufacturer is permitted with the written approval of the Professional. Approval will not be considered until after award of contract and only if submitted by the successful Contractor. Where a list of manufacturers and/or catalog numbers is provided and the phrase "or approved equal" is omitted, substitute equipment, equivalent in all respects to that specified, from one of the listed manufacturers is permitted with the written approval of the Professional.
- C. The manufacturer's name and/or catalog number first mentioned in this specification is considered to be the specified equipment. The "or equal" manufacturers mentioned or other manufacturers proposed by the Contractor shall be considered as substituted equipment.
- D. Substituted equipment shall meet the dimensional and functional requirements of the building as represented by the plans and specifications. All revisions to the contract precipitated by the use of substituted equipment shall be incorporated by the Contractor, after approval in writing by the Professional, and at no additional cost to the Owner.
- E. The Professional's approval of the shop drawings is only for general conformance with the design concept of the Project and the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site; information that pertains solely to the fabrication process or to the means and methods of construction; coordination of work of all trades; and performing all work in a safe and satisfactory manner. Approval of the shop drawings does not modify the Contractor's duty to comply with the Contract Documents. Any equipment or work found in the judgement of the Professional to be defective or otherwise unsuitable shall be repaired or replaced by the Contractor at no additional cost to the Owner.
- F. If requested in writing by the Professional, the Contractor shall submit a scale drawing (scale as directed by the Professional) of any electrical equipment area, conduit layout or the like which in the opinion of the Professional may present difficulty regarding space allocation or clearances.

PART 2 – PRODUCTS

2.1 SUBMITTALS

- A. After the project notice to proceed has been issued and with promptness to assure reasonable time for review with no delay to the project, the Contractor shall submit to the Professional a minimum of six (6) copies of shop drawings for all equipment and material for the electrical systems for approval whether or not substituted equipment or materials.

- B. The Contractor shall include with his shop drawing submittals a copy of the electrical service characteristics letter required by Section 260450. Shop drawings submitted without this letter attached will not be reviewed until this letter is provided.
- C. Shop drawings shall be post-bound, indexed and tabbed per the appropriate specification sections. All material/equipment shop drawing cut sheets shall be properly located under the appropriate specification section. All shop drawings shall be originals (no faxed copies) and shall be readable without being removed from the bindings. All information listed on the shop drawings shall be typed. Handwritten information will not be accepted.
- D. Space shall be provided on the title or index page of each section of the shop drawings for the Professional's review stamp and comments. This space shall be clearly labeled as to its use and shall have a minimum size of 7" wide X 5" high.
- E. All submitted equipment/material and associated options, accessories, special features, etc. shall be clearly marked and indicated on all copies of the shop drawings. Provide appropriate shop drawings on all required accessory equipment.
- F. All shop drawings for all systems, equipment and materials including any required one-line drawings, diagrams, etc. shall be submitted together. Partial submittals will not be reviewed without prior consent. Special systems provided by specialized vendors or distributors may be submitted in a separate binder.
- G. Provide complete shop drawings with all pertinent information for the following equipment and/or systems and all required components:

Panelboards.

Circuit Breakers.

Conduits, Boxes and other Raceway Systems.

Conductors, 600V.

Required Cable Test Reports.

Switches.

Receptacles.

Miscellaneous Wiring Devices.

Lighting Luminaires and Accessories.

Luminaire Ballasts.

Luminaire Emergency Battery Packs.

Lamps.

Telecommunications Horizontal Cabling System

PART 3 – EXECUTION

NOT USED

END OF SECTION 26 00 30

SECTION 26 01 00

BASIC ELECTRICAL MATERIALS & METHODS

PART 1 - GENERAL

1.1 COORDINATION

- A. This Contractor shall familiarize himself with the general construction and building systems of all divisions specified in the Contract Documents. Fully coordinate the installation of all electrical equipment and materials with the general construction work and work of other divisions of the specifications prior to the start of the installation. Notify the Professional, prior to installation, of conflicts between electrical and structural, architectural, mechanical, etc. work.
- B. Layout and installation of Division 26 work shall be the responsibility of this Contractor and all conflicts with other trades shall be resolved by the Contractor and approved by the Professional prior to installation.
- C. Sequence, coordinate and integrate installing electrical equipment and materials for efficient flow of the work. Coordinate the installation and positioning of large equipment before closing in the building. Providing appropriate pathways, lifting devices, etc. for the installation of electrical equipment and/or materials in new or existing facilities is the responsibility of this Contractor.
- D. The electrical drawings are not to scale. Follow architectural, equipment supplier shop drawings, and manufacturer's shop and installation drawings for accuracy. Coordinate the installation of electrical devices, equipment and/or materials with the architectural drawings, features and finishes for the space where installed.

PART 2 – PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 ELECTRICAL IDENTIFICATION

- A. Electrical equipment, devices, outlets, conductors, etc. shall be properly and legibly labeled as specified herein.
- B. Conductors or wiring shall be labeled using tape markers of vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- C. Engraved plastic labels, signs, etc. shall be melamine plastic laminated punched or drilled for mechanical fasteners and shall be properly secured to associated equipment or device. Engraved legend shall be black letters on white background. Minimum label thickness shall be 1/16".
- D. Where equipment, circuit, etc. identification requires the use of building room numbers and room names, the numbers and names used shall be the final designations issued by the Professional as they appear on the building signage. These designations may or may not be as they are indicated on the Contract Drawings. The Contractor is responsible for fully coordinating the room designations with the Professional.

3.2 ELECTRICAL EQUIPMENT & MATERIAL INSTALLATION

- A. Equipment and materials shall be installed and connected in a neat and workmanlike manner.
- B. Install equipment and materials level, plumb, and parallel and perpendicular to other building systems' elements and components unless otherwise indicated.
- C. Install equipment to facilitate service, maintenance, and repair or replacement of components.
- D. Electrical equipment and devices shall be mounted at the height specified in the appropriate sections or as indicated on the drawings. Mounting heights may be adjusted slightly to permit cutting of masonry block to the top or bottom of the block course nearest the required height. All heights shall be consistently cut above or below the block coursing so that they are the same height above the reference.
- E. The mounting heights of electrical equipment and material shall reference the height above the finished floor or grade above which they are mounted. Mounting heights specified shall reference the center of the box, device, switch or circuit breaker operating handle unless indicated otherwise.
- F. Electrical switchboards, panelboards, motor control centers, disconnect switches, etc. shall be installed with the proper dedicated electrical spaces and working spaces as required by the NEC.

3.3 FIRE STOPPING

- A. Openings around electrical penetrations through smoke or fire rated wall, partition, floor or ceiling assemblies shall be smoke and/or fire stopped using an approved UL listed system designed for the materials encountered to maintain the smoke and/or fire rating of the assembly.
- B. All fire proofing in rated walls, partitions, floors or ceiling assemblies shall be performed by a certified Fire Proofing Contractor. The Division 26 Contractor shall be responsible for procuring and coordinating with the Fire Proofing Contractor to provide the required fire proofing of all electrical penetrations in or through rated assemblies.

3.4 CUTTING & PATCHING

- A. Cut, channel, chase and/or drill floors, walls, partitions, ceilings and other surfaces required to permit electrical installations. Obtain permission in writing from the Professional and the General Contractor prior to cutting or penetrating any structural member.
- B. Repair and refinish disturbed finish materials and other surfaces indoors and out-of-doors to match adjacent undisturbed surfaces and/or to existing condition prior to work performed.
- C. Use experienced and skilled mechanics of the trades involved or employ appropriate sub-contractor to perform all repair and refinishing.
- D. All roof penetrations shall be weatherproofed by the Division 7 Contractor. Division 26 Contractor shall be responsible for procuring and coordinating with the Division 7 Contractor to weatherproof all roof penetrations created by the Division 26 work.

3.5 CLEANING & PROTECTING

- A. Properly protect equipment and installations during the construction period to ensure that components, coatings, finishes, cabinets and enclosures are without damage or deterioration at the time of acceptance by the Owner.
- B. On completion of construction within an area, inspect exposed finish of outlets, devices, fixtures, equipment, etc. Remove burrs, dirt, paint spots and construction debris.
- C. Provide touch-up paint on equipment finishes marred during the construction or installation process. Paint shall be as recommended by the equipment manufacturer and shall match the installed equipment finish.

3.6 HAZARDOUS LOCATIONS

- A. All electrical equipment/devices/luminaires and associated branch circuitry located within or passing through hazardous locations as defined by the NEC shall be installed in strict compliance with Article 500 of the NEC and as shown on the drawings. Areas affected are as noted on the drawings and/or as implied by area name given on the Architectural Drawings.
- B. All wiring shall be installed in galvanized rigid steel, intermediate metal conduit or Type MI cable with proper fittings and boxes approved for installation in the hazardous location rating encountered as defined by the NEC.
- C. Seal-off fittings shall be installed where indicated on the drawings, where conduits enter/leave hazardous location boundaries and as required by the NEC. Where a seal-off fitting must occur in a finished area, it shall be installed in a flush mounted wall junction box with stainless steel cover. Where a seal-off fitting is installed in an unfinished area, it shall be surface mounted in an accessible location as directed and approved by the Professional. Seal-off fittings shall be Crouse-Hinds type EYS or approved equal with proper sealing compound installed after cable installation.
- D. All electrical equipment, devices, etc. installed within the boundaries of a hazardous location as defined by the NEC shall be specifically approved for installation and operation in the hazardous location rating encountered as defined by the NEC.

END OF SECTION 26 01 00

SECTION 26 01 10

RACEWAYS & FITTINGS

PART 1 - GENERAL

1.1 METALLIC RACEWAYS

A. General

1. All power branch circuit/feeder wiring and other systems' wiring as specified shall be in metallic conduit unless specifically noted otherwise on the drawings or herein specified.
2. Size conduits as shown on the drawings or where size is not shown follow the requirements of the NEC. Four-wire branch circuit homeruns shall be 3/4" trade size minimum. Homeruns shall not exceed the number of conductors shown on the drawings unless specific approval is given by the Professional.
3. Where conduit bends/elbows for power circuits are required to be long radius, the minimum bend radius shall be eight (8) times the conduit trade size for conduits 2" or greater and six (6) times the conduit trade size for conduits less than 2" unless otherwise directed by the Professional.
4. Conduit bends/elbows for communication systems shall be long radius type. The minimum bend radius shall be ten (10) times the conduit trade size for conduits 2" or greater and six (6) times the conduit trade size for conduits less than 2" unless otherwise directed by the Professional.
5. All conduit bends/elbows uses in conduit systems for electrical service entrances and feeders shall be long radius type unless available installation space is prohibited by the building's structural elements, construction type, etc.
6. Wiring gutters shall not be used unless specifically shown or noted on the drawings.

PART 2 – PRODUCTS

2.1 CONDUITS

- A. Conduits shall be hot-dipped galvanized rigid steel (GRS) per ANSI C80.1/UL 6, intermediate conduit (IMC) per ANSI C80.6/UL 1242 or electrical metallic tubing (EMT) per ANSI C80.3/UL 797 unless specifically shown or noted otherwise on the drawings or herein specified.
- B. Where specifically noted and/or indicated on the drawings, wiring may be installed in polyvinyl chloride (PVC) conduit per NEMA TC-2/TC-3//UL651. PVC conduit shall be sunlight-resistant, electrical grade, Schedule 40 minimum or Schedule 80 where indicated on the drawings as manufactured by Carlon, Triangle, PWC or equal approved by the Professional.

PART 3 – EXECUTION

3.1. CONDUIT MATERIAL

- A. Conduit shall be provided in accordance with the following schedule unless shown or noted otherwise on the drawings or herein specified:
 1. In suspended ceiling construction or non-masonry partitions: GRS, IMC or EMT.

2. In masonry partitions: GRS, IMC or EMT.
 3. In any poured concrete: GRS or IMC.
 4. In exposed locations indoors: GRS, IMC or EMT.
 5. In exposed locations out of doors: GRS or IMC. All conduits buried in earth shall be GRS with polyvinyl, polyethylene or asphaltum coating.
 6. All feeders shall be run in GRS or IMC.
 7. All electrical power conduits in excess of 1 1/4" trade size shall be GRS or IMC.
- B. Rigid non-metallic conduit (RNC) may be used only where specifically shown or noted on the drawings or herein specified.

3.2 FLEXIBLE CONDUIT

- A. Flexible conduit shall be steel. Use not to exceed six (6) feet of flexible metal conduit for connection to motors and/or recessed fixtures unless otherwise specified herein.
- B. Flexible conduit used for connections subject to moisture under normal conditions or where specifically indicated or noted shall be liquid-tight with proper liquid-tight fittings.
- C. All flexible conduit shall have properly sized bonding jumper installed within. The grounding conductor shall be sized as indicated or in accordance with the NEC.
- D. All final connections to motors, transformers or other vibrating equipment shall be with flexible conduit suitable for the environment installed.

3.3 INSTALATION/ROUTING

- A. All conduits shall be routed concealed above/within ceilings, wall partitions, floors, etc. unless specifically shown or noted otherwise on the drawings or stated herein.
- B. Route conduits parallel and/or perpendicular to walls, ceilings or floors weather concealed or exposed. Homerun conduits shall be combined to form a common routing path and supported from the building structure by trapeze style hangers.
- C. Conduits shall NOT be routed horizontally on the roof without specific approval from the Professional.
- D. Make field bends and offsets in conduits in accordance with the NEC and so as not to reduce the internal diameter.
- E. Install raceways with a minimum number of bends in the shortest practical distance, considering building construction and obstructions and other requirements of the drawings and this specification. Provide accessible junction/pull boxes per the NEC to limit distance between pull points to 100 feet or in conduit runs where total raceway bends exceed 360 degrees.
- F. Branch circuit, telecommunication and other systems' conduits shall not be routed in/under floor slab unless specifically shown or noted on the drawings to be installed in that manner, the adjacent building construction methods prohibit concealed overhead routing, or the nature of the connected device/box (i.e. floor boxes) requires this type of routing.

- G. Where conduits are shown or required to be concealed in concrete slabs in contact with earth, conduits 1/2" through 1" trade size shall be installed in and not under slabs. Conduits in excess of 1" trade size shall be installed under slab and shall have two coats of asphaltum paint applied or shall be coated with polyvinyl, polyethylene or other approved coatings. Where conduit symbol indicates conduit concealed in floor slab and concrete thickness is less than four (4) inches, conduits shall be installed below slab. Conduits shall be routed as required so as not to compromise the structural integrity of any concrete.
- H. Protect conduit stub-ups above floor slabs, finished grade, etc. from damage during and after the construction period. Provide temporary closures to prevent entrance of moisture or debris into conduits and make certain that conduits are clear of same before installing conductors.
- I. Pull into all empty conduits one nylon pull string with not less than 200 lb. tensile strength. Leave at least 12 inches of slack at each end.

3.4 SUPPORTS

- A. All conduits and conduit fittings shall be properly supported in accordance with the National Electrical Code and as follows:
 - 1. By one-hole or two-hole straps properly attached to the building elements.
 - 2. Where embedded in concrete, by at least three (3) rounds of #14 B&S gauge galvanized wire twisted around concrete reinforcing rods.
 - 3. For exposed work, by one-hole or two-hole malleable iron clamps held in place by machine screws in expanding lead anchors in concrete or masonry or by screws in wood.
 - 4. By conduit clamps properly attached to bar joists.
 - 5. By bulb "T" clamps for conduits crossing bulb "T"s.
 - 6. Where groups of conduits occur or for feeder conduits where applicable, by trapeze hangers adequately supported by steel rods attached to the building structure using concrete inserts, welded supports, bolted supports, etc.
- B. In suspended ceiling construction, do not support conduits from ceiling support system. Conduit and box systems shall be supported independently of both the tie wires supporting the ceiling grid system and the ceiling grid system into which ceiling panels are placed.
- C. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts unless specifically shown or noted otherwise.

3.5 CONDUIT FITTINGS/TERMINATIONS

- A. All conduit fittings shall be steel or malleable iron. Die cast fittings shall not be used.
- B. GRS and IMC conduit fittings:
 - 1. Steel or malleable iron threaded couplings, elbows and conduit bodies.

2. Bushings: Shall be the insulating type of steel or malleable iron consisting of an insulating insert molded or locked into the metallic body of the fitting.
 3. Bushing for conduits 1 1/4" or larger shall be the grounding type with a ground lug.
 4. Locknuts: Shall be bonding type of steel or malleable iron with sharp edges for digging into the metal wall of enclosures/boxes.
- C. EMT conduit fittings:
1. Couplings and connectors shall be insulated compression type of steel or malleable iron and shall be properly secured to each conduit or box.
- D. Couple conduits together and connect to boxes, fittings and cabinets so as to provide effective electrical continuity. Assure ground continuity on GRS feeder and branch circuits by two locknuts, one inside and one outside of all boxes, cabinets and enclosures. Do not use couplings dependent on screws bearing on conduit.
- E. Provide insulating bushing where conductors #4 or larger enter junction box, enclosure, cabinet or cutout box. Bushings shall be grounding type as manufactured by OZ/Gedney type "BLG", Thomas & Betts/Steel City or equal approved by the Professional.
- F. Expansion fittings in conduits shall be provided where shown on the drawings or where conduits imbedded in concrete pass through an expansion joint(s). Expansion fittings shall be as manufactured by Crouse-Hinds Type XJG with internal grounding or equal approved by the Professional.
- G. Provide seal-off fittings where shown on the drawings or as required by conditions encountered requiring seals. Seal-off fittings shall be installed where conduits are installed between areas of different temperatures where condensation may occur. These shall include, but not be limited to, refrigerators, freezers, air-handling units, environmental rooms and the building exterior. Seal-off fittings shall also be installed where conduits enter the building or a piece of equipment and there is a possibility of moisture migration thru the raceway to the equipment or into the building. Fittings shall be as manufactured by Crouse-Hinds Type EYS for horizontal and vertical runs, Type EYS elbow seals or equal approved by the Professional. All seals shall be properly installed in an accessible location using "Chico X" fiber and "Chico A" sealing compound.
- 3.6 INNERDUCT CONDUITS
- A. Where shown or noted on the drawings or herein specified, provide innerduct conduits in telecommunication system conduits, communication system conduits or other systems' conduits as shown or noted on the drawings. Innerduct conduits shall be sized as shown or noted corrugated, orange in color and shall have minimum friction resistance to cable pulling. Each innerduct conduit shall have nylon pull string installed.
- 3.7 RIGID NON-METALLIC CONDUIT (RNC)
- A. Installation of PVC conduit shall follow the applicable provisions of conduit installation/routing hereinbefore specified for metallic conduits and the manufacturer's recommendation unless exceeded by requirements shown on the drawings or this specification. All joints shall be made using approved and proper solvent cement to make all joints water tight.
 - B. Galvanized rigid steel (GRS) conduit shall be used where PVC conduit runs turn angles, rise vertically and/or are exposed.

- C. PVC conduit shall not be stored nor have been stored in direct sunlight.
- D. PVC boxes of equivalent dimension to those hereinafter specified under paragraph 26 01 20 "BOXES AND ENCLOSURES" shall be used with PVC box connectors.
- E. Where underground PVC conduits are shown and/or noted on the drawings to be used for communication systems and/or to be empty for future use, provide one No.8 copper conductor in each conduit for full length of conduit for future locating purposes.

END OF SECTION

SECTION 26 01 20

BOXES AND ENCLOSURES

PART 1- GENERAL

1.1 OUTLET BOXES

- A. Provide proper outlet box at all fixtures/devices and outlet provision locations as shown on the drawings by symbols or specified herein.
- B. All outlet boxes and raised covers shall be galvanized stamped steel unless otherwise noted on the drawings or specified herein.
- C. Close all unused knockout holes and install galvanized device cover or blank cover on surface boxes and proper device plate or blank plate as specified herein on flush boxes.
- D. Location of all outlets as shown on the drawings is approximate and representative unless dimensioned or specifically noted. See Architectural drawings, details and/or shop drawings for specific outlet locations. Any outlet/box and associated conduits/conductors may be moved from the location shown on the drawings in any direction up to a distance of ten (10) feet by direction of the Professional if so directed before the outlet/box has been installed.

PART 2 – PRODUCTS

2.1 FLUSH MOUNTED BOXES/OUTLETS

- A. Plates on all flush mounted boxes/outlets shall be satin-finished, type 302 stainless steel (18% chrome, 8% nickel) as manufactured by Hubbell or equal in Pass & Seymour, Leviton or Arrow Hart.
- B. Weather proof receptacles installed outdoors in locations protected from the weather (roofed open porches, canopies, and the like) or in other indoor damp locations shall be provided with weather proof covers as manufactured by Hubbell or equal in Pass & Seymour, Leviton or Arrow Hart. Plates shall be Cat. No. CWP8H for non-GFI type receptacles and Cat. No. CWP26H for GFI type receptacles. Weather proof receptacles installed outdoors in locations unprotected from the weather shall be provided with "in-use" type weather proof covers as manufactured by Hubbell Cat. No. WP8MHP or equal approved by the Professional.

PART 3 – EXECUTION

3.1 OUTLET BOXES

- A. Use outlet boxes at interior locations sized in accordance with the following schedule or in accordance with the NEC whichever dictates a larger box. Minimum conductor size to be used in determining power branch circuit box sizes shall be #12 AWG.
 - 1. Switch box, 3"X2"X2 1/2" - 5 conductors maximum.
 - 2. 4" octagon box, 1 1/2" depth - 6 conductors maximum.
 - 3. 4" square box, 1 1/2" depth - 9 conductors maximum.
 - 4. 4" square box, 2 1/8" depth - 13 conductors maximum.
 - 5. 4 11/16" square box, 2 1/8" depth - 18 conductors maximum.

6. 4" octagon concrete box, 2 1/2" depth - 13 conductors maximum.
- B. Use boxes of cast or malleable iron with threaded hubs for damp or wet locations, locations exterior to the building and in any poured concrete.
- C. Mount boxes flush with finished surface. Provide plaster rings or square corner raised covers for tile or block walls so that fixtures/devices/plates will be perfectly flush mounted. Do not install outlet boxes back to back. Face of boxes shall not be installed more than 1/4" behind finished face of wall.
- D. Where a single outlet box is installed in a metal or wood stud wall, the box shall be attached to the studs using a metal mounting bracket with support leg to prevent movement of box in wall at unattached side. Where two or three outlet boxes are shown and/or intended to be located adjacent to each other in a metal or wood stud wall, the boxes shall be attached to the studs using a common metal mounting bracket with bracket stabilizer leg to support the middle portion of the bracket. Outlet box mounting brackets shall be as manufactured by Erico/Caddy or approved equal.
- E. Outlet boxes installed in masonry walls shall be embedded in masonry grout so as to properly secure each box in place. The Division 26 Contractor is responsible for providing all materials and installing the outlet boxes as required.
- F. Outlet/junction boxes shall be as manufactured by Thomas & Betts/Steel City, Raco, Appleton or equal approved by the Professional.

3.2 JUNCTION/PULL BOXES

- A. Provide junction boxes or pull boxes as required by the NEC, field conditions encountered, etc. whether or not shown on the drawings. Box locations shall be fully coordinated with the Professional where boxes are to be exposed or where installation affects architectural elements, structural construction or mechanical systems.
- B. Use stamped steel boxes for indoor junction/pull boxes where the appropriate box size is available for the conduit size(s) and the number of conductors encountered. Use screw cover metallic pull boxes indoors where larger boxes are required. Use cast iron boxes out of doors.
- C. Boxes sizes shall be as indicated on the drawings, herein specified, per the NEC for the conduit sizes, conductors and situation encountered, or as directed by the Professional. Use above listed outlet box sizing schedule for stamped steel junction/pull boxes.
- D. All junction or pull boxes shall be labeled indicating system being served, branch circuit or feeder circuit identification, etc. Where installed in concealed locations (i.e. above accessible ceilings) or in unfinished areas, identification shall be made on outside of box cover. Where installed exposed in finished locations, identification shall be made on inside of box cover. Fire alarm system(s) junction box where not exposed in a finished space shall have covers painted "red" in color.
- E. Close all unused knockout holes in junction/pull boxes and install proper cover. Junction/pull boxes install flush or exposed in finished spaces shall be installed with the same requirements as outlet boxes.
- F. Junction/pull boxes shall be as manufactured by Hoffman, Columbia, Hope or equal approved by the Professional.

3.3 PLATES/COVERS

- A. Provide plates and/or covers on all boxes and outlets with or without devices. Plates shall be single, multi-gang or combination types to match corresponding devices. Securing screws shall have same finish as plate. Oversized or jumbo plates shall not be used without specific approval from the Professional.
- B. Plates shall be properly secured to outlet box with corners in contact with finished wall and oriented parallel/perpendicular to adjacent building surfaces.
- C. All surface mounted outlet/junction boxes shall be provided with galvanized steel plates.

END OF SECTION 26 01 20

SECTION 26 01 30 CONDUCTORS (600V)

PART 1 - GENERAL

1.1 GENERAL

- A. Conductors shall be standard annealed copper rated 600 volts with mechanical strength, insulation, temperature and current carrying capacity adequate for the particular conditions under which they are used and in accordance with the following:
 - 1. In wet or dry locations type "THHN-THWN" complying with NEMA WC 5 unless specifically shown or noted on drawings or specified herein to be other type.
 - 2. Branch circuit conductors within three (3) inches of a ballast within the ballast compartment of fluorescent luminaires shall be recognized for use at temperatures not lower than 90°C.
 - 3. In un-wired luminaires where required by the NEC, use approved heat-resistant wire sized for current, voltage and temperature at which luminaire operates.
 - 4. Conductors entering the self-contained ballast compartment of gaseous vapor discharge fixtures shall be rated 600 volts, #10 AWG, stranded copper, silicone rubber insulation, glass outer-braid and 200°C. rated conductor temperature.

PART 2 – PRODUCT

2.1 CONDUCTOR SIZES

- A. Conductor sizes #8 AWG and larger shall be of the stranded type with Class B stranding. Conductor sizes #10 AWG and smaller shall be of the solid type with the exception that all final connections to motors or other vibrating equipment shall be made with stranded conductors regardless of conductor size.

PART 3 – EXECUTION

3.1 BRANCH CIRCUIT CONDUCTOR

- A. Use #12 AWG minimum power branch circuit conductor size with exceptions as noted on the drawings or as stated herein. 120 volt branch circuit homerun conductors in excess of 50 feet in length and 277 volt branch circuit homerun conductors in excess of 100 feet in length of all 20 ampere branch circuits shall be #10 AWG minimum size whether or not shown or noted on the drawings.
- B. All shared neutral conductors of 20 ampere branch circuits serving receptacles shall be #10 AWG minimum.
- C. Use manufacturer approved pulling compound or lubricant where necessary. Compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage conductors or raceways.

3.2 CONNECTIONS / SPLICES

- A. Tighten electrical connections and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- C. Make splices and connections in accessible boxes, gutters or cabinets only. Conductors sizes #8 AWG and larger shall be spliced only with specific approval from the Professional.
- D. Use soldered and taped or approved mechanical splice connections on solid wire and pressure type solderless connectors well taped on stranded conductors. Conductor sizes #8 AWG and larger shall have irreversible compression type splice.
- E. Use Scotch 3M or approved equal plastic tape over mechanical and soldered splices applied in thickness equal to wire insulation.

3.3 COLOR CODING

- A. Color-code 208/120 volt, 3 phase, four wire, "wye" connected secondary electrical systems service entrance, feeder and branch circuit conductors throughout the secondary electrical system as follows:

Phase A - Black, Phase B - Red, Phase C - Blue
 Three-way & four-way travelers - Pink
 Neutral - White, Equipment Ground - Green

3.4 TESTING

- A. Conductor insulation test shall be performed on all electrical service entrance conductors, switchboard/panelboard and transformer feeder conductors and branch circuit conductors #2 AWG and larger. An insulation test shall be performed on any feeder or branch circuit as requested by the Professional for trouble shooting purposes. The "600V Conductor Insulation Test Report" found at the end of this section shall be completed with test results and shall be submitted to the Professional prior to substantial completion of the project.
- B. 600 volt conductor insulation tests shall be performed using a 500 volt megger. Each conductor shall be tested with all splices made but no equipment or devices connected. Feeder/branch circuits with paralleled conductors shall have conductors tested separately prior to paralleling. The ohmic value measured shall be recorded and the results shall meet the minimum requirements as follows. Conductors not meeting these minimum requirements shall be replaced or repaired as directed by the Professional.

<u>Conductor Size</u>	<u>Kilohms (min.)</u>
#12 AWG	1000
#10 AWG thru #8 AWG	250
#6 AWG thru #3 AWG	100
#2 AWG thru #3/0 AWG	50
#4/0 AWG thru 500 MCM	25
750 MCM	12

END OF SECTION 26 01 30

600V CONDUCTOR INSULATION TEST REPORT

I. Testing Organization

Company Name: _____ Test Date: _____

Representative: _____ Telephone
No.: _____

II. Project Information

Project Name: _____ W/O Job No.: _____

Project Address: _____

III. Test Results

Circuit Information		Conductor Information		Test Results (Kilohms)	
Source Load	Number/Size	PH. A	PH. B	PH. C Neut.	
=====	=====	=====	=====	=====	
_____	_____	_____	_____	_____	
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(make copies of page as required)

SECTION 26 02 50 GROUNDING & BONDING SYSTEM

PART 1 - GENERAL

1.1 GENERAL

- A. Bonding and grounding of all electrical equipment, enclosures, raceways, etc. as shown on the drawings and in strict accordance with Article 250 of the NEC.

PART 2 – PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 WIRING DEVICES

- A. Equipment grounding terminal (green) of all grounding type receptacles/devices shall be bonded to the equipment grounding conductor and to the device's enclosure with a properly sized bonding conductor (green) unless the receptacle/device is approved and listed for self-bonding.

3.2 RACEWAYS, BOXES & ENCLOSURES

- A. Pull into all power branch circuit and feeder raceways one green equipment grounding conductor of the same size as the branch circuit conductors or size as noted on the drawings and bond this conductor to the box ground terminal, receptacle/device ground terminal (green), equipment grounding bus of panelboard, cabinet and/or enclosures.
- B. Where conduits in excess of 1-1/4" trade size and all feeder conduits enter an enclosure, box, etc. provide grounding bushing or bronze ground clamps with bonding conductors sized per the NEC (#10 AWG minimum) connected to all ground bushings/clamps and thence to equipment enclosure and/or equipment grounding bus.
- C. Couple conduits together and connect to boxes, fittings and enclosures so as to provide effective electrical continuity. Assure ground continuity on GRS feeder and branch circuits by two locknuts, one inside and one outside of all boxes, cabinets and gutters. Do not use couplings dependent on screws bearing on conduit.

END OF SECTION 26 02 50

SECTION 26 03 10 PANELBOARDS

PART 1 - GENERAL

1.1 BRANCH CIRCUIT PANELBOARDS

A. GENERAL

1. Commercial grade branch circuit panelboards complete with feeders, circuit breakers and branch circuits as scheduled and/or shown on the drawings. Where shown on the drawings to be service entrance equipment, panelboards shall be specifically approved for that purpose and shall have all required accessories.
2. Branch circuit homerun conductors shall be connected to circuit breakers served from separate phase busses of the panelboards. Loads shall be properly balanced on each phase. Only one conductor shall be connected to a lug and/or terminal.
3. Panelboards and components shall be manufactured in accordance with applicable NEMA standards and the NEC and shall be UL listed. Installation and connection of all panelboards shall comply with the NEC and their UL listing.
4. Bonding and grounding in accordance with Section 260250 "GROUNDING & BONDING SYSTEMS" of this specification.

PART 2 - PRODUCTS

2.1 CIRCUIT BREAKERS

- A. Circuit breakers shall be molded case, thermal magnetic type with bolted connections and characteristics as shown on the drawings including ampere and voltage ratings, minimum interrupt rating (KAIC) and accessories as shown on the drawings or herein specified. Circuit breaker fault current interrupt capacities shall be fully rated. Series ratings are not acceptable.
- B. All single pole 15 and 20 ampere circuit breakers shall be UL listed SWD for switching duty. All circuit breakers serving HVAC equipment shall be UL rated HACR. All 15 and 20 amp circuit breakers serving high magnetic (HM) or high intensity discharge (HID) loads shall be HM or HID rated, respectively.

2.2 MANUFACTURERS

- A. Panelboard(s) with characteristics as shown on the drawings, herein specified, and as manufactured by the existing equipment manufacturer.

PART 3 – EXECUTION

3.1 BRANCH CIRCUIT BREAKERS

- A. Panelboards served from the secondary side of a dry-type transformer constituting a separately derived system shall be provided with a main circuit breaker sized as shown on the drawings or per the NEC if size not indicated.

- B. Branch circuit breakers serving receptacles or equipment located under a kitchen range/exhaust hood equipped with a fire suppression system shall be the shunt-trip type controlled by the fire suppression system control panel. All circuitry (conduit and wiring) required for the interface of these systems shall be provided.
- C. Branch circuit breakers serving elevator motors shall be the shunt-trip type controlled by the building Fire Detection and Alarm System or the Fire Protection System as shown or noted on the drawings. All circuitry (conduit and wiring) required for the interface of these systems shall be provided.

3.2. IDENTIFICATION / LABELING

- A. Provide complete typewritten directory with transparent plastic cover inside of panelboard door. Panelboard designation as indicated on the drawings shall be identified by 3/4" bakelite label, white with minimum 1/2" high, black engraved letters on front face if the panelboard is surface mounted or inside of door if panelboard is flush mounted. Typed copy of each panelboard circuit directory shall be submitted with shop drawing submittal for approval.
- B. Branch circuit panelboard circuits shall be numbered in sequence vertically down the left side then vertically down the right side and all circuits shall be provided in the panelboard exactly as they are shown on the drawings. Numbering to be consecutive for double or triple section panelboards. Neutral connections shall be identified by adhesive number tags to identify with their associated branch circuit phase conductors.

END OF SECTION 26 03 10

SECTION 26 04 10

WIRING DEVICES

PART 1 – GENERAL

1.1 SUMMARY

- A. Wiring devices shall be furnished and installed as shown on the drawings and as specified herein

PART 2 – PRODUCT

2.1 WALL SWITCHES

- A. Wall switches shall be the following heavy-duty specification grade as manufactured by Hubbell or approved equal in Pass and Seymour (P&S), Leviton or Arrow Hart. Contractor shall verify device color with Professional prior to ordering devices.

Single pole, 20A, 120/277V: Hubbell Cat. No. HBL1221, P&S Cat. No. PS20AC1, Leviton Cat. No. 1221-2.

Three-way, 20A, 120/277V: Hubbell Cat. No. HBL1223, P&S Cat. No. PS20AC3, Leviton Cat. No. 1223-2.

Four-way, 20A, 120/277V: Hubbell Cat. No. HBL1224, P&S Cat. No. PS20AC4, Leviton Cat. No. 1224-2.

2.2 OCCUPANCY SENSORS

- A. Occupancy sensors shall be the following as manufactured by Leviton or approved equal in WattStopper or Unenco. Contractor shall verify device color with Professional prior to ordering devices.

Wall-box occupancy sensor, passive infrared, 180 degree X 2100 s.f., with manual on/off override switch: Leviton Cat. No. ODS15-ID, Unenco Cat. No. WSR-1200.

Occupancy Sensor, ceiling mount, multi-technology type (infrared/ultrasonic), 360 degree X 2000 s.f., with power pack: Leviton Cat. No. ODC20-M0W-ODP, WattStopper Cat. No. CI-205, Unenco Cat. No. CUI-500-2000.

Occupancy Sensor, ceiling mount, multi-technology type (infrared/ultrasonic), 180 degree X 500 s.f., with power pack: Leviton Cat. No. ODC10-M0W-ODP, WattStopper Cat. No. CI-205, Unenco Cat. No. CUI-800-1500.

Occupancy Sensor, ceiling mount, ultrasonic type, 360 degree X 2000 s.f., with power pack: Leviton Cat. No. ODC20-U0W-ODP, WattStopper Cat. No. W2000H, Unenco Cat. No. C500-2000.

Occupancy Sensor, ceiling mount, ultrasonic type, 180 degree X 1000 s.f., with power pack: Leviton Cat. No. ODC10-U0W-ODP, WattStopper Cat. No. W1000H, Unenco Cat. No. C500-1000.

Occupancy Sensor, ceiling mount, passive infrared, 360 degree, 360 degree X 450 s.f., with power pack: Leviton Cat. No. OdC04-I0W-ODP, WattStopper Cat. No. CI-200-1, Unenco Cat. No. PIR-6.

2.3 RECETACLES

- A. Convenience outlets and receptacles as manufactured by Hubbell, as stated or equal in Pass and Seymour (P&S), Leviton or Arrow Hart. Contractor shall verify device color with Professional prior to ordering devices.
- B. Duplex grounding receptacle (HD specification grade), 20A, 125V: Hubbell Cat. No. HBL5352, P&S Cat. No. 5362, Leviton Cat. No. 5362-S.
- C. Duplex grounding receptacle, ground fault interrupter type (HD specification grade), 20A, 125V: Hubbell Cat. No. GF5352, P&S Cat. No. 2091, Leviton Cat. No. 8899.
- D. Duplex grounding receptacle, weatherproof, ground fault interrupter type (HD specification grade), 20A, 125V: Hubbell Cat. No. GF5352, P&S Cat. No. 2091, Arrow Hart Cat. No. GF5342, Leviton Cat. No. 6899. Plates shall be equal to Hubbell Cat. No. 5206WO or Cat. No. WP8MHP for permanent or "in-use" outdoor cord and plug connections.
- E. Clock outlet with surface clock: Outlet - Simplex Plug Cat. No. 2310-1013 and Receptacle Assembly Cat. No. 2310-9011, Clock - Simplex Cat. No. 2310 or approved equal with 15" round dial with red sweep second hand.

2.4 SAFETY SWITCHES

- A. Safety switches shall be the following as manufactured by the Square D Company or equal in General Electric, Siemens, Cutler Hammer or Allen Bradley.

Safety switch, heavy-duty, with ground lug	H200-H300 Series
Manual motor switch, single pole	Class 2510, Type FO-1

PART 3 – EXECUTION

3.1 WALL SWITCHES (Line Voltage)

- A. Wall switches shall be flush A.C. tumbler-type, back and side wired, and shall be installed to cut ungrounded conductors. Conductors shall be connected using side wired screw terminals.
- B. Shall be ganged together under one non-sectionalized plate in gangable boxes where two or more switches occur at one point. Provide metal barrier within box between all adjacent switches served by circuit conductors of different phases or conductors of a different system.
- C. Shall be mounted 48" above finished floor to center of operating handle or as noted on the drawings. Mounting heights may be adjusted slightly to permit cutting of masonry block to the top or bottom of the block course nearest the specified height. All mounting heights shall be consistently cut above or below block coursing such that switches will be the same height above the finished floor.
- D. Wall switches shown at door ways shall be mounted adjacent to door ways on opposite side of door from hinges unless prohibited by wall space. Where switches must be mounted on same side of door as hinges, mount switches so as not to be located behind the opened door. First switch of single or ganged switch bank shall be mounted within 12" of door frame and/or edge of door.

- E. Occupancy sensors shall be rated for the load connected (incandescent, fluorescent, etc.) and shall be wall-box or ceiling mounted device(s) as shown or noted on the drawings.
- F. Supplied device manufacturer shall provide a layout plan for each space shown to have the lighting controlled by an occupancy sensor. Device layout shall provide maximum coverage of the installed space. The layout plan shall dictate the type of device, the mounting height and location and the aiming parameters. Each device shall be located and aimed per the manufacturer's recommendations. Division 26 Contractor is responsible for all adjustments and final settings of devices for proper operation.
- G. Wall-box sensors shall be mounted 48" above finished floor to center of the device, as noted on the drawings or at same height as wall switches. Mounting heights may be adjusted slightly to permit cutting of masonry block to the top or bottom of the block course nearest the specified height. All mounting heights shall be consistently cut above or below block coursing such that switches will be the same height above the finished floor.
- H. Wall-box sensors shown at doorways shall be mounted adjacent to doorways on opposite side of door from hinges unless prohibited by wall space. Where devices must be mounted on same side of door as hinges, mount so as not to be located behind the opened door. Device shall be mounted within 12" of door frame and/or edge of door.
- I. Ceiling mounted units shall receive control power from a separately mounted auxiliary power and control unit (power pack). The occupancy sensor shall control the operation of the power switching contacts in the power pack.
- J. Shall turn lighting luminaires "on" when room/space is occupied and "off" when unoccupied unless otherwise indicated on the drawings. Sensor location, aiming and adjustment shall insure that lighting turns "on" immediately as occupants enter room/space from all entrances. Shall have field adjustable "off" delay of 1 to 15 minutes minimum.

3.2 POWER RECEPTACLES

- A. All convenience receptacles shall be specification or industrial grade as listed, straight blade type, 2 pole 3 wire grounding, back and side wired with nylon face. Conductors shall be connected using side wired screw terminals.
- B. Convenience outlets and receptacles shall be mounted center line up 16" above finished floor unless shown or noted on the drawings otherwise. Convenience outlets and receptacles located at counters shall be mounted center line up 4" above counter top or backsplash unless shown or noted on the drawings otherwise. Mounting heights may be adjusted slightly to permit cutting of masonry block to the top or bottom of the block course maintaining the minimum specified height. All mounting heights shall be consistently cut above or below block coursing such that receptacles/outlets will be mounted the same height above the finished floor. Adjacent devices to be mounted at same height unless otherwise directed.
- C. Carefully review Architectural, Furniture and Interior Design drawings for furniture, casework or millwork. Do not rough-in receptacles behind equipment, millwork, etc. except where specifically noted. Where receptacle is shown behind equipment, verify proper mounting height with the Professional prior to rough-in.

- D. Where receptacles serve equipment (i.e. refrigerators, ranges, dishwashers, ice makers, etc.) intended to be installed flush with the adjacent millwork, walls, etc., receptacle locations and mounting heights shall be fully coordinated with the supplied equipment shop drawings so that neither the receptacle nor the associated cord and plug connection interferes with the correct placement of the equipment.
- E. Special purpose receptacles shall have voltage, phase and ampere ratings as indicated on the drawings and of proper NEMA configuration. Each receptacle shall be HD specification grade. Special receptacles for power connection of equipment shall have proper NEMA configuration for equipment served and equipped with proper plug completely installed.

3.3 SAFETY SWITCHES

- A. Safety switches shall be heavy-duty type as defined by NEMA, fusible or non-fusible as indicated on the drawings and shall be rated for the voltage of the circuit in which installed. Switches shall have the proper number of poles as indicated on the drawings or as required for the phase characteristics of the circuit in which installed. A ground lug shall be provided in all safety switches.
- B. Safety switches shall have proper NEMA rated enclosure for the environment and conditions in which installed per the NEC and per the following:
 - 1. Indoor dry locations - NEMA 1
 - 2. Indoor wet locations - NEMA 3R
 - 3. Kitchen areas - NEMA 4X
 - 4. Outdoor locations - NEMA 3R
 - 5. Corrosive indoor/outdoor locations - NEMA 4X
- C. Where safety switches are indicated to be fusible, they shall have dual element, time delay fuses installed as manufactured by Bussman Fusetron Series or approved equal with proper voltage rating for the associated circuit and current size as indicated or as required for the connected equipment.
- D. Where installed indoors, surface mount safety switches 54" to center of operating handle above the finished floor. Where installed out-of-doors on exterior walls, surface mount safety switches 36" to center of operating handle above the finished grade. Where installed out-of-doors and behind equipment screen walls, surface mount safety switches with top of switch enclosure 6" below top of screen wall and bottom of enclosure a minimum of 18" above the finished grade or slab.
- E. Where power connections are made out-of-doors through safety switches and where there is no wall or proper equipment frames to which the switches may be mounted, Contractor shall furnish and install a galvanized angle iron frame independent of the equipment for the support of the switch(es). Frames shall consist of the steel frame sufficient to support all of the switches and a concrete footing not less than 12 inches deep and of sufficient width to assure that 4 inches of concrete surround all of the framing members.
- F. Safety switches shall be installed such that they are readily accessible as defined by the NEC with a clear and unobstructed path thereto. Fully coordinate safety switch mounting locations prior to rough-in with other trades to insure accessibility.

- G. Each safety switch shall be label on the face of the enclosure door as to the load connected. The label nomenclature shall read the same as the connected equipment label provided. The exterior label shall be suitable for the environment in which installed and shall be self-adhesive, 1/2" bakelite label, white with minimum 1/4" high, black engraved letters. On the interior side of the safety switch enclosure door, permanently label using a self-adhesive printed label the connected load designation, the serving panelboard designation and the serving branch circuit number designation.

END OF SECTION

SECTION 26 04 20

LIGHTING LUMINAIRES

PART 1 - GENERAL

1.1. LIGHTING LUMINAIRES

- A. Provide and connect all luminaires as shown on the drawings by symbols and as defined in the luminaire schedule(s). Luminaires shall be provided with all necessary mounting accessories. The installation of all luminaires shall be complete, safe and in full accordance with manufacturer's recommendations and these specifications. This contractor shall provide additional 1-1/2" x 1-1/2" x 12 ga. channel bridging where necessary to mount luminaires governed by the conditions encountered.
- B. Substituted luminaires shall meet the performance and functional characteristics and the general appearance and dimensions (+/-10%) of the specified luminaires. Approval of submitted substitute luminaire(s) shall not eliminate the Contractor's responsibility to provide luminaires similar in characteristics to the specified luminaire(s).
- C. The catalog numbers of recessed luminaires, where applicable, are for use in an exposed grid suspension type ceiling system. The Contractor is responsible for providing luminaires with the proper hardware and/or accessories for installation in the ceiling type encountered.
- D. The lighting luminaire locations shown on the Electrical drawings are approximate and representative. Contractor shall refer to and coordinate with the Architectural reflected ceiling plans and elevation drawings for exact lighting luminaire mounting heights and locations.
- E. See Section 260100 "Basic Electrical Materials & Methods" for additional requirements for hazardous locations and seismic areas.

PART 2 - PRODUCTS

2.1 INDOOR LUMINAIRES

- A. Procure luminaires completely factory wired for proper operation in the application shown on the drawings. All luminaires shall be furnished with proper fittings and accessories for installation in the area encountered. This Contractor shall review the Architectural plans and specifications and provide luminaires compatible with the ceiling specified in each area.
- B. Lighting luminaire lenses specified by catalog number and/or by descriptive reference shall be virgin acrylic plastic and shall equal or exceed IES-SPI-NEMA test for yellowing factor of not to exceed three (3) after 2000 hours exposure in a Fade-o-meter for the standard test conditions. The flat portions of all lenses shall be not less than .125 inches thick and shall weigh not less than eight (8) ounces per square foot.
- C. Doors and other access means shall be smooth operating, free from light leakage under operating conditions and arranged to permit relamping without the use of tools. Arrange doors, frames, lenses, diffusers and other pieces to prevent accidental falling during relamping and when secured in operating position.

- D. All LED luminaires and/or components shall be tested in accordance with IESNA- LM-79. Provide LM-79 test results for the total luminaires flux, electrical power, efficacy and chromaticity on luminaire cut sheets. All LED light sources/ lumen maintenance shall be tested in accordance with IESNA-LM-80. Provide LM-80 test results on luminaire cut sheets. All luminaires shall carry a minimum of 5 years warranty.

2.2 OUTDOOR LUMINAIRES

- A. Metal parts shall be free from burrs, sharp corners and edges and shall be manufactured of corrosion-resistant aluminum, die-cast aluminum, steel or other material as shown on the drawings or specified herein. Steel or other materials subject to corrosion or rust shall have proper corrosion-resistant and weather proof finish applied after fabrication. Plastic and other non-metallic parts shall have a high resistance to yellowing and other changes due to aging, exposure to heat and ultraviolet radiation.
- B. Housings shall be rigidly formed, weather- and light-tight enclosures. Doors and other access means shall be smooth operating, free from light leakage under operating conditions and arranged to permit relamping without the use of tools. Arrange doors, frames, lenses, diffusers and other pieces to prevent accidental falling during relamping and when secured in operating position.
- C. All exposed hardware, screws and other fasteners shall be manufactured of stainless steel.

PART 3 - EXECUTION

3.1 INDOOR INSTALLATION/MOUNTING

- A. Luminaires mounted level, plumb and square with ceiling and walls with bottom edge above finished floor as indicated on the drawings unless specifically noted otherwise. Luminaires shall be properly secured according to manufacturer's recommendations.
- B. Luminaire mounting shall be rigid and independent of the ceiling tile(s) and shall be supported from the major structural elements of the ceiling system. Luminaires mounted to concrete shall be anchored with concrete inserts or other means of similar strength as approved by the Professional.
- C. Mounting of recessed luminaires shall be in accordance with Article 410 of the NEC. Luminaires installed in suspended ceiling systems shall be securely fastened to the ceiling framing members by mechanical means. Recessed fluorescent luminaires requiring a ceiling opening in excess of nine (9) square feet shall be supported independent of the ceiling system.
- D. All recessed luminaires in accessible ceilings shall be connected with 1/2" flexible conduit from accessible junction box with sufficient length to allow luminaire to be relocated to any adjacent ceiling panel without disconnecting. 3/8" flexible conduit may be used if furnished with the luminaire by the manufacturer. All recessed luminaires in non-accessible ceilings, unless otherwise indicated, shall be pre-wired from the factory with junction box for terminating branch circuit conduit.
- E. Recessed luminaires shall be installed to properly coordinate with and maintain the fire rating of the ceiling in which installed. Where fire rating installation requires covering over luminaire housing, ballast(s) of proper temperature rating as recommended by the manufacturer shall be furnished.

- F. Surface luminaires mounted on combustible ceilings or low density acoustical tile ceilings shall be UL approved for such mounting. Surface luminaires mounted on LAT ceilings shall be supported from and properly secured to the ceiling framing members and connected via flexible conduit similar to recessed luminaires. Where surface luminaires are served by exposed raceway, luminaires shall have surface conduit collar furnished by the luminaire manufacturer.
- G. The lighting luminaire locations shown on the Electrical drawings are approximate and representative. The Contractor shall review the Architectural reflected ceiling plans, elevation drawings, etc. for exact locations and mounting heights of lighting luminaires and for other elements which may effect luminaire mounting and/or operation. Mounting heights of all wall mounted luminaires shall be fully coordinated with the Professional prior to rough-in.

3.2 EXTERIOR INSTALLATION/MOUNTING

- A. Procure luminaires completely factory wired for proper operation in the application shown on the drawings. All luminaires shall be furnished with proper fittings and accessories for installation in the area encountered. This Contractor shall review the Architectural plans, elevations and specifications and provide luminaires compatible with the wall structure and finishes specified in each area.
- B. Luminaires shall be mounted level, plumb and square with exterior elements of the building. Mounting heights indicated on the drawings are to bottom of luminaire above the finished floor unless specifically noted otherwise. Luminaires shall be secured according to the manufacturer's recommendations.
- C. The lighting luminaire locations shown on the Electrical drawings is approximate and representative. The Contractor shall review the Architectural reflected ceiling plans, elevation drawings, etc. for exact locations and mounting heights of lighting luminaires and for other elements which may effect luminaire mounting and/or operation. Mounting heights of all wall mounted luminaires shall be fully coordinated with the Professional prior to rough-in.
- D. Luminaire installation shall not allow water to penetrate luminaire housing or electrical outlet box. Gaskets and other weather proofing shall be provided and installed as required.
- E. Enclosed exterior mounted luminaires shall be properly sealed to prevent insects from entering the luminaire housing.
- F. Luminaires with adjustable mounting brackets shall be properly adjusted per the Professional's direction. Once the luminaire adjustments have been approved by the Professional, properly tighten and secure adjustments to prevent movement. Adjustment of luminaires may require after hours labor.
- G. Mounting of ground mounted luminaires shall include concrete bases as detailed on the drawings or if detail not shown as specified herein. Bases shall be of minimum 3000 p.s.i. concrete and provide a minimum of 3" of concrete coverage on all sides of luminaire stanchion or other support(s) as specified. A concrete pad on finished grade 4" thick shall be provided at each luminaire with a minimum dimension of 18" square with luminaire centered or as required to maintain a minimum 12" clear from edge of pad to luminaire.

END OF SECTION

SECTION 26 04 50

EQUIPMENT ELECTRICAL SERVICES

PART 1 - GENERAL

1.1 GENERAL

- A. Provide and connect proper branch circuit(s) and final connection(s) to all equipment requiring electrical service(s). Equipment electrical service connections shall be as indicated on the drawings and/or as recommended by the equipment manufacturer. Branch circuit and final connection conduits shall be in accordance with SECTION 26 01 10 "RACEWAYS & FITTINGS".
- B. Review architectural drawings and specifications and provide adequate electrical services for and make proper connections to all equipment furnished by the General Contractor requiring electrical service.
- C. Carefully review plumbing and HVAC drawings and Division 22 of the specifications for mechanical equipment requiring electrical services. Provide adequate electrical services for and make proper connections to all such mechanical equipment requiring electrical service.
- D. Electrical services and connections to equipment shall follow the equipment manufacturer's recommended method. Where the equipment furnished exceeds the circuit capacity or requires different characteristics than that shown on the drawings, this information shall be brought to the attention of the Professional prior to the branch circuit or connection rough-in.
- E. The Division 26 Contractor shall immediately upon notice to proceed and after verification of service with the serving Utility Company notify in writing the General Contractor, the Division 22 Contractor(s) and all other affected Contractors the characteristics of the electrical service(s) of the facility(ies) including voltage and phase. A copy of this notification shall be submitted to the Professional with the project electrical shop drawings.
- F. The equipment electrical service connection locations shown on the drawings are approximate and representative. Verify and coordinate actual electrical service rough-in locations, requirements, etc. with the Contractor providing the equipment and the associated manufacturer's shop drawings.

PART 2 - PRODUCTS

2.1 MAINTENANCE DISCONNECTS

- A. All power connections to equipment shall include a maintenance disconnect of the type indicated or if not specifically indicated as recommended by the equipment manufacturer in compliance with the NEC.

PART 3 – EXECUTION

3.1 MAINTENANCE DISCONNECTS

- A. Maintenance disconnect switches for equipment shall be located adjacent to the associated equipment and readily accessible as defined by the NEC. Location of disconnect switches shall be fully coordinated with the equipment provider, the supplied equipment shop drawings and the adjacent building elements so as not to interfere with the correct placement and operation of the equipment. Maintenance disconnect switches shall be provided with lock-out provisions.
- B. On multi-motor equipment connections (i.e. condensing units, roof-top HVAC units, etc.), the Division 26 Contractor shall verify with the Division 22 Contractor and obtain in writing the manufacturer's requirements for the equipment overcurrent devices. Provide HACR rated branch circuit breaker for each load in the serving panelboard of size as required by the manufacturer of the connected equipment. Where fuses or HACR breakers are permitted for overcurrent protection, utilize the serving HACR breaker for overcurrent protection and provide non-fused maintenance disconnect switch. Where fuses are required by the equipment manufacturer for overcurrent protection, provide fusible disconnect switch with fuse sizes as recommended by the manufacturer of the connected equipment. Obtain written approval from Division 22 Contractor of overcurrent device size and method before energizing equipment.
- C. See Section 260410 "Wiring Devices" for additional requirements for Safety Switches.

3.2 HVAC EQUIPMENT ELECTRICAL SERVICES

- A. Electrical service connections to ventilating fans shall include manual motor switch installed and connected where directed. Where fans are furnished with speed control devices, the Division 26 Contractor shall install the control device where directed and connect through it in addition to the manual motor switch. Where fans control or are controlled by other equipment such as timers, motorized louvers, firestats, EMCS control panels, etc., the Division 26 Contractor shall coordinate with the supplying Contractor and make connection to the fan through or with this device as required for proper operation.
- B. Electrical service connections to HVAC equipment to include branch circuit wiring to the line side of line voltage control device such as magnetic starter, contactor, VFD, etc. and from load side of control device through motor terminals or equipment connection lugs. The control devices shall be furnished by the Division 22 Contractor and installed where directed by the Division 26 Contractor. Control devices which are integral pre-wired parts of equipment require connection to the line side of the control device only by the Division 26 Contractor unless otherwise indicated. All additional wiring including control wiring shall be furnished and installed by the Division 22 Contractor. Line voltage thermostats and other temperature control devices regardless of voltage shall be furnished, installed, wired and connected by the Division 22 Contractor.

3.3 OTHER EQUIPMENT ELECTRICAL SERVICES

- A. The Division 26 Contractor shall provide proper branch circuit, disconnect device and final connection to all equipment requiring electrical service furnished under other Divisions of the specifications.
- B. Set disconnect switch or other approved device if disconnect switch not shown adjacent to equipment and make final connection to the equipment as required in accordance with SECTION 26 01 10 "RACEWAYS AND FITTINGS". Connection to include power wiring to the line side of the equipment controller or to the power connection location as applicable.

- C. Division 26 Contractor shall obtain approved rough-in drawings for each item of equipment requiring connection and follow the manufacturer's recommendation as to the location and the method of connections.
1. System/Pre-Wired Furniture. Rough-in locations shown on the drawings are approximate and representative. Actual rough-in locations, mounting heights, etc. shall be fully coordinated with the Professional and the furniture supplier. Rough-in shall consist of three (3) gang partitioned box with three (3) gang raised cover mounted flush in wall or three (3) gang floor box with proper cover plate for furniture connection. Two compartments of the rough-in boxes shall be for telecommunications cabling connection provisions. See Section 260510 "Telecommunication Raceway System" for additional requirements. All power branch circuit connections to the furniture connection whips furnished with the furniture shall be by the Division 26 Contractor. Proper branch circuitry including proper number of phase, neutral and grounding conductors shall be provided as required by the supplied furniture. Branch circuit requirements shall be fully coordinated with the furniture supplier prior to any rough-in.

END OF SECTION

SECTION 26 05 10

TELECOMMUNICATION RACEWAY SYSTEM

PART 1 - GENERAL

1.1. GENERAL

- A. Applicable requirements listed in Sections 260110 "Raceways and Fittings" and 260120 "Boxes and Enclosures" shall apply. All telecommunication raceway installations shall comply with the applicable requirements of the ANSI/EIA/TIA standards.
- B. Raceway system including conduits, boxes, plates and backboards as shown on the drawings by symbols and as specified herein.
- C. Provide bushing on all conduits.
- D. All contractors performing installation of communications infrastructure shall have a BICSI Registered Communication Distribution Designer (RCDD) on staff.
- E. All contractors performing installation of communications infrastructure shall have a BICSI Information Transport Systems Installer 2 (ITS-Installer 2) on site.

PART 2 – PRODUCTS

2.1 TELECOMMUNICATION ROOMS

- A. Telecommunication backboards shall be 3/4" plywood minimum AC grade sized as shown on the drawings or 8' X 4' if size not indicated mounted with the long dimension vertical. Plywood backboards shall be void free and fire-rated. Install the A grade side of plywood facing into the room. UL stamp shall be clearly visible on each sheet of plywood Where required by local codes, cover plywood backboard w/sheet rock.
- B. A grounding bus bar meeting the requirements of EIA/TIA 607 shall be provided in each telecommunication room or backboard location. The grounding bus bar shall be copper of minimum dimensions 20"X4"X1/4" with wall mounting bracket with insulators to isolate the ground bar. The ground bar shall have pre-drilled termination holes of proper size to terminate #12 through #4 AWG copper wire properly spaced over the entire length and width of the bar.

PART 3 - EXECUTION

3.1. HORIZONTAL RACEWAY SYSTEM

- A. Telecommunication system conduits and rough-in provisions shall not be less than six (6) inches from any source of alternating current unless separated by a grounded metallic partition.
- B. Conduit routing shall follow most direct route possible to the designated termination point(s) within constraints of Section 260110 with no more than two (2) 90 degree bends between pull points and/or junction boxes. For conduit runs greater than 100 feet, provide junction box(es) sized per NEC such that no conduit segment exceeds 100 feet.
- C. Conduit bend radius shall be minimum 6 times the internal diameter for conduits with internal diameters 2" or less and 10 times the internal diameter for conduits with internal diameters greater than 2".
- D. Provide a nylon pull string with a minimum test rating of 200 lbs. in all empty conduits.

- E. Work Area Outlets. Outlet boxes shall be 4" square X 2.5" deep with appropriate depth single gang raised cover unless noted otherwise on the drawings or required for the number of receptacles installed. Mount outlet boxes with center at same height as adjacent receptacles, as noted on the drawings or at sixteen (16) inches to centerline above the finished floor. Telecommunication outlets shall be mounted within 12" of adjacent power receptacle where shown on the drawings. Do not mount outlet boxes back-to-back.
- F. Conduits serving work area outlets shall be 3/4" unless noted otherwise on the drawings and shall be routed to termination points as dictated by the drawing symbol(s) or notes. Conduit homeruns serving outlet boxes in rooms/spaces with accessible ceilings shall have in-line junction box mounted above the accessible ceiling to allow access to raceway for systems terminating within the space.
- G. System/Pre-Wired Furniture rough-in provisions and connections shall include two 1 inch conduits for telecommunication cabling for each connection. Conduits shall be routed from proper compartments in furniture connection box (wall or floor) to telecommunication room, to above the accessible ceiling, to the J-hook system or to the cable tray system as shown or noted on the drawings or specified herein.
- H. J-Hook System. A J-hook system shall be provided in all corridors, large open office areas or as shown or noted on the drawings for the routing and support of telecommunication cabling. The number of j-hooks provided for each system shall be as required for the number of cables installed plus 25% spare or as shown or noted on the drawings. No more than 50 cables shall be installed in a 2" diameter j-hook. See Section 260110 "Raceways and Fittings" for additional j-hook assembly requirements.

3.2 TELECOMMUNICATION ROOMS.

- A. Provide telecommunication backboards as shown on the drawings or as a minimum one per telecommunication room
- B. The grounding bus bar shall be properly bonded to its associated grounding conductor using a properly sized mechanical lug. Mount bus bar at 6'-6" AFF.
- C. A #3/0 grounding conductor in 1 inch conduit or size as shown on the drawings shall be provided from the electrical service entrance equipment ground bus to each telecommunication room ground bus bar. The grounding conductor may be installed "daisy-chained" from backboard to backboard or radially from service entrance equipment. A grounding type bushing shall be used at each end of the conduit and shall be properly bonded to the ground conductor at all wire exit points. Grounding conductor splices, if required, shall be made with irreversible compression type splices.
- D. Provide a minimum of two double duplex grounding receptacles or number as shown on the drawings on dedicated branch circuit(s) at each telecommunication system backboard. The telecommunication room receptacle branch circuits shall be routed through a branch circuit junction box mounted at the overhead structure or above the accessible ceiling where present within the telecommunication room to allow for future receptacle additions. Receptacle(s) shall be mounted at the specified height or as directed by the Professional or Owner and arranged so as not to be mounted behind conduits or cabling.
- E. Service entrance, backbone and work area outlet conduits shall be stubbed into the telecommunication room in an accessible location using the minimum number of bends and offsets possible. Conduits entering from the floor slab or overhead structure shall be stubbed into the space 4 inches above the slab or below the bottom of the overhead structure.

3.3 TELECOMMUNICATION SERVICE ENTRANCE.

- A. Verify the telecommunication service connection point and all requirements with the Owner prior to any rough-in.
- B. The existing telecommunication service entrance raceways is routed underground from the service connection point as shown or noted on the drawings and shall remain.

END OF SECTION

SECTION 27 06 00 SPECIAL SYSTEMS

PART 1 - GENERAL

1.1 GENERAL

- A. The Systems listed below and hereinafter specified require specialized skill and experience in their installation and shall comply with the requirements of this Section of the Specifications.

<u>Section Number</u>	<u>Section Title</u>
270620	Telecommunication Horizontal Cabling System

- B. Each System shall be installed and connected in strict compliance with applicable codes and standards including NFPA, IBC, SBC, NEC, UL and ANSI.
- C. System(s) components and device locations shown on the drawings are approximate and representative and for estimating purposes only. Actual locations shall be coordinated with the architectural finishes encountered, other equipment and building structural elements. Component and device locations shall be properly located to provide maximum System performance in the room/space shown. All required mounting hardware and accessories shall be provided as required by the area and finishes encountered.
- D. Prior to component and/or device rough-in, the Company supplying the System(s) shall review the System(s) component and device locations, layout, etc. and make recommendations and any revisions necessary to facilitate maximum System performance. Proposed changes shall be shown and indicated on the System(s) one-line diagram(s).

1.2 EQUIPMENT SUBMITTALS

- A. In addition to the requirements of Section 26 00 30 "Electrical Equipment/Material Submittals", the Special Systems submittals shall include a complete System one-line diagram prepared by the Company supplying the System components and devices.
- B. The one-line diagram shall show each component and device, all interconnecting wiring and conduit, terminal strips with numbering, pull and junction boxes, device zoning or device addresses where applicable and any other information which is deemed necessary by the Professional. The type, size and number of wires shall be shown for each interconnection circuit. The number and size of all conduits and boxes shall be identified on the drawing. The conduit routing and wiring shown on the one-line drawings shall accurately depict the actual installation of the System in the field.
- C. The one-line diagram drawings shall be produced using a commercially available CAD software program capable of producing electronic drawing files compatible with AutoCad software. Drawing symbols and lettering shall be neat and legible and printing line weights used shall clearly distinguish System components/devices from background floor or site plan elements. All lettering shall be upper case. When background drawing (floor plan, site plan, etc.) requires paper size to exceed 11"X17", the scale of the System one-line drawing shall be one-half the scale of the Contract Drawings and printed on the smallest adequate standard size paper.

- D. Three (3) copies of complete operational and maintenance manuals for each installed System shall be provided to the Professional with the Close-Out Documents. These manuals shall be post-bound and indexed and shall include catalog information, operating procedures in detail, wiring diagrams of all components, complete system one-line diagrams, and the address and phone number of the service department of the supplying Company.

PART 2 – PRODUCT

2.1 EQUIPMENT

- A. System components shall be purchased from and supplied by a factory authorized company who maintains a complete inventory of spare parts and who has an active and experienced service organization capable of providing repair service within 24 hours of notification.
- B. Each component/device of the System(s) shall be UL listed. The installation of each component/device shall comply with the UL listing, applicable codes and standards, the manufacturer's recommendations and this specification.
- C. Component and device storage on the site shall include special precautions against temperature and humidity variations which exceed the manufacturer's recommendations. Any component or device which has been damaged due to storage conditions shall be repaired or replaced as directed by the Professional at no additional cost to the Owner.

PART 3 – EXECUTION

3.1. INSTALLATION

- A. System installation shall be by factory-trained, well experienced technicians employed by the Company supplying the System components and devices. These technicians shall perform the following System installation procedures as a minimum:
 - 1. Perform all wiring connections at each component and device and all splices and/or terminations made at junction or pull boxes.
 - 2. Perform testing of all wiring after installation and prior to connection to components to verify System is free of grounded or open circuits.
 - 3. Perform complete System operational test. This test shall be completed prior to any third party testing required by this specification.
 - 4. Perform operation and maintenance training of installed System to Owner's personnel.
 - 5. Provide System certification letter to the Professional prior to Substantial Completion stating that the System has been installed and is operating in accordance with the applicable codes and standards, this specification and the manufacturer's recommendations.

- B. System wiring shall be installed in conduit unless otherwise shown or noted on the drawings or within this specification. Conduit and wiring though not shown on drawings shall be provided by the Contractor to accomplish the intent of the System as shown on the drawings by symbols and this specification.
- C. System design is intended to show types of devices, appliances, etc. and their associated functions and operations required for each space. Quantities, spacing and location of these devices, appliances, etc. to perform the intended function shall be the installing Contractor's responsibility and shall comply with applicable codes and standards and this specification.
- D. System wiring and equipment installation shall be in accordance with good engineering practices as established by the EIA/TIA and the NEC and with the manufacturer's recommendations. All wiring terminations and splices shall be made using proper compression type connectors or terminal strips. Wire nut type connectors of any kind shall not be used on System wiring.
- E. The Company supplying the System(s) shall submit to the Professional prior to Substantial Completion a letter on the Company letterhead for each System installed under the Special Systems provisions signed by their supervising technician(s) for this Project(s) stating that all component/device installations and all wiring connections, terminations and testing were performed by factory-trained technicians in the regular employment of the supplying Company.

3.2 TESTING AND DEMONSTRATION

- A. A representative of the Company supplying the System who is completely familiar with the operation, functions and maintenance of the installed System shall provide operation and maintenance training for the Owner on the System and the associated programming software. The representative shall inform the Owner of all the System's available operations and functions, and after consultation with the Owner, shall provide program adjustments to the System in order for it to perform per the Owner's request. Contractor shall allow one additional site visit during the one year warranty period for re-programming and/or re-configuring of the System(s) at the Owner's request at no additional cost to the Owner.
- B. This operation and maintenance training shall be fully coordinated and scheduled with the Owner and the Professional and shall be held at the convenience of the Owner. Contractor shall provide signed statement from the Owner's representative with Close-Out Documents on each System installed stating that the System was demonstrated to the Owner's satisfaction.
- C. The required operation and maintenance training session(s) on each System demonstrated shall be video taped by the Contractor and the tape submitted to the Professional with the Close Out Documents. The recording media shall be compatible for playback on a standard DVD format player. Any adapters or other interface devices required for playback shall be provided.
- D. Prior to the Project's Substantial Completion, the complete System(s) shall be tested and physically inspected by the installing technician(s) for proper operation and installation. Any deficiencies shall be corrected. This testing shall be performed prior to any third party testing required by other Sections of this Specification.

END OF SECTION

SECTION 27 06 20 TELECOMMUNICATION HORIZONTAL CABLING SYSTEM

PART 1 - GENERAL

1.1 CODES and STANDARDS

- A. Shall be installed in the telecommunication raceway system(s) as shown and/or noted on the drawings and herein specified. The cabling system though not shown on the drawings shall be furnished and installed by the contractor to accomplish the intent of the system as shown on the drawings by symbols and as herein specified.
- B. Applicable requirements listed in the following sections shall apply: Section 260110 "Raceways and Fittings", Section 260120 "Boxes and Fittings" and Section 260510 "Telecommunication Raceway Systems."
- C. All work shall comply with the applicable codes and standards as issued by NEC, ANSI/EIA/TIA, BICSI, IEEE, UL and NFPA.
- D. All contractors performing installation of communications infrastructure shall have a BICSI Registered Communication Distribution Designer (RCDD) on staff.
- E. All contractors performing installation of communications infrastructure shall have a BICSI Information Transport Systems Installer 2 (ITS-Installer 2) on site.

1.2 SCOPE OF WORK

- A. The Contractor shall furnish all equipment, material and labor required to provide and connect in accordance with this specification and applicable drawings a fully operational Structured Telecommunication Horizontal Cabling Distribution System, hereinafter referred to as the "System" in this section of the specifications, to the complete satisfaction of the Professional.
- B. It is the intent of the drawings and this specification to provide a complete and operational System ready for the Owner's use. All equipment, accessories and/or material necessary for the proper operation of the System as herein specified not specified or described herein but normally provided in similar systems shall be deemed part of the specifications and shall be provided by the Contractor.

1.3 CONTRACTOR QUALIFICATIONS

- A. The structured cabling system Contractor, hereinafter referred to as the "Contractor" in this section of the specifications, shall be an experienced firm regularly engaged in the design and installation of cabling systems of similar size and complexity as required for this project and have the following minimum qualifications:
 - 1. Personnel trained and certified in the design of the approved structured telecommunication cabling system to be provided.
 - 2. Personnel trained and certified to install and connect the approved structured telecommunication cabling system to be provided.
 - 3. Personnel knowledgeable in local, state, province and national codes and regulations.

4. Personnel trained and certified in fiber optic cabling splicing, termination and testing techniques. These personnel must also have experience using a light meter and OTDR.
 5. Personnel trained in the installation of pathways and supports for housing telecommunication horizontal and backbone cabling.
 6. A minimum of one Registered Communications Distribution Designer (RCDD) who is a permanent employee of the structured cabling system Contractor.
 7. Possess required licenses/permits to perform telecommunications installations in the jurisdiction in which the project is located.
- B. Provide with the System(s) shop drawings a copy of all certifications and registrations of the Contractor's personnel that will be involved with the design and/or installation of the System(s).
- C. The required RCDD shall be a responsible party in the Contractor's management and/or installation team for this project and shall be fully aware of the day-to-day operations of the project. The RCDD shall as a minimum make regular visits to the project site during the installation of the associated System raceways and cabling as required to insure proper installation of each per this specification and applicable codes and standards. The RCDD shall affix his stamp to the Contractor's shop drawings, as-built drawings, etc. to indicate that he has reviewed the item and that it is complete and accurate, complies with the project requirements, and/or is representative of the system as actually installed.
- D. At the request of the Professional, the System Contractor shall provide in writing references of a minimum of three successfully completed projects of similar size and complexity as this project which have been completed by this Contractor in the three year period preceding this project's bid date. References shall include project name, location, Owner's contact person and telephone number.

PART 2 - PRODUCT

2.1 SYSTEM MANUFACTURERS

- A. The horizontal cabling and connectivity hardware shall be fully compatible and recognized by the manufacturer's of each component as required to provide the specified performance and the System warranty herein specified. Each major component of the System (copper cabling, fiber optic cabling and connectivity hardware) shall be provided by a single approved manufacturer of that component.
- B. Approved Copper Cable Manufacturer
1. Commscope
 2. General Cable
- C. Approved Copper Connectivity Hardware Manufacturer
1. Systimax
- D. Approved Fiber Optic Cable Manufacturers
1. Mohawk
 2. Corning
 3. Belden

4. Ber-Tek
5. Avaya

E. Approved Fiber Optic Connectivity Hardware Manufacturers

1. Siemon
2. Amp
3. Ortronics
4. Corning

2.2 HORIZONTAL CABLING SYSTEM - COPPER

- A. Telecommunication cabling shall be as manufactured by an approved cable manufacture as listed herein, shall comply with the appropriate category performance specifications outlined in ANSI/TIA/EIA-568-B.1, -B.2 & -B.3 and with this specification.
- B. Telecommunication cabling shall be unshielded twisted pair (UTP), four (4) pair, 100 ohm, Category 6, 24 gauge, Commscope Cat. No. 5EP4P24-BL-P-CMS. Outer jacket shall be blue in color or color coding as directed by the Owner.
- C. All cables shall be plenum rated and meet all current NFPA Fire Code requirements..

2.3 WORK AREA OUTLETS

- A. Telecommunication work area outlet receptacles shall be as manufactured by an approved connectivity hardware manufacture as listed herein and shall comply with the appropriate category specifications outlined in ANSI/TIA/EIA-568-B.1, -B.2 & -B.3 for the for the cable category in which connected and with this specification.
- B. Provide and connect Commscope Systimax Cat. No. 108-232-778 RJ-45, Category 6 compliant receptacles at each data outlet as shown on the drawings by symbols or specified herein with Commscope Systimax faceplate. Receptacle shall be blue and quantity per the plans.
- C. Work area outlet receptacles shall have the following characteristic:
 1. 310 style insulation displacement connectors with quadrant pair isolation and a pyramid wire entry system.
 2. Backwards compatible to allow lower performing category cables or connecting hardware to be connected and perform at their full capacity.
 3. Rear protective strain relief caps with side or rear entry.
 4. Allow for a minimum of 200 terminations without signal degradation below standards compliance limits.
 5. Support industry standards T568A and T568B wiring configurations.
 6. Color coded snap-in icons for circuit identification.
 7. UL listed and constructed of high-impact, flame retardant thermoplastic.
 8. Angled gravity-feed (45 degree angle) design.

- D. Telecommunication outlet plates shall be Commscope Systimax. Work area outlet plates shall have the proper number of knockouts as required for the receptacles to be installed and/or two receptacle knockouts minimum. Provide blank cover on unused plate knockouts.

2.4 CONNECTION BLOCKS

- A. Connection blocks shall be as manufactured by an approved connectivity hardware manufacture as listed herein and shall comply with the appropriate category specifications outlined in ANSI/TIA/EIA-568-B.1, -B.2 & -B.3 for the for the cable category in which connected and with this specification.
- B. Connection blocks shall be Type 110 and shall be properly mounted on backboards to facilitate cross-connection and/or inter-connection using patch cords.

2.5 PATCH PANELS

- A. Patch panels shall be as manufactured by Systimax or equivalent power sum rated at 1.5 amp or better as listed herein and shall comply with the appropriate category specifications outlined in ANSI/TIA/EIA-568-B.1 & -B.2 for the cable category in which connected and with this specification.
- B. Patch panels shall be Category 6, shall be installed to facilitate cross-connection and inter-connection using modular patch cords and shall conform to EIA standard, 19" rack mounting requirements.
- C. Provide 48 port patch panels with Systimax RJ-45 receptacles at each termination rack as follows:

One port per work area outlet cable terminated at the termination rack plus 25% spare. A minimum of 24 ports shall be provided at each termination rack. All ports provided whether connected in this project or are spare for future use shall have RJ-45 receptacle installed and ready for future connection.

- D. Patch panel shall be constructed of black anodized aluminum and shall have the following characteristic:
 - 1. 310 style insulation displacement connectors with quadrant pair isolation and a pyramid wire entry system.
 - 2. Backwards compatible to allow lower performing category cables or connecting hardware to be connected and perform at their full capacity.
 - 3. Rear protective strain relief caps with side or rear entry.
 - 4. Circuit boards tested in both directions.
 - 5. Have a rear cable management bar for strain relief.
 - 6. Port identification numbers on both the front and rear of the panel.
 - 7. Individual port labeling provisions.
 - 8. Support industry standards T568A and T568B wiring configurations.

2.6 TERMINATION RACKS

- A. Provide termination racks as required by the drawings and/or as required for the number of patch panels and fiber optic termination shelves to be provided. A maximum of two-thirds of the available mounting space in any rack shall be used for cable terminations. The remaining one-third of the available mounting space shall be dedicated for Owner provided electronics.
- B. Termination racks shall be open vertical floor mount, aluminum, two posts, with universal 19" EIA mounting with tapped holes and full mounting base as manufactured by B-line or equal as accepted. Rack height shall be 84".
- C. Termination racks shall be provided with vertical and horizontal cable management. Wire/cable management system shall be as manufactured by Panduit (Cat. No. WMPFIE). Vertical double hinged cable management shall be provided along entire length of vertical rails. Horizontal cable management shall be provided between each rack mounted component and above/below the top-most and bottom-most component, respectively. Floor mounted racks shall be provided with top waterfall type cable tray.
- D. Provide a rack mounted surge protection power strip with a minimum of six (6) receptacles, on/off switch and fifteen (15) foot cord & plug set.
- E. Termination racks shall be as manufactured B-line or approved equal.

2.7 WORK AREA CORDS/PATCH CORDS

- A. Provide data work area cords, one for each data receptacle installed plus 25% spare. Cords shall be factory made Category 6, five (5) feet in length with Systimax RJ-45 connector at each end, Allen Tel Cat. No. AT1505EV. Outer jacket color shall be the same as the corresponding horizontal cabling.
- B. Provide patch cords, one for each active port installed plus 25% spare. Cords shall be factory made Category 6, three (3) feet in length with Systimax RJ-45 connector at each end, Allen Tel Cat. No. AT1503EV. Outer jacket color of patch cords shall be the same as the corresponding horizontal cabling.

2.8 BACKBONE CABLING

- A. Copper and fiber optic backbone cabling shall be as manufactured by an approved cabling system manufacture as listed herein and shall comply with the specifications outlined in ANSI/TIA/EIA-568-B.1, -B.2, & -B.3 and with this specification.
- B. Telecommunication backbone cabling is existing multi-mode fiber optic cable 62.5/125 micron with of six (6) strands of fiber.

PART 3 – EXECUTION

3.1 HORIZONTAL CABLING SYSTEM – COPPER

- A. Telecommunication cabling shall be continuous (no splicing permitted) from the work area outlet receptacle termination to the designated backboard or patch panel termination. Work area cabling shall be installed in a "star" topology.

- B. A minimum of 12 inches of slack cable at the work area outlet, a 36 inch service loop left above each network drop zip tied above the ceiling and a minimum of 6 feet of slack cable at the termination cabinet/ rack/backboard shall be provided for all UTP cables. Slack cabling at the termination cabinet/ rack/backboard shall be properly stored in an extended loop or figure 8 configuration.
- C. Each Cable shall have all pairs properly terminated per the required category specifications at the work area outlet receptacle and at the backboard connection blocks or patch panel receptacle.
- D. Data station cables shall be terminated at the designated telecommunication room/closet on dedicated Category 6 patch panels.
- E. Cables shall be terminated at each outlet, patch panel, etc. using the wiring configuration as directed by the Owner.

3.2 CONNECTION BLOCKS

- A. Provide connection blocks at each backboard as follows:

One four pair cable termination for each work area outlet cable terminated at that backboard plus 50% spare.

3.3 TERMINATION RACKS

- A. Provide ladder rack for cable support from wall to the termination rack.
- B. Mount termination rack for maintenance access at front and rear. Maintain sufficient clearance for one (1) future additional termination rack to be mounted adjacent to the provided racks. Exact placement of each rack in the space shall be verified with the Professional and/or the Owner prior to rough-in.
- C. Each termination rack shall be bonded to the telecommunication ground bus using a #6 copper conductor. Ground conductor may be daisy-chained between multiple racks when installed side-by-side.

3.4 BACKBONE CABLING

- A. Backbone fiber optic cabling is existing and shall be modified per the plans.
- B. A minimum of ten (10) feet of slack cable shall be provided at each HC, IC and MC. Slack cabling shall be properly stored in an extended loop or figure 8 configuration.
- C. Unless otherwise noted on the drawings or herein specified, 100% of the backbone cabling pairs or strands shall be terminated.

3.5 CABLE TERMINATION

- A. Fiber optic backbone cables shall be terminated on dedicated termination panels.

3.6 CABLE ROUTING

- A. Telecommunication cables shall be routed utilizing the raceway system(s) as shown on the drawings, as specified in Section 260510 "Telecommunication Raceway System" and the requirements listed herein.

- B. Telecommunication cables shall be routed in compliance with the following requirements:
1. Cable shall be routed in corridors, where possible, consistent with the requirements as listed herein.
 2. Cable routing to follow the shortest distance between termination points consistent with the building construction constraints, telecommunication raceway system provided and the other requirements listed herein. Horizontal cable runs, regardless of media type, shall not exceed 295 feet (90 meters) from the work area outlet to the horizontal cross connection termination point including cable slack.
 3. Cable routing shall avoid arcing or rotating electrical equipment, transformers and/or ballast and any type of signal transmitting equipment. Maintain cable manufacturer's recommended clearance from any interference source given the cable installation method/media (conduit, cable tray, J-hooks, open, etc.)
 4. Where cables are routed open (without a conduit or other raceway system), provide cable supports (i.e. J-hooks, etc.) whether or not shown on the drawings or specified herein. Cable supports shall be mounted independent of the ceiling support system and spaced as recommended by the cable manufacturer and at a maximum of 5 feet on center. The number of cables placed in any support device shall be limited to the number of cables as recommended by the cable manufacturer or to the number of cables that will not cause a change in the geometric shape of any cable in the support.
 5. Cables shall be routed parallel and perpendicular to walls, ceilings and/or floors where possible. Cable homeruns from a common area and terminating at a common backboard or termination rack shall be group together. All cables shall be installed in a neat and workmanlike manner.
 6. Maintain the manufacturer's minimum bending radius during and after installation.
 7. Cable pulling tensions shall remain within the manufacturer's recommendation during and after installation.
 8. The Contractor shall plan and design each horizontal and/or backbone cable routing path from termination point to termination point taking into account and coordinating with all building systems and construction prior to the installation of any cable. Any cable installation as required by the drawings and this specification that can not meet the requirements as specified herein using the Telecommunication Structured Cabling System or Telecommunication Raceway System as specified herein shall be brought to the attention of the Professional prior to any cable or raceway installation.

3.7 LABELING

- A. On the face of each telecommunication work area outlet plate, permanently label each data receptacle with an identification number corresponding to the associated termination rack designation and patch panel and port number in which the outlet is connected.
- B. Each horizontal cable shall be identified on each end by an adhesive wrap around printed label indicating the associated room and work area receptacle/patch panel receptacle identification number.

- C. Patch panel receptacle numbering shall be sequential and consecutive across multiple patch panels when installed in a common rack or system of racks installed in the same room for the same system.
- D. Grounding cables shall be labeled and tagged at the bus bar.
- E. Service conduits and terminal rack feeder conduits shall be labeled.
- F. Telecommunication system labeling shall be fully explained to the Owner prior to installation and fully coordinated with the Owner's labeling requirements.

3.8 CABLE TESTING

- A. All copper horizontal cabling shall be tested for compliance with the associated category performance using an approved Level IIe or III balanced twisted-pair field test device. A printed test report of each cable tested shall be provided to the Professional at substantial completion.
- B. Horizontal balanced UTP Category 6 copper basic cable links shall be 100 percent tested according to ANSI/TIA/EIA-568-B.1. Test parameters shall include wire map, insertion loss, length, NEXT loss (pair-to-pair), NEXT loss (power sum), ELFEXT loss (pair-to-pair), ELFEXT loss (power sum), return loss, insertion loss, propagation delay, and delay skew.

3.9 BACKBONE - FIBER OPTIC

- A. Backbone Fiber optic cables shall be 100 percent tested for insertion loss and length. A printed test report of each cable tested shall be provided to the Professional at substantial completion.
- B. Insertion loss shall be tested at 850 nm or 1300 nm for 50/125 um and 62.5/125 um multimode cabling in at least one direction using the Method B (1 jumper) test procedure as specified in ANSI/TIA/EIA-526-14A. Length shall be tested using an OTDR.

3.10 WARRANTY

- A. The structured telecommunication cabling system shall be warranted by the System manufacturer for a minimum period of fifteen (15) years.

3.11 TELEVISION / VIDEO

- A. Horizontal video cable shall be provided from each video and/or television outlet to the designated telecommunication room, distribution equipment or other space as indicated.
- B. Horizontal video and television cable shall be RG-6.
- C. All horizontal cables shall be plenum rated.
- D. Video and television outlets shall be provided with Type F Connector properly connected to the associated cabling.
- E. The horizontal video and television cabling system shall be designed and installed in a homerun/star topology.

END OF SECTION

SECTION 28 00 10

SAFETY / SECURITY SYSTEMS

PART 1 - GENERAL

1.1 GOVERNING CLAUSE

- A. For the sake of brevity, these specifications may omit phrases such as "Contractor shall provide", "unless otherwise indicated or specified", etc., but these phrases are nevertheless implied. Mention of materials and operations requires the Contractor to furnish, install and connect such materials and perform such operations to provide a complete and operating system to the satisfaction of the Professional.

1.2 GENERAL CONDITIONS

- A. The General Conditions, Supplementary General Conditions, Information to Bidders, General Requirements, Addenda, Alternates and other pertinent documents issued by the Professional are a part of these specifications and shall be complied with in every respect.
- B. Notwithstanding any reference in the specifications to any equipment, material or type of construction by name, make or catalog number, such reference shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Where the phrase "or approved equal" is used in the Division 28 Specification, substitute equipment, equivalent in all respects to that specified, of any qualified manufacturer is permitted with the written approval of the Professional. Approval will not be considered until after award of contract and only if submitted by the successful Contractor. Where a list of manufacturers and/or catalog numbers is provided and the phrase "or approved equal" is omitted, substitute equipment, equivalent in all respects to that specified, from one of the listed manufacturers is permitted with the written approval of the Professional.

1.3 TEST AND OBSERVATIONS

- A. The complete project shall be, during and/or after construction, subject to the tests and observations as herein described and as noted on the drawings. Deficiencies found as a result of these tests and observations shall be corrected by the Contractor within a reasonable period and at no expense to the Owner.
- B. The complete project shall be subject to observations and tests conducted by the Professional or for him in his presence. Upon notice, the Contractor shall furnish not to exceed two men, one to include the job foreman, and tools to assist and be directed by the Professional for a reasonable amount of time to make such tests and observations as are requested by the Professional.
- C. The complete project shall be subject to observations and tests conducted by any Federal, State and/or local authority having jurisdiction. The Contractor shall make all corrections of any deficiencies required by the authority having jurisdiction to allow building occupancy.
- D. The complete project shall be subject to observations and tests conducted by the Owner's Insurance carrier. After inspection by this agency, Contractor shall make corrections of any deficiencies found adversely affecting the insurance to be carried by the Owner. Acceptance of this report or subsequent reports lie with the Professional or Owner.

1.4 RECORD DOCUMENTS

- A. The contractor shall provide to the Professional with the Close-Out Documents the following:
 - 1. Two (2) sets of blue line "as-built" prints of same scale as original drawings legibly marked in red showing all variations in the installed work from the requirements of the original contract drawings. The "as-built" drawings shall include all addenda, approved and installed change orders, field condition changes and other departures from the original plans and specifications.
 - 2. Three (3) sets of shop drawings and other data required by the specifications reflecting the manufacturer's shop fabrication of the materials actually installed. The Division 28 shop drawings shall be separately post bound, indexed and tabbed by specification section. Faxed or copies of faxed material shall NOT be used in Close-Out Documents.
 - 3. Operation and maintenance manuals and manufacturer's instructions for all equipment and systems installed.
 - 4. Copy of all reports of system, equipment or material test as required by this specification.

1.5 GUARANTEE

- A. The Contractor shall guarantee to the Owner all work performed under this contract to be free from defects in workmanship and materials for a period of one year from the date of final acceptance by the Professional and the Owner except as hereinafter noted.
- B. The Contractor shall correct, repair and/or replace upon notice from the Owner or his authorized representative within a reasonable period of time any defects in the work performed under this contract arising during the warranty period. This repair work shall be provided at no additional cost to the Owner.

1.6 ELECTRICAL SYSTEMS SCHEDULE

- A. Provide and connect all equipment and materials for complete and operative systems as follows:
 - Fire Detection & Alarm/Mass Notification System.
 - Miscellaneous Systems as shown on the drawings or stated herein.

1.7 GENERAL

- A. The Systems specified herein require specialized skill and experience in their installation and shall comply with the requirements of this Section of the Specifications.
- B. Each System shall be installed and connected in strict compliance with applicable codes and standards including NFPA, IBC, SBC, NEC, UL and ANSI.
- C. System(s) components and device locations shown on the drawings are approximate and representative and for estimating purposes only. Actual locations shall be coordinated with the architectural finishes encountered, other equipment and building structural elements. Component and device locations shall be properly located to provide maximum System performance in the room/space shown. All required mounting hardware and accessories shall be provided as required by the area and finishes encountered.

- D. Prior to component and/or device rough-in, the Company supplying the System(s) shall review the System(s) component and device locations, layout, etc. and make recommendations and any revisions necessary to facilitate maximum System performance. Proposed changes shall be shown and indicated on the System(s) one-line diagram(s).

PART 2 - PRODUCTS

2.1 EQUIPMENT

- A. System components shall be purchased from and supplied by a factory authorized company who maintains a complete inventory of spare parts and who has an active and experienced service organization capable of providing repair service within 24 hours of notification.
- B. Each component/device of the System(s) shall be UL listed. The installation of each component/device shall comply with the UL listing, applicable codes and standards, the manufacturer's recommendations and this specification.
- C. Component and device storage on the site shall include special precautions against temperature and humidity variations which exceed the manufacturer's recommendations. Any component or device which has been damaged due to storage conditions shall be repaired or replaced as directed by the Professional at no additional cost to the Owner.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. System installation shall be by factory-trained, well experienced technicians employed by the Company supplying the System components and devices. These technicians shall perform the following System installation procedures as a minimum:
 - 1. Perform all wiring connections at each component and device and all splices and/or terminations made at junction or pull boxes.
 - 2. Perform testing of all wiring after installation and prior to connection to components to verify System is free of grounded or open circuits.
 - 3. Perform complete System operational test. This test shall be completed prior to any third party testing required by this specification.
 - 4. Perform operation and maintenance training of installed System to Owner's personnel.
 - 5. Provide System certification letter to the Professional prior to Substantial Completion stating that the System has been installed and is operating in accordance with the applicable codes and standards, this specification and the manufacturer's recommendations.
- B. System wiring shall be installed in conduit unless otherwise shown or noted on the drawings or within this specification. Conduit and wiring though not shown on drawings shall be provided by the Contractor to accomplish the intent of the System as shown on the drawings by symbols and this specification.

- C. System design is intended to show types of devices, appliances, etc. and their associated functions and operations required for each space. Quantities, spacing and location of these devices, appliances, etc. to perform the intended function shall be the installing Contractor's responsibility and shall comply with applicable codes and standards and this specification.
- D. System wiring and equipment installation shall be in accordance with good engineering practices as established by the EIA/TIA and the NEC and with the manufacturer's recommendations. All wiring terminations and splices shall be made using proper compression type connectors or terminal strips. Wire nut type connectors of any kind shall not be used on System wiring.
- E. The Company supplying the System(s) shall submit to the Professional prior to Substantial Completion a letter on the Company letterhead for each System installed under the Special Systems provisions signed by their supervising technician(s) for this Project(s) stating that all component/device installations and all wiring connections, terminations and testing were performed by factory-trained technicians in the regular employment of the supplying Company.

3.2 TESTING AND DEMONSTRATION

- A. A representative of the Company supplying the System who is completely familiar with the operation, functions and maintenance of the installed System shall provide operation and maintenance training for the Owner on the System and the associated programming software. The representative shall inform the Owner of all the System's available operations and functions, and after consultation with the Owner, shall provide program adjustments to the System in order for it to perform per the Owner's request. Contractor shall allow one additional site visit during the one year warranty period for re-programming and/or re-configuring of the System(s) at the Owner's request at no additional cost to the Owner.
- B. This operation and maintenance training shall be fully coordinated and scheduled with the Owner and the Professional and shall be held at the convenience of the Owner. Contractor shall provide signed statement from the Owner's representative with Close-Out Documents on each System installed stating that the System was demonstrated to the Owner's satisfaction.
- C. The required operation and maintenance training session(s) on each System demonstrated shall be video taped by the Contractor and the tape submitted to the Professional with the Close Out Documents. The recording media shall be compatible for playback on a standard VHS format video cassette recorder (VCR). Any adapters or other interface devices required for playback shall be provided.
- D. Prior to the Project's Substantial Completion, the complete System(s) shall be tested and physically inspected by the installing technician(s) for proper operation and installation. Any deficiencies shall be corrected. This testing shall be performed prior to any third party testing required by other Sections of this Specification.

END OF SECTION

SECTION 28 00 30

EQUIPMENT/MATERIAL SUBMITTALS

PART 1 - GENERAL

1.1 GENERAL

- A. Equipment is specified by manufacturer's name and catalog number and is intended to establish the minimum standards of quality acceptable.
- B. Substitute equipment, equivalent in all respects to that specified, is permitted with the written approval of the Professional. Approval will not be considered until after award of contract and only if submitted by the successful Contractor.
- C. The manufacturer's name and/or catalog number first mentioned in this specification is considered to be the specified equipment. The "or equal" manufacturers mentioned or other manufacturers proposed by the Contractor shall be considered as substituted equipment.
- D. Substituted equipment shall meet the dimensional and functional requirements of the building as represented by the plans and specifications. All revisions to the contract precipitated by the use of substituted equipment shall be incorporated by the Contractor, after approval in writing by the Professional, and at no additional cost to the Owner.
- E. The Professional's approval of the shop drawings is only for general conformance with the design concept of the Project and the information given in the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site; information that pertains solely to the fabrication process or to the means and methods of construction; coordination of work of all trades; and performing all work in a safe and satisfactory manner. Approval of the shop drawings does not modify the Contractor's duty to comply with the Contract Documents. Any equipment or work found in the judgement of the Professional to be defective or otherwise unsuitable shall be repaired or replaced by the Contractor at no additional cost to the Owner.
- F. If requested in writing by the Professional, the Contractor shall submit a scale drawing (scale as directed by the Professional) of any electrical equipment area, conduit layout or the like which in the opinion of the Professional may present difficulty regarding space allocation or clearances.

1.2 SUBMITTALS

- A. After the project notice to proceed has been issued and with promptness to assure reasonable time for review with no delay to the project, the Contractor shall submit to the Professional a minimum of six (6) copies of shop drawings for all equipment and material for the electrical systems for approval whether or not substituted equipment or materials.
- B. Shop drawings shall be post-bound, indexed and tabbed per the appropriate specification sections. All material/equipment shop drawing cut sheets shall be properly located under the appropriate specification section. All shop drawings shall be originals (no faxed copies) and shall be readable without being removed from the bindings. All information listed on the shop drawings shall be typed. Handwritten information will not be accepted.
- C. Space shall be provided on the title or index page of each section of the shop drawings for the Professional's review stamp and comments. This space shall be clearly labeled as to its use and shall have a minimum size of 7" wide X 5" high.

- D. All submitted equipment/material and associated options, accessories, special features, etc. shall be clearly marked and indicated on all copies of the shop drawings. Provide appropriate shop drawings on all required accessory equipment.
- E. All shop drawings for all systems, equipment and materials including any required one-line drawings, diagrams, etc. shall be submitted together. Partial submittals will not be reviewed without prior consent. Special systems provided by specialized vendors or distributors may be submitted in a separate binder.
- F. Provide complete shop drawings with all pertinent information for each system specified and all required components.
- G. Special Systems submittals shall include a complete System one-line diagram prepared by the Company supplying the System components and devices.
- H. The one-line diagram shall show each component and device, all interconnecting wiring and conduit, terminal strips with numbering, pull and junction boxes, device zoning or device addresses where applicable and any other information which is deemed necessary by the Professional. The type, size and number of wires shall be shown for each interconnection circuit. The number and size of all conduits and boxes shall be identified on the drawing. The conduit routing and wiring shown on the one-line drawings shall accurately depict the actual installation of the System in the field.
- I. The one-line diagram drawings shall be produced using a commercially available CAD software program capable of producing electronic drawing files compatible with AutoCad software. Drawing symbols and lettering shall be neat and legible and printing line weights used shall clearly distinguish System components/devices from background floor or site plan elements. All lettering shall be upper case. When background drawing (floor plan, site plan, etc.) requires paper size to exceed 11"X17", the scale of the System one-line drawing shall be one-half the scale of the Contract Drawings and printed on the smallest adequate standard size paper.
- J. Three (3) copies of complete operational and maintenance manuals for each installed System shall be provided to the Professional with the Close-Out Documents. These manuals shall be post-bound and indexed and shall include catalog information, operating procedures in detail, wiring diagrams of all components, complete system one-line diagrams, and the address and phone number of the service department of the supplying Company.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 28 01 10

FIRE DETECTION AND ALARM SYSTEM
WITH MASS NOTIFICATION

PART 1 - GENERAL

1.1 CODES AND STANDARDS

- A. Provide all equipment, accessories, material and labor required to install and connect additional devices, connections and zones to the existing Fire Detection and Alarm System with Mass Notification in accordance with these specifications and applicable drawings to the complete satisfaction of the Professional. All material and/or equipment necessary for the proper operation of the System(s) not specified or described herein shall be deemed part of the specifications and shall be provided by the Division 28 Contractor.
- B. The new components added to the existing System(s) and their installation shall comply with the latest revisions all applicable codes and standards including NFPA, IBC, NEC and the Americans with Disabilities Act (ADA). Specifically the fire alarm system shall be installed per UFC 3 - 600 - 1 and NFPA 72.
- C. Each component of the System shall be listed under the appropriate category(ies) by Underwriters' Laboratories, Inc. (UL). The complete System installation shall conform to the applicable sections of NFPA-72, NEC 760, UFC, Local Code requirements and to the individual component's UL listings. Added components shall not adversely affect the U.L. listing(s) of the existing System.
- D. The requirements of Section 280010 "SAFETY/SECURITY SYSTEMS" and other applicable sections of this Specification shall apply and shall be fully complied with.
- E. System installation including all wiring connections, splices and terminations at all devices, panels, components, junction points, etc. and testing of installed wiring shall be performed by factory trained and certified personnel of the System manufacturer and/or NICET Level 3 certified personnel.
- F. System(s) components and device locations shown on the drawings are approximate and representative and are intended to establish the type of protection, monitoring or alarm notification required for the associated room, space and/or area. The final and actual number of devices, their coverage and/or output rating and their locations shall be determined by the System manufacturer to provide full coverage of the intended function of the area in accordance with NFPA 72. Locations of components and devices shall be fully coordinated with the architectural finishes encountered, other equipment and building structural elements. Additional devices required for proper operation of the System shall be shown on the submitted System one-line drawings.

1.2 SCOPE OF WORK

- A. Provide and connect new devices, components and/or connections to the existing Fire Detection and Alarm System with Mass Notification, hereinafter referred to as the "System" in this section of the specifications.

1.3 CONTRACTOR QUALIFICATIONS

- A. The System Contractor, hereinafter referred to as the "Contractor" in this section of the specifications, shall be an experienced company with local representation regularly engaged in the design and installation of fire detection and alarm systems of similar size and complexity as required for this project and have the following minimum qualifications:
 - 1. Personnel factory trained and certified in the design of the System to be provided.
 - 2. Personnel factory trained and certified to install and connect the System components to be provided.
 - 3. Personnel knowledgeable in local, state, province and national codes and regulations.
 - 4. Possess required licenses/permits to perform required installations in the jurisdiction in which the project is located.
 - 5. Operating as a business under the same name currently being used for a minimum of five (5) years.
- B. Provide with the System(s) shop drawings a copy of all certifications and registrations of the Contractor's personnel that will be involved with the design and/or installation of the System(s).
- C. At the request of the Professional, the System Contractor shall provide in writing references of a minimum of three successfully completed projects of similar size and complexity as this project which have been completed by this Contractor in the three year period preceding this project's bid date. References shall include project name, location, Owner's contact person and telephone number.

PART 2 - PRODUCTS

2.1 CONTROL PANEL(S)

- A. All additional control panel interior components and/or expansion cabinets and associated interior components added to existing System shall be manufactured by the existing control panel manufacturer. Other manufacturers will be considered only if entire Fire Alarm System Control Panel(s) are replaced with new manufacturer's equipment. Division 26 Contractor shall be responsible for visiting site and verifying the availability of required additional zones in existing control panel and/or if the existing System can be expanded to accommodate the required additional components and/or zones. All expansion components shall be provided and connected by the Division 28 Contractor. If existing system can not be expanded, Division 28 Contractor shall provide and connect new control panel(s) of proper capacity and similar features as existing System.
- B. All wiring shall be installed in a neat and workmanlike manner with conductors routed parallel or perpendicular to sides and/or back of the enclosure and properly tie wrapped and bundled. All wiring shall be properly labeled.

- C. Required modifications to the System(s) operational programming for the new devices, components, connections, etc. and specified operational functions shall be provided by certified factory-trained technician(s) and shall be customized for the facility(ies) in which the system(s) is/are installed per this specifications and applicable codes. Addressable device display labels where applicable shall be programmed for plain language readout per the direction of the Owner/Professional. Device display labels shall include associated room numbers in which the device is located and the room numbers shall be taken from the final room number designations issued by the Owner/Professional.
- D. A System smoke sensor as specified herein shall be provided and connected in each room/space where a FACP is located whether or not the device(s) is/are shown on the drawings. Where conditions of the room/space dictate for proper operation, a thermal detector may be substituted for the smoke sensor with approval by the Professional.

2.2 SYSTEM POWER

- A. The capacities of the existing FACP(s) power supply(ies) and back-up batteries shall be upgraded as required for proper System operation for the total number of devices and components connected.
- B. Standby battery(ies) shall be sealed, maintenance free type complete with appropriate charger(s) and shall be provided and connected as required to operate the complete System plus required spare capacities for 24 hours with 5 minutes of alarm operation at the end of this period. Standby batteries shall be located in the same cabinet as the associated FACP or immediately adjacent to the FACP cabinet in a separate cabinet.
- C. Provide with the shop drawings complete battery calculations for both the alarm and supervisory power requirements for the System(s).

2.3 AUDIBLE and VISUAL ALARM DEVICES

- A. Unless shown or noted otherwise, visual alarm devices shall be semi-flush, wall mounted devices with red housing and two strobes and audible/visual alarm devices shall be semi-flush, wall mounted devices with red housing, speaker and two strobes.
- B. Alarm strobes for audible/visual and visual alarm devices shall utilize a xenon flash tube with polycarbonate lens. One strobe shall be used for fire alarm notification and shall be white in color with "FIRE" lettering; the other strobe shall be used for mass notification alarm and shall be amber in color. The fire alarm and mass notification devices for audible and visual alarms shall be mounted on a common backbox. All strobe flash rates shall be synchronized. Audible/Visual alarm devices shall be equal to Cooper Notification (Wheelock) Model Number E70-24MCW-FW/RSSPA-24MCC-NW/SBL2/ISP2. Visual alarm devices shall be equal to Cooper Notification (Wheelock) Model Number RSSP-24MCW-FW/RSSPA-24MCC-NW/SBL2.
- C. Visual alarm devices provided in rooms (with the exception of corridors/hallways) whose effective rectangular (length X width) dimensions (measured from the longest points) exceed 20'L X 20'W shall have a light output of 110 candela. Visual alarm devices in corridors and other spaces shall have a light output of 15/75 candela unless noted otherwise on the drawings.
- D. Audible alarm speakers shall be 2 watt with a minimum of four power taps. Alarm speakers shall be located throughout the facility as required to provide intelligible alarm messages in all occupied spaces. Where additional speakers are required to achieve required sound levels or intelligibility, flush ceiling mounted speakers may be used where building finishes permit.

2.4 ALARM SPEAKERS (Mass Notification)

- A. Speakers shall be weather proof type with adjustable aiming mounting hardware. Speakers shall have a maximum output of 10 watts with a minimum of four power taps.

2.5 SMOKE SENSORS

- A. Shall be analog photoelectric type, addressable and shall be provided as shown or noted on the drawings and/or as specified herein.
- B. Smoke sensors shall be ceiling mounted unless otherwise shown or noted on the drawings or herein specified. Ceiling mounted sensors shall not be less than 4 inches from a sidewall to the near edge. Wall mounted sensors shall be mounted at least 4 inches but not more than 12 inches below the ceiling.
- C. Smoke sensor locations shown on the drawings are approximate and representative. Sensors shall be located as required for proper operation, as recommended by the manufacturer, in compliance with NFPA 72 and to provide optimum coverage of the space installed. Sensors shall not be located in direct air flow or within 36 inches of an air supply diffuser.
- D. Smoke sensors shall not be installed until after construction clean up or shall be provided with the proper covers to prevent the migration of debris into the sensor.

2.6 THERMAL SENSORS

- A. Shall be analog, fixed temperature and rate-of-rise sensing, 135 degree unless noted otherwise, addressable and shall be provided as shown or noted on the drawings and/or as specified herein.

2.7 DUCT MOUNTED SMOKE SENSORS

- A. Shall be analog, addressable photoelectric type smoke sensors with duct housings, sampling tubes, etc. and shall be provided and properly installed at air handling duct systems as specified herein.

2.8 CONTROL/MONITOR MODULES

- A. Control/monitor modules shall be individually addressable and shall be capable of configuration for latching or momentary contact operation. The operation and function of each contact shall be separately programmable at the FACP.
- B. Control/monitor modules shall have the minimum number of interface contacts or contact monitoring circuits to perform the function or operation specified or required. Where the number of interfaces exceeds the available number of contacts in a single module, multiple modules shall be provided as required.

2.9 AIR HANDLING UNIT DETECTORS

- A. The duct mounted smoke detectors shall be provided with all required NC & NO contacts or zone addressable control module which shall be used by the Mechanical Contractor for air handling unit shut down. The operation of each contact shall be programmable within the System operational program. Programmable sensor base(s) and/or proper addressable control module(s) shall be provided as required. Interface wiring and connection requirements for air handling unit shut down shall be the responsibility of the Mechanical Contractor.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. System wiring shall be installed in conduit. Conduit and wiring though not shown on drawings shall be provided by the Contractor to accomplish the intent of the System as shown on the drawings by symbols, as specified herein and as required to comply with governing codes and standards.
- B. System wiring and equipment installation shall be in accordance with good engineering practices as established by the EIA/TIA and the NEC and with the manufacturer's recommendations. All wiring terminations, splices and junctions shall be made using proper compression type connectors or terminal strips. Wire nut type connectors of any kind shall not be used on System wiring.
- C. System wiring shall the following class and style designations as defined by NFPA 72 and shall initiate the proper signal per NFPA 72 at the FACP(s) and remote annunciators: Initiating Device Circuits (IDC) - Class B, Style A; Signaling Line Circuits (SLC) - Class B, Style 0.5; Notification Appliance Circuits (NAC) - Class B, Style W.
- D. System wiring shall the following class and style designations as defined by NFPA 72 and shall initiate the proper signal per NFPA 72 at the FACP(s) and remote annunciators: Initiating Device Circuits (IDC) - Class A, Style D; Signaling Line Circuits (SLC) - Class A, Style 6; Notification Appliance Circuits (NAC) - Class A, Style Z. The System wiring shall be installed such that the outgoing and return conductors, exiting from and returning to the control unit, respectively, are routed separately and in a manner such that probable damage to one circuit would not affect the operation of the other circuit.
- E. The System and associated components shall be protected against transient over voltages in accordance with the applicable requirements of ANSI/IEEE C62.41 by proper devices installed on incoming power circuits and all circuits routed outdoors or terminated on devices located outdoors.

3.2 AUDIBLE and VISUAL ALARM DEVICES

- A. Audible/visual and visual alarm devices shall be provided and connected throughout the facility(ies) located as shown on the drawings and as required to produce audible and visual alarms in accordance with NFPA 72, ADA, UFC 4-021-01 and the Contract Documents.
- B. Visual alarm devices shall be mounted center line up 80" above the finished floor unless otherwise shown or noted on the drawings or herein specified.

3.3 ALARM SPEAKERS (Mass Notification)

- A. Horn type speakers shall be installed as shown on the drawings to provide intelligible alarm messages in the spaces within the building(s) as shown and around the perimeter of each building for a distance of 85 feet from each building.

3.4 SMOKE SENSORS

- A. Smoke sensors shall be ceiling mounted unless otherwise shown or noted on the drawings or herein specified. Ceiling mounted sensors shall not be less than 4 inches from a sidewall to the near edge. Wall mounted sensors shall be mounted at least 4 inches but not more than 12 inches below the ceiling.

- B. Smoke sensor locations shown on the drawings are approximate and representative. Sensors shall be located as required for proper operation, as recommended by the manufacturer, in compliance with NFPA 72 and to provide optimum coverage of the space installed. Sensors shall not be located in direct air flow or within 36 inches of an air supply diffuser.
- C. Smoke sensors shall not be installed until after construction clean up or shall be provided with the proper covers to prevent the migration of debris into the sensor.

3.5 THERMAL SENSORS

- A. Thermal sensors shall be ceiling mounted unless otherwise shown or noted on the drawings or herein specified. Ceiling mounted sensors shall not be less than 4 inches from a sidewall to the near edge. Wall mounted sensors shall be mounted at least 4 inches but not more than 12 inches below the ceiling.
- B. Thermal sensor locations shown on the drawings are approximate and representative. Sensors shall be located as required for proper operation, as recommended by the manufacturer, in compliance with NFPA 72 and to provide optimum coverage of the space installed. Sensors shall not be located in direct air flow or within 36 inches of an air supply diffuser.

3.6 CONTROL/MONITOR MODULES

- A. Control/monitor modules shall be provided as shown and/or noted on the drawings and/or as required for system interfaces as specified herein.

3.7 AIR HANDLING UNITS.

- A. Duct mounted smoke sensors as specified herein and required accessories shall be provided, connected and properly installed at air handling duct systems in the main supply duct on the downstream side of filters and in the return duct prior to exhausting from the building or the introduction of outside air of designated air handling units.
- B. Division 28 Contractor shall review Mechanical drawings and specifications for air handling unit locations, areas served, duct work routing, etc.
- C. The sensors shall be provided with all required NC & NO contacts or zone addressable control module which shall be used by the Mechanical Contractor for air handling unit shut down. The operation of each contact shall be programmable within the System operational program. Programmable sensor base(s) and/or proper addressable control module(s) shall be provided as required. Interface wiring and connection requirements for air handling unit shut down shall be the responsibility of the Mechanical Contractor.

3.8 HVAC SHUT DOWN

- A. The System shall be properly interfaced with the HVAC control system(s) to shut down all air moving equipment (i.e. air handling units, ventilation fans, etc.) upon activation of the associated push button at an Operator Control Panel or upon activation of an appropriate mass notification alarm.
- B. Provide and connect all addressable control modules, relays, etc. with all required NC & NO contacts which shall be used by the Mechanical Contractor for air handling equipment shut down. The operation of each contact shall be programmable within the System operational program. Interface wiring and connection requirements for air handling unit shut down shall be the responsibility of the Mechanical Contractor.

3.9 FIRE EXTINGUISHING SYSTEM(S)

- A. The necessary addressable control/monitoring devices shall be provided and properly connected to supervise and accept general alarm initiation signal(s) produced by the following:
 - 1. Range/exhaust hood fire extinguishing system.
- B. Addressable control modules shall be provided and connected and properly interfaced with the associated system(s) as required to perform shunt-trip of the power branch circuit(s) serving the power connection(s) and/or device(s) required to be de-energized in an alarm condition by the governing codes.

3.10 BASIC SYSTEM OPERATION

A. ALARM INITIATION

- 1. Actuation of any initiation new device or new interface device shall cause the following actions:
 - a. Activate general alarms (audible and visual).
 - b. Display individual initiating device address and description at control panel(s) and remote annunciator(s) where the existing System has this function and capabilities.
 - c. Provide activation signals and interfaces to other systems as herein specified.
 - d. Transmit signal over telephone lines to central fire reporting station via communicator where the existing System has this function and capabilities.
 - e. Record the event in the historical log where the existing System has this function and capabilities.
- 2. The new connected devices and associated circuitry shall be properly connected to the System per the remanufacturer's recommendations for supervision of the devices, connections and associated wiring and shall initiate a supervisory or trouble notification as required by NFPA 72 for the associated wiring classification. A supervisory or trouble signal shall initiate the associated audible and visual alarms at the associated FACP and remote annunciator(s) and shall record the event in the historical log where the System has this function.

3.11 TESTING & DEMONSTRATION

- A. See Section 280010 "Safety/Security System" for additional testing and demonstration requirements.
- B. The installed and/or modified Fire Detection and Alarm System(s) and all associated devices and connections shall be tested in accord with the manufacturer's recommendations, applicable codes and standards, and testing guidelines as herein specified. Testing shall be performed by an independent, third-party Company qualified to test the system involved. Testing Company qualifications shall be submitted to the Professional for approval prior to the beginning of testing.

- C. A full test report as outlined in this specification shall be submitted to the Professional in writing prior to substantial completion. Where System(s) operations involve other Divisions of the Specifications, the affected Professional shall verify by signed written statement that the operation performed by the System(s) specified herein was correct and complete. Retesting as necessary to achieve a complete report(s) with no deficiencies shall be required. The Professional will perform random component testing at Substantial Completion at his discretion. Should any part of the System(s) not perform correctly, a complete re-test of the entire System(s) can be required with no additional or increase in Cost to the Owner. If more than one re-check of the System(s) by the Professional is required to verify proper System(s) operation, the Contractor will be billed for the time and expense of the Professional.
- D. A System Record of Completion as required and published in NFPA 72 shall be completed by the installing Contractor and submitted to the Owner and a copy of the report shall be included with the Close-Out Documents.

3.12 EQUIPMENT

- A. Rough-in requirements (conduit, boxes, etc.) for all components, devices, etc. shall be as recommended by the System manufacturer and per applicable codes for the situation encountered.
- B. The component/device quantities, locations, etc. shown on the drawings and/or specified herein are intended to indicate the type of devices and associated sensing requirements in each room/space. The actual quantity, spacing, locations, etc. of devices and components shall be the responsibility of the System provider per his System's design requirements and limitations, applicable codes and standards, and the contract documents.
- C. The System components and devices specified herein are for estimating purposes. The installed new components shall be the same in function and appearance as existing similar units and fully compatible with the existing System unless indicated otherwise. Quantities shall be as shown on the drawings, as defined in this specification and/or as required for proper System operation per the drawings and this specification. All cables shall be as recommended by the system manufacturer or exact equal.

END OF SECTION

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

PROCUREMENT AND CONTRACTING FORMS

DIVISION 50

S E C T I O N 9 0 5 - P R O P O S A L

Date _____

Mississippi Transportation Commission
Jackson, Mississippi

Sirs: The following proposal is made on behalf of _____
_____ of _____

_____ for constructing the following designated project(s) within the time(s) hereinafter specified.

The plans are composed of drawings and blue prints on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

The Specifications are the current Standard Specifications of the Mississippi Department of Transportation approved by the Federal Highway Administration, except where superseded or amended by the plans, Special Provisions and Notice(s) to Bidders attached hereto and made a part thereof.

I (We) certify that I (we) possess a copy of said Standard and any Supplemental Specifications.

Evidence of my (our) authority to submit the Proposal is hereby furnished. The proposal is made without collusion on the part of any person, firm or corporation. I (We) certify that I (we) have carefully examined the Plans, the Specifications, including the Special Provisions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Specifications, Special Provisions, Notice(s) to Bidders, and Plans, I (we) propose to furnish all necessary machinery, tools, apparatus and other means of construction and do all the work and furnish all the materials in the manner specified. I (We) understand that the quantities mentioned herein are approximate only and are subject to either increase or decrease, and hereby propose to perform any increased or decreased quantities of work at the unit prices bid, in accordance with the above.

Attached hereto is a certified check, cashier's check or Proposal Guaranty Bond in the amount as required in the Advertisement (or, by law).

INSTRUCTION TO BIDDERS: Alternate and Optional Items on Bid Schedule.

1. Two or more items entered opposite a single unit quantity WITHOUT DEFINITE DESIGNATION AS "ALTERNATE ITEMS" are considered as "OPTIONAL ITEMS". Bidders may or may not indicate on bids the Optional Item proposed to be furnished or performed WITHOUT PREJUDICE IN REGARD TO IRREGULARITY OF BIDS.
2. Items classified on the bid schedule as "ALTERNATE ITEMS" and/or "ALTERNATE TYPES OF CONSTRUCTION" must be preselected and indicated on bids. However, "Alternate Types of Construction" may include Optional Items to be treated as set out in Paragraph 1, above.
3. Optional items not preselected and indicated on the bid schedule MUST be designated in accordance with Subsection 102.06 prior to or at the time of execution of the contract.
4. Optional and Alternate items designated must be used throughout the project.

I (We) further propose to perform all "force account or extra work" that may be required of me (us) on the basis provided in the Specifications and to give such work my (our) personal attention in order to see that it is economically performed.

I (We) further propose to execute the attached contract agreement (Section 902) as soon as the work is awarded to me (us), and to begin and complete the work within the time limit(s) provided for in the Specifications and Advertisement. I (We) also propose to execute the attached contract bond (Section 903) in an amount not less than one hundred (100) percent of the total of my (our) part, but also to guarantee the excellence of both workmanship and materials until the work is finally accepted.

I (We) enclose a certified check, cashier's check or bid bond for **five percent (5%) of total bid** and hereby agree that in case of my (our) failure to execute the contract and furnish bond within Ten (10) days after notice of award, the amount of this check (bid bond) will be forfeited to the State of Mississippi as liquidated damages arising out of my (our) failure to execute the contract as proposed. It is understood that in case I am (we are) not awarded the work, the check will be returned as provided in the Specifications.

SECTION 905 -- PROPOSAL (CONTINUED)

I (We) hereby certify by execution of the Section 905 proposal below, that all certifications, disclosures and affidavits incorporated herein are deemed to be duly executed in the aggregate, fully enforceable and binding upon delivery of the bid proposal. I (We) further acknowledge that this certification shall not extend to the bid bond or alternate security which must be separately executed for the benefit of the Commission. This signature does not cure deficiencies in any required certifications, disclosures and/or affidavits. I (We) also acknowledge the right of the Commission to require full and final execution on any certification, disclosure or affidavit contained in the proposal at the Commission's election upon award. Failure to so execute at the Commission's request within the time allowed in the Standard Specifications for execution of all contract documents will result in forfeiture of the bid bond or alternate security.

Respectfully Submitted,

DATE _____

Contractor

BY _____
Signature

TITLE _____

ADDRESS _____

CITY, STATE, ZIP _____

PHONE _____

FAX _____

E-MAIL _____

(To be filled in if a corporation)

Our corporation is chartered under the Laws of the State of _____ and the names, titles and business addresses of the executives are as follows:

President Address

Secretary Address

Treasurer Address

The following is my (our) itemized proposal.

Renovation at Hattiesburg U.S. Army Reserve Center, known as State Project No. SP-0210-00(025) / 101212307 in Forrest County.

I (We) agree to complete the entire project within the specified contract time.

*****SPECIAL NOTICE TO BIDDERS*****

**BIDS WILL NOT BE CONSIDERED UNLESS BOTH PRICES AND ITEM TOTALS ARE ENTERED.
 BIDS WILL NOT BE CONSIDERED UNLESS THE BID CERTIFICATION LOCATED AT THE END OF THE BID SHEETS IS SIGNED**

*****BID SCHEDULE*****

Line No.	Item Code	Adj Code	Quantity	Units	Description	Unit Price		Item Amount	
						Dollar	Ct	Dollar	Ct
Building Items									
0010	1510-A001		1	Lump Sum	RenovateUS Army Reserve Center	XXXXXXX	XXX		

*** BID CERTIFICATION ***

TOTAL BID.....\$ _____

*** BID STATEMENT ***

BIDDER ACKNOWLEDGES THAT HE/SHE HAS CHECKED ALL ITEMS IN THIS PROPOSAL FOR ACCURACY AND CERTIFIED THAT THE FIGURES SHOWN THEREIN CONSTITUTE THEIR OFFICIAL BID.

BIDDER'S COMPANY

BIDDER'S FEDERAL TAX ID NUMBER

CONDITIONS FOR COMBINATION BID

If a bidder elects to submit a combined bid for two or more of the contracts listed for this month's letting, the bidder must complete and execute these sheets of the proposal in each of the individual proposals to constitute a combination bid. In addition to this requirement, each individual contract shall be completed, executed and submitted in the usual specified manner.

Failure to execute this Combination Bid Proposal in each of the contracts combined will be just cause for each proposal to be received and evaluated as a separate bid.

COMBINATION BID PROPOSAL

I. This proposal is tendered as one part of a Combination Bid Proposal utilizing option ___* of Subsection 102.11 on the following contracts:

* Option to be shown as either (a), (b), or (c).

<u>Project No.</u>	<u>County</u>	<u>Project No.</u>	<u>County</u>
1. _____	_____	6. _____	_____
2. _____	_____	7. _____	_____
3. _____	_____	8. _____	_____
4. _____	_____	9. _____	_____
5. _____	_____	10. _____	_____

A. If option (a) has been selected, then go to II, and sign Combination Bid Proposal.

B. If option (b) has been selected, then complete the following, go to II, and sign Combination Bid Proposal.

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
1. _____	_____ _____	_____ _____	_____ _____	_____ _____	
2. _____	_____ _____	_____ _____	_____ _____	_____ _____	
3. _____	_____ _____	_____ _____	_____ _____	_____ _____	
4. _____	_____ _____	_____ _____	_____ _____	_____ _____	
5. _____	_____ _____	_____ _____	_____ _____	_____ _____	
6. _____	_____ _____	_____ _____	_____ _____	_____ _____	
7. _____	_____ _____	_____ _____	_____ _____	_____ _____	
8. _____	_____ _____	_____ _____	_____ _____	_____ _____	

SECTION 905 - COMBINATION BID PROPOSAL (Continued)

Project Number	Pay Item Number	Unit	Unit Price Reduction	Total Item Reduction	Total Contract Reduction
9. _____	_____ _____	_____ _____	_____ _____	_____ _____	
10. _____	_____ _____	_____ _____	_____ _____	_____ _____	

C. If option (c) has been selected, then initial and complete one of the following, go to II. and sign Combination Bid Proposal.

_____ I (We) desire to be awarded work not to exceed a total monetary value of \$ _____.

_____ I (We) desire to be awarded work not to exceed _____ number of contracts.

II. It is understood that the Mississippi Transportation Commission not only reserves the right to reject any and all proposals, but also the right to award contracts upon the basis of lowest separate bids or combination bids most advantageous to the State.

It is further understood and agreed that the Combination Bid Proposal is for comparison of bids only and that each contract shall operate in every respect as a separate contract in accordance with its proposal and contract documents.

I (We), the undersigned, agree to complete each contract on or before its specified completion date.

TO: EXECUTIVE DIRECTOR, MISSISSIPPI DEPARTMENT OF
TRANSPORTATION
JACKSON, MISSISSIPPI

CERTIFICATE

If awarded this contract, I (we) contemplate that portions of the contract will be sublet. I (we) certify that those subcontracts which are equal to or in excess of fifty thousand dollars (\$50,000.00) will be in accordance with regulations promulgated and adopted by the Mississippi State Board of Contractors on September 8, 2011.

I (we) agree that this notification of intent DOES NOT constitute APPROVAL of the subcontracts.

_____ (Individual or Firm)	_____ (Address)
_____ (Individual or Firm)	_____ (Address)
_____ (Individual or Firm)	_____ (Address)
_____ (Individual or Firm)	_____ (Address)

NOTE: Failure to complete the above DOES NOT preclude subsequent subcontracts. Subsequent subcontracts, if any, equal to or in excess of fifty thousand dollars (\$50,000.00) will be in accordance with regulations promulgated and adopted by the Mississippi State Board of Contractors on January 13, 1999.

Contractor _____

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

CERTIFICATION

I, _____,
(Name of person signing certification)

individually, and in my capacity as _____ of
(Title)

(Name of Firm, Partnership, or Corporation)

do hereby certify under penalty of perjury under the laws of the United States and the State of Mississippi that

_____, Bidder
(Name of Firm, Partnership, or Corporation)

on Project No. SP-0210-00(025)/101212307,

in Forrest County(ies), Mississippi, has not either directly or indirectly entered into any agreement, participated in any collusion; or otherwise taken any action in restraint of free competitive bidding in connection with this contract; nor have any of its corporate officers or principal owners.

Except as noted hereafter, it is further certified that said legal entity and its corporate officers, principal owners, managers, auditors and others in a position of administering federal funds are not currently under suspension, debarment, voluntary exclusion or determination of ineligibility; nor have a debarment pending; nor been suspended, debarred, voluntarily excluded or determined ineligible within the past three years by the Mississippi Transportation Commission, the State of Mississippi, any other State or a federal agency; nor been indicted, convicted or had a civil judgment rendered by a court of competent jurisdiction in any matter involving fraud or official misconduct within the past three years.

Initial here _____ if exceptions are attached and made a part thereof. Any exceptions shall address to whom it applies, initiating agency and dates of such action.

Note: Exceptions will not necessarily result in denial of award but will be considered in determining bidder responsibility. Providing false information may result in criminal prosecution or administrative sanctions.

All of the foregoing and attachments (when indicated) is true and correct.

(5/29/2008S)

S E C T I O N 9 0 2

CONTRACT FOR **SP-0210-00(025)/101212307**

LOCATED IN THE COUNTY(IES) OF **Forrest**

STATE OF MISSISSIPPI,
COUNTY OF HINDS

This contract entered into by and between the Mississippi Transportation Commission on one hand, and the undersigned contractor, on the other witnesseth;

That, in consideration of the payment by the Mississippi Transportation Commission of the prices set out in the proposal hereto attached, to the undersigned contractor, such payment to be made in the manner and at the time of times specified in the specifications and the special provisions, if any, the undersigned contractor hereby agrees to accept the prices stated in the proposal in full compensation for the furnishing of all materials and equipment and the executing of all the work contemplated in this contract.

It is understood and agreed that the advertising according to law, the Advertisement, the instructions to bidders, the proposal for the contract, the specifications, the revisions of the specifications, the special provisions, and also the plans for the work herein contemplated, said plans showing more particularly the details of the work to be done, shall be held to be, and are hereby made a part of this contract by specific reference thereto and with like effect as if each and all of said instruments had been set out fully herein in words and figures.

It is further agreed that for the same consideration the undersigned contractor shall be responsible for all loss or damage arising out of the nature of the work aforesaid; or from the action of the elements and unforeseen obstructions or difficulties which may be encountered in the prosecution of the same and for all risks of every description connected with the work, exceptions being those specifically set out in the contract; and for faithfully completing the whole work in good and workmanlike manner according to the approved Plans, Specifications, Special Provisions, Notice(s) to Bidders and requirements of the Mississippi Department of Transportation.

It is further agreed that the work shall be done under the direct supervision and to the complete satisfaction of the Executive Director of the Mississippi Department of Transportation, or his authorized representatives, and when Federal Funds are involved subject to inspection at all times and approval by the Federal Highway Administration, or its agents as the case may be, or the agents of any other Agency whose funds are involved in accordance with those Acts of the Legislature of the State of Mississippi approved by the Governor and such rules and regulations issued pursuant thereto by the Mississippi Transportation Commission and the authorized Federal Agencies.

The Contractor agrees that all labor as outlined in the Special Provisions may be secured from list furnished by

It is agreed and understood that each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and this contract shall be read and enforced as though it were included herein, and, if through mere mistake or otherwise any such provision is not inserted, then upon the application of either party hereto, the contract shall forthwith be physically amended to make such insertion.

The Contractor agrees that he has read each and every clause of this Contract, and fully understands the meaning of same and that he will comply with all the terms, covenants and agreements therein set forth.

Witness our signatures this the _____ day of _____, _____.

Contractor (s)

By _____

MISSISSIPPI TRANSPORTATION COMMISSION

Title _____

By _____

Signed and sealed in the presence of:
(names and addresses of witnesses)

Executive Director

Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of _____, _____, Minute Book No. _____, Page No. _____.

S E C T I O N 9 0 3
PERFORMANCE AND PAYMENT BOND

CONTRACT BOND FOR: SP-0210-00(025)/101212307

LOCATED IN THE COUNTY(IES) OF: Forrest

STATE OF MISSISSIPPI,
COUNTY OF HINDS

Know all men by these presents: that we, _____
(Contractor)

_____ Principal, a _____

residing at _____ in the State of _____

and _____
(Surety)

residing at _____ in the State of _____,

authorized to do business in the State of Mississippi, under the laws thereof, as surety, effective as of the contract date shown below, are held and firmly bound unto the State of Mississippi in the sum of _____

_____ (\$ _____) Dollars, lawful money of the United States of America, to be paid to it for which payment well and truly to be made, we bind ourselves, our heirs, administrators, successors, or assigns jointly and severally by these presents.

The conditions of this bond are such, that whereas the said _____

_____ principal, has (have) entered into a contract with the Mississippi Transportation Commission, bearing the date of _____ day of _____ A.D. _____ hereto annexed, for the construction of certain projects(s) in the State of Mississippi as mentioned in said contract in accordance with the Contract Documents therefor, on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

Now therefore, if the above bounden _____

_____ in all things shall stand to and abide by and well and truly observe, do keep and perform all and singular the terms, covenants, conditions, guarantees and agreements in said contract, contained on his (their) part to be observed, done, kept and performed and each of them, at the time and in the manner and form and furnish all of the material and equipment specified in said contract in strict accordance with the terms of said contract which said plans, specifications and special provisions are included in and form a part of said contract and shall maintain the said work contemplated until its final completion and acceptance as specified in Subsection 109.11 of the approved specifications, and save harmless said Mississippi Transportation Commission from any loss or damage arising out of or occasioned by the negligence, wrongful or criminal act, overcharge, fraud, or any other loss or damage whatsoever, on the part of said principal (s), his (their) agents, servants, or employees in the performance of said work or in any manner connected therewith, and shall be liable and responsible in a civil action instituted by the State at the instance of the Mississippi Transportation Commission or any officer of the State authorized in such cases, for double any amount in money or property, the State may lose or be overcharged or otherwise defrauded of, by reason of wrongful or criminal act, if any, of the Contractor(s), his (their) agents or employees, and shall promptly pay the said agents, servants and employees and all persons furnishing labor, material, equipment or supplies therefor, including premiums incurred, for Surety Bonds, Liability Insurance, and Workmen's Compensation Insurance; with the additional obligation that such Contractor shall promptly make payment of all taxes, licenses, assessments, contributions, damages,

any liquidated damages which may arise prior to any termination of said principal's contract, any liquidated damages which may arise after termination of the said principal's contract due to default on the part of said principal, penalties and interest thereon, when and as the same may be due this state, or any county, municipality, board, department, commission or political subdivision: in the course of the performance of said work and in accordance with Sections 31-5-51 et seq. Mississippi Code of 1972, and other State statutes applicable thereto, and shall carry out to the letter and to the satisfaction of the Executive Director of the Mississippi Department of Transportation, all, each and every one of the stipulations, obligations, conditions, covenants and agreements and terms of said contract in accordance with the terms thereof and all of the expense and cost and attorney's fee that may be incurred in the enforcement of the performance of said contract, or in the enforcement of the conditions and obligations of this bond, then this obligation shall be null and void, otherwise to be and remain in full force and virtue.

_____ (Contractors) Principal	_____ Surety
By _____	By _____ (Signature) Attorney in Fact
	Address _____ _____ _____
Title _____ (Contractor's Seal)	_____ (Printed) MS Agent
	_____ (Signature) MS Agent
	Address _____ _____ _____
	_____ (Surety Seal)
	_____ Mississippi Insurance ID Number



BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____
Contractor

Address

City, State ZIP

as Principal, hereinafter called the Principal, and _____
Surety

a corporation duly organized under the laws of the state of _____

as Surety, hereinafter called the Surety, are held and firmly bound unto State of Mississippi, Jackson, Mississippi

As Obligee, hereinafter called Obligee, in the sum of **Five Per Cent (5%) of Amount Bid**

Dollars (\$ _____)

for the payment of which sum will and truly to be made, the said Principal and said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for **Renovation at Hattiesburg U.S. Army Reserve Center, known as State Project No. SP-0210-00(025) / 101212307 in Forrest County.**

NOW THEREFORE, the condition of this obligation is such that if the aforesaid Principal shall be awarded the contract, the said Principal will, within the time required, enter into a formal contract and give a good and sufficient bond to secure the performance of the terms and conditions of the contract, then this obligation to be void; otherwise the Principal and Surety will pay unto the Obligee the difference in money between the amount of the bid of the said Principal and the amount for which the Obligee legally contracts with another party to perform the work if the latter amount be in excess of the former, but in no event shall liability hereunder exceed the penal sum hereof.

Signed and sealed this _____ day of _____, 20__

(Principal) (Seal)

(Witness) By: _____
(Name) (Title)

(Surety) (Seal)

(Witness) By: _____
(Attorney-in-Fact)

MS Agent

Mississippi Insurance ID Number