PROPOSAL AND CONTRACT DOCUMENTS

FOR THE CONSTRUCTION OF

(EXEMPT)

14
Work necessary to renovate the Welcome Center on northbound Interstate 55 in Pike County, known as State Project No. BWO-7078-57(002) / 501415, in the County of Pike, State of Mississippi.
Project Completion: October 31, 2005

NOTICE

BIDDERS MUST PURCHASE A BOUND PROPOSAL
FROM MDOT CONTRACT ADMINISTRATION DIVISION
TO BID ON 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
MISSISSIPPI DEPARTMENT OF TRANSPORTATION
JACKSON, MISSISSIPPI

BIDDER CHECK LIST
(FOR INFORMATION ONLY)

_____ 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.

_____ If the bid sheets were prepared using MDOT's Electronic Bid System, proposal sheets have been stapled and inserted into the proposal package.

_____ First sheet of SECTION 905--PROPOSAL has been completed.

_____ Second sheet of SECTION 905--PROPOSAL has been completed and signed.

_____ 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.

_____ DBE/WBE percentage, when required by contract, has been entered on last sheet of the bid sheets of SECTION 905 - PROPOSAL.

_____ Form OCR-485, when required by contract, has been completed and signed.

_____ The last sheet of the bid sheets of SECTION 905--PROPOSAL has been signed.

_____ Combination Bid Proposal of SECTION 905--PROPOSAL has been completed for each project which is to be considered in combination (See Subsection 102.11).

_____ Equal Opportunity Clause Certification, when included in contract, has been completed and signed.

_____ Subcontract Certificate, when included in contract, has been completed and signed.

_____ The Certification regarding Non-Collusion, Debarment and Suspension, etc. has been executed in duplicate.

_____ 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. Bid bond has been signed by the bidder and has also been signed or countersigned by a Mississippi Resident Agent for the Surety with Power of Attorney attached or on file with the Department's Contract Administration Engineer.

_____ 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.

(09/2004)

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

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PIKE COUNTY, MISSISSIPPI

PROJECT NUMBER: **BWO-7078-57(002) 501415**

DATE: **9-7-04**

DESCRIPTION A: This Work shall consist of all construction work necessary in constructing the Renovations to Pike County Welcome Center on the Northbound side of Interstate 55 for District Seven at Pike 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.

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END OF DOCUMENT

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

ADVERTISEMENT FOR BIDS
DOCUMENT 00100

Sealed bids will be received by the Mississippi Transportation Commission in the Office of the Contract Administration Engineer, Mississippi Department of Transportation Office Building, Jackson, Mississippi, until 9:30 o'clock A.M., Tuesday, October 26, 2004. Thereafter bids will be received in the First Floor Auditorium of the Mississippi Department of Transportation Office Building, Jackson, Mississippi, until 10:00 o'clock A.M., Tuesday, October 26, 2004, and shortly thereafter publicly opened for

Construction necessary to build Renovations to Welcome Center on I-55 (Northbound), Pike County, Mississippi, known as Project No. BWO-7078-57(002) 501415.

The attention of bidders is directed to the Contract Provisions governing selection and employment of labor. Minimum wage rates have been predetermined by the Secretary of Labor and are subject to Public Law 87-581, Work Hours Act of 1962, as set forth in the Contract Provisions.

The Mississippi Department of Transportation hereby notifies all bidders that it will affirmatively insure that in any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, sex, religion or national origin in consideration for an award.

Drawings and Specifications are on file in the offices of the Mississippi Department of Transportation at McComb and Jackson.

Bid or specimen proposals must be acquired from the Contract Administration Engineer Division, First Floor of Mississippi Department of Transportation Office Building, Telephone (601) 359-7744. These proposals are available at a cost of Ten Dollars ($10.00) per proposal.

Plans may be acquired on a cost per sheet basis from MDOT Plans Print Shop, Room 1100, Administration Building, 401 North West Street, Jackson, Mississippi 39201, Telephone (601) 359-7460, FAX (601) 359-7461, E-mail plans@mdot.state.ms.us.

Bid Bond, signed or countersigned by a Mississippi Resident Agent, with Power of Attorney attached or on file with the Contract Administration Engineer of the Department, a Cashier's check or Certified Check for five (5%) percent of bid, payable to STATE OF MISSISSIPPI, must accompany each proposal.

The attention of bidders is directed to the provisions of Document 00200 - Instructions to Bidders pertaining to irregular proposals and rejection of bids.

LARRY L."BUTCH" BROWN
EXECUTIVE DIRECTOR

(SPWP)

END OF DOCUMENT

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

PRE-BID MEETING
DOCUMENT 00150

PROJECT: **Renovations To Welcome Center On I-55 (Northbound) Pike County, Mississippi**

PROJECT NUMBER: **BWO-7078-57(002) 501415**

DATE: **September 7, 2004**

PART 1 GENERAL

1.01 DESCRIPTION

A. Bidders are hereby advised that this Project provides for a Pre-Bid Meeting.

B. This Meeting will be held in the Welcome Center at the MDOT Pike County Welcome Center located on I-55 Northbound, near Nicholson, Mississippi, telephone (601) 684-2111, **at 3:00 P.M. on Tuesday, October 19, 2004**. Prospective bidders are encouraged to attend to discuss requirements of the Drawings and Specifications for this Project, to request clarifications or additional information to the Documents, and to visit the Project site.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF DOCUMENT

INSTRUCTIONS TO BIDDERS
DOCUMENT 00200

Part 1 GENERAL

1.01 **QUESTIONS**: General questions should be directed to Jim Vinson, the MDOT Architect (601) 359-7292. Should a Bidder find Discrepancies in or omissions from the Drawings or Project Manual, or be in doubt as to their meaning, the Bidder should immediately notify the MDOT Architect. The MDOT Architect will send written instruction(s) or interpretation(s) to all known holders of the Documents. Neither the Owner, nor the MDOT Architect, will be responsible for any oral instruction or interpretation.

1.02 **BIDDER'S QUALIFICATIONS**:

A. **Certificate of Responsibility**: The Mississippi State Board of Contractors is responsible for Issuing Certificates of Responsibility to Contractors. To be awarded a Contract for public work, Sections 31-3-15 and 31-3-21 of the Mississippi Code 1972, Annotated requires a Contractor to have a current Certificate of Responsibility at bid time and during the entire length of the job. The Certificate of Responsibility number issued becomes a significant item in all public bidding.

B. **Bid Under $50,000**: If a Bidder submits a bid not exceeding $50,000, no Certificate of Responsibility number is required; however, a notation stating the bid does not exceed $50,000 must appear on the face of the envelope, or a Certificate of Responsibility number.

C. **Bid Over $50,000**: Each Bidder submitting a bid in excess of $50,000 must show its Certificate of Responsibility number on the bid and on the face of the envelope containing the bid.

D. **Joint Venture Bid**: When multiple Contractors submit a joint venture bid in excess of $50,000, a joint venture Certificate of Responsibility number must be shown on the bid and on the face of the envelope containing the bid. If the Multiple-Contractor joint venture has no joint venture Certificate of Responsibility number, each of the Contractors participating in the bid must indicate their individual Certificate of Responsibility numbers on the bid and on the face of the envelope.

1.03 **NON-RESIDENT BIDDER:** When a non-resident Bidder (a Contractor whose principal place of Business is outside the State of Mississippi) submits a bid for a Mississippi public works project, one of the following is required and shall be submitted with the Proposal Form:

A. **Copy of Law**: If the non-resident Bidder's state has a resident Bidder preference law, a copy of that law shall be submitted with the Proposal Form.

B. **Statement**: If the state has no such law then a statement indicating the State of (Name of State) has no resident Contractor preference law shall be submitted with the Proposal Form.

1.04 **DISQUALIFICATION OF BIDDER:** A Bidder may be disqualified for having defaulted on a previous Contract.

1.05 **CONDITIONS OF WORK**: Each Bidder must fully inform himself 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.

1.06 **EXAMINATION OF SITE**: All Bidders, including the general Contractor and Subcontractors shall visit the building site, compare the Drawings and Project Manual with any work in place and informed of all conditions. Failure to visit the site will in no way relieve the successful Bidder from furnishing any materials or performing any work required to complete Work in accordance with Drawings and Project Manual (Proposal) without additional cost to the Owner.

1.07 **LAWS AND REGULATIONS**: The Bidder's attention is directed to the fact that all applicable Mississippi state laws, rules and regulations of all authorities having jurisdiction over construction of the Project apply to the Contract.

1.08 **OBLIGATION OF BIDDER**: At the bid opening, each Bidder will be presumed to have inspected the site, read and become thoroughly familiar with the Drawings and the Project Manual (Proposal) including all addenda.

1.09 **BID DOCUMENT**: 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.

Part 2 PROPOSAL FORM

2.01 **METHOD OF BIDDING**: Lump sum, single bids received on a general contract will include general, mechanical and electrical construction and all work shown on Drawings or specified in the Project Manual (Proposal).

2.02 **PROPOSAL FORMS**: The Bidder shall make all proposals on forms provided and shall fill all applicable blank spaces without interlineation or alteration and must not contain recapitulation of the work to be done. No oral or telegraphic proposals will be considered.

2.03 **TIME OF COMPLETION:** The Bidder shall agree to commence work on, or before a date specified in a written ***Notice to Proceed*** and fully complete the Project within the calendar days indicated on the Proposal Form.

2.04 **SUBSTIUTIONS**: 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 01630 entitled *Product Options and Substitution Procedures* which covers procedures after the award of Contract.

2.05 **ADDENDA**: Any 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. The Proposal Form will have ample space to indicate the receipt of addenda. When completing the Proposal Form. The Bidder shall list the Addendum number and the date received in spaces provided.

2.06 **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 the same as the name appearing in the current Mississippi State Board of Contractors Roster.

C. **Legal Address**: The address appearing on the Proposal Form should be the same address appearing in the current Mississippi State Board of Contractors Roster.

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.

2.07 **BID SECURITY**: The Bid Security shall be in the form of a Bid Bond, or a Certified Check:

A. **Bid Bond**: The Bidder may submit a Bid Bond by a Surety licensed in Mississippi in the amount of five percent (5%) of the base bid. The Bidder, the Surety and a Mississippi resident agent shall duly execute the Bid Bond. (No standard form is required for the Bid Bond.)

B. **Certified Check**: The Bidder may submit a certified check made out to the STATE OF MISSISSIPPI in the amount of five percent (5%) of the base bid. All checks received from Bidders will be returned upon request, unless a Bidder is one (1) of the three (3) apparent low Bidders. The three (3) apparent low Bidder's checks will be held for forty-five (45) days, unless a Contract is awarded and executed in less time.

2.08 **POWER OF ATTORNEY**: Each bid security must be accompanied by an appropriate Power of attorney.

Part 3 SUBMITTING THE PROPOSAL FORM

3.01 **SUBMITTAL**: This Proposal, which includes the Bid Forms and Specifications, must have all applicable parts completely filled out and delivered in its entirety to the address indicated on the Advertisement for Bids prior to the time and date stated.

A. **DO NOT** remove any part of the Contract Documents (Exception – An addendum requires substitution of second sheet of Document 00400).

B. Failure to complete all of the applicable requirements may be cause for the Proposal to be considered irregular.

C. **A stripped Proposal that is not re-assembled in its correct order is considered as an irregular bid and will be rejected**.

D. The Proposal shall be submitted and sealed in the opaque envelope provided and mailed or hand-delivered.

If the Bid is mailed, the bid envelope shall be placed inside a second envelope to prevent inadvertent premature opening of the Proposal. The second mailing envelope shall have the notations "**SEALED BID ENCLOSED"** on the face thereof.

3.02 **MODIFICATION TO BID**: A Bidder may **not** modify the bid prior to the scheduled closing time indicated in the Advertisement for Bids in the following manner:

A. **Notification on Envelope**: A modification may **not** be written on the outside of the sealed envelope containing the bid.

B. **Facsimile**: A facsimile (fax) will **not** be acceptable.

3.03 **WITHDRAWAL OF BID**: Any bid may be withdrawn prior to the scheduled time for opening of bids. However, bids may not be withdrawn until sixty (60) days after bid opening.

Part 4 BID OPENING AND AWARD OF CONTRACT

4.01 **OPENING OF BIDS**: Bids will be publicly opened shortly after the time stated in the advertisement for Bids. Bidder representatives are invited; however, attendance is not mandatory.

4.02 **IRREGULARITIES**: The omission of any information requested on the Proposal Form may be considered as an informality, or irregularity, by the awarding public body when in their opinion the omitted information does not alter the amounts contained in the submitted bid proposal, or place other Bidders at a disadvantage.

4.03 **PROTEST**: Any protest must be delivered in writing to the Owner within twenty-four (24) hours after the bid opening.

4.04 **ERRORS**: 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.

4.05 **AWARD OF CONTRACT**: The Owner reserves the right to reject any, or all bids. A Contract will be awarded on the basis of the low base bid, or low combination of base bid and those alternates selected by the Owner in any order determined to be in the best interest of the Mississippi Transportation Commission and which produces a total within available funds.

4.06 **FAILURE TO ENTER INTO A CONTRACT**: The Bidder shall forfeit the Bid Security to the Owner as liquidated damages for failure, or refusal, to execute and deliver the Contract, Bond and Certificate of Insurance within the required ten (10) days after notice of the acceptance of the bid.

4.07 **SECURITY FOR FAITHFUL PERFORMANCE**: Simultaneously, with delivery of the executed Contract, the Contractor shall furnish a Surety Bond, or Bonds, as security for faithful performance, the payment of all persons performing labor on the project and furnishing materials in connection with this Contract. The Surety on such Bond or Bonds shall be a duly authorized surety company satisfactory to the Owner and meeting all of the following requirements:

A. Licensed at the time of award by the State of Mississippi's Commissioner of Insurance for the purpose of providing surety.

B. Listed at the time of award in the Department of the Treasury's Federal Register as a company holding certificates of authority as acceptable sureties on Federal Bonds, commonly referred to as the Treasury List.

C. All Bonds shall be executed on the form provided in the Project Manual under Document 00600 entitled *Contract Bond.*

D. A Mississippi resident agent with the name and address typed, or lettered legibly shall countersign all Bonds.

E. All Bonds must be accompanied by an appropriate Power of Attorney.

Part 5 BIDDER'S CHECKLIST

5.01 **PROPOSAL FORM**

Base Bid
( ) Write in the amount of the base bid in numbers.

Alternates
( ) Write in each alternates amount in words and numbers.

Addenda
( ) Acknowledge the receipt of each addendum by writing in the number of the addendum and the date received.

Certification Form
( ) Certification (regarding Non-Collusion, Debarment and Suspension, etc.) Form has been executed in duplicate.

Acceptance
( ) Proposal is signed by authorized person.
( ) Name of Business as it appears in the current Mississippi State Board of Contractors Roster.
( ) Legal address of the business listed above.
( ) Correct Certificate of Responsibility Number(s) as it appears in the current Mississippi State Board of Contractors Roster.

Certificate of Responsibility Number(s)
( ) Base Bid is under $50,000 and no number is required.
( ) Base Bid is under $50,000 and the statement "bid does not exceed $50,000" is on the outside of the sealed envelope.
( ) Base Bid is over $50,000 and number is required.
( ) Joint Venture and *joint venture* number is required.
Or
( ) Joint Venture participants' numbers are required.

5.02 **BID SECURITY**
( ) Included Bid Bond.
Or
( ) Included Certified Check payable to the STATE OF MISSISSIPPI.

5.03 **POWER OF ATTORNEY**
( ) Included Power of Attorney

5.04 **NON-RESIDENT BIDDER**

( ) Attached a Copy of Non-Resident Bidder's Preference Law
Or
( ) Attached a Statement

Part 6 BIDDER'S CONTACT LIST

6.01 **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:

A.	Additional Proposals	Emma Taylor – Contract Administration	(601) 359-7744
B.	Additional Prints	Clint Wells – MDOT Plans Print Shop	(601) 359-7460
C.	Bid Forms	Contract Administration Engineer	(601) 359-7730
D.	Specifications	Jim Vinson – MDOT Architect	(601) 359-7292
E.	Drawings	Jim Vinson – MDOT Architect	(601) 359-7292

F. Bidder's List & Specimen Proposals are available online at:
http://www.gomdot.com/business/bids/adv/default.htm

*** END OF DOCUMENT ***

NOTICE TO BIDDERS
DOCUMENT 00300

Part 1 GENERAL

1.01 **WORK IN PROXIMITY OF HIGH VOLTAGE POWER LINES:** Bidders are hereby advised of Section 45-15-1, et seq., Mississippi Code of 1972, regarding the performance of work in the proximity of high voltage overhead power lines. It is the Contractor's responsibility to comply with those statutory requirements.

1.02 **AGENCY, COMMISSION AND OFFICER NAME CHANGES**

A. Whenever the term "Mississippi State Highway Department", the word "Department", or variations thereof meaning the Mississippi State Highway Department appears in the plans, proposal, contract documents, and specifications for highway construction projects, in accordance with the laws of the State of Mississippi, it shall mean the "Mississippi Department of Transportation.

B. Whenever the term "Mississippi State Highway Commission", the word "Commission", or variations thereof meaning the Mississippi State Highway Commission appears in the plans, proposal, contract documents, and specifications for highway construction projects, in accordance with the laws of the State of Mississippi, it shall mean the "Mississippi Transportation Commission".

C. Whenever the term "Director", or variations thereof meaning the Chief Administrative Officer of the State Highway Department appears in the plans, proposal, contract documents, and specifications for highway construction projects, in accordance with the laws of the State of Mississippi, it shall mean the "Executive Director of the Mississippi Department of Transportation."

1.03 **PLANT PEST QUARANTINES INFORMATION:** AT the request of the U. S. Department of Agriculture, Plant Pest Control Information Concerning Domestic Quarantines is cited as follows:

A. The entire state of Mississippi has been quarantined for the Imported Fire Ants. Soil and soil-moving equipment operating in the state will be subject to plant quarantine regulations. In general, these regulations provide for cleaning soil from equipment before it is moved from the state. Complete information may be secured from the State of Mississippi Department of Agriculture and commerce, Bureau of Plant Industry, P.O. Box 5207, Mississippi State, Mississippi 39762-5207 – Telephone 325-3390.

<u>IMPORTED FIRE AN QUARANTINES</u>

THE FOLLOWING REGULATED ARTICLES REQUIRE A CERTIFICATE OR PERMIT FOR MOVEMENT:

1. Soil, separately or with other things, except soil samples shipped to approved laboratories*. Potting soil is exempt, if commercially prepared, packaged and shipped in original containers.
2. Plants with roots with soil attached, except houseplants maintained indoors and not for sale.
3. Grass sod.
4. Baled hay and straw that have been stored in contact with the soil.
5. Used soil-moving equipment.

6. Any other products, articles, or means of conveyance of any character whatsoever not covered by the above, when it is determined by an inspector that they present a hazard of spread of the imported fire ant and the person in possession thereof has been so notified.

* Information as to designated laboratories, facilities, gins, oil mils, and processing plants may be obtained from an inspector.

Consult your State or Federal plant protection Inspector or your county agent for assistance regarding exact areas under regulation and requirements for moving regulated articles. For detailed information see 7 CFR 301.81 for quarantine and regulations.

1.04 **FUEL TAX APPLICABILITY TO BIDDERS AND CONTRACTORS:** Bidders are hereby advised that the Mississippi Code of 1972, section 27-55-301 et seq. requires the use of taxed diesel fuel used in performing contracts for construction, reconstruction, maintenance, or repair where such contracts are entered into with the State of Mississippi, any agency, department, institution, or political subdivision thereof. Section 27-55-313 reads as follows:

A. A tax at the rate of Eighteen Cents (18¢) per gallon until the date specified in Section 65-39-35, and Fourteen and Three-fourths Cents (14.75¢) per gallon thereafter, is levied upon any delivering other motor fuel to a retail dealer, user or any other person for use in propelling motor vehicles on the highways of this state and/or for the privilege of engaging in the business of selling and delivering other motor fuel to any other person who purchases or uses other motor fuel in performing contracts for construction, reconstruction, maintenance or repairs, where such contracts are entered into with the State of Mississippi, any political subdivision of the State of Mississippi, or any department, agency or institution of the State of Mississippi or any political subdivision thereof.

B. A tax at the rate described in this section is hereby levied upon any person who purchases, receives or acquires any other motor fuel upon which the tax has not been paid when such other motor fuel is used for any taxable purpose as set forth in this article. A tax at the rate described in this section is hereby levied upon any retailer who purchases, receives, or acquires any other motor fuel upon which the tax has not been paid when such other motor fuel is sold for use or used for any taxable purpose as set forth in this article.

C. The commission may adopt rules and regulations providing for the issuance of permits to persons performing contracts as hereinabove provided, allowing or requiring said persons to purchase other motor fuel for use in performing said contracts without the payment to the distributor of the tax imposed hereunder, and providing for such persons to report and pay such tax directly to the commission in instances where the commission determines that such payment will facilitate and expedite the collection of the tax which may be due on such purchases by the permittee. The distributor is relieved of collecting and remitting the taxes specified hereunder, when furnished with a copy of said permit, and the person holding the permit shall become liable for such taxes instead of the seller, and the full enforcement provisions of this article shall apply in the collection of the tax from the permittee. The commission may require said person to execute and file with the commission a good and valid bond in a surety company authorized to do business in this state, or with sufficient sureties to be approved by the commission, conditioned that all taxes which may accrue to the State of Mississippi under the provisions of this chapter will be paid when due. Provided further, the commission may accept a bond filed under the provision of Section 27-65-21, when such bond is conditioned upon the payment of taxes hereunder.

D. Any person who shall, while not licensed as a distributor of other motor fuel or retail dealer, sell or deliver to other persons any other motor fuel upon which the tax levied by this article has not been paid shall be liable for the tax and penalties imposed by this article if the person selling or delivering such fuel knows or has reason to know that it will be used or sold for a taxable purpose.

E. A retail dealer may, with the approval of the commission, sell or dispense tax free other motor fuel. Said retailer shall comply with all rules and regulations pertaining to retailers selling or dispensing tax free other motor fuel. The commission may require said retailer to execute and file with the commission a good and valid bond, in a surety company authorized to do business in the state, conditioned that all taxes which may accrue to the State of Mississippi under the provisions of this chapter will be paid when due. Storage tanks or pumps located at all such retail dealers' place of business which are used or to be used in storing and dispensing kerosene for lamps, stoves, heaters and domestic purposes shall bear the label "not for highway use" of letters of not less than four (4) inches in height.

F. When other motor fuel on which the full tax under this section has been paid has been Delivered to a retail dealer for sale or to a consumer for use as motor fuel for operating a motor vehicle upon the highways of this state, the distributor of other motor fuel who made said tax payments and deliveries may pick up and return to his bulk storage facility any portion of such other motor fuel which may be unused and claim credit for the amount of tax paid on the quantity so returned. In order to claim credit for the tax on the quantity of other motor fuel to be so returned, such distributor shall notify the commission of his desire to so return it. Such transaction shall only be made under the supervision of the commission.

G. When dyed diesel fuel and clear diesel fuel are accidentally mixed and the mixture is converted to nonhighway use diesel fuel, the distributor or other person owning such mixture may claim credit for the highway portion of the tax paid on such mixture. Proof satisfactory to the distributor or other person owning such mixture shall notify the commission immediately after gaining knowledge that such accidental mixture has occurred.

Bidders/Contractors are required to comply with the provisions of said section, and any revisions or amendments thereto, for all work performed under this contract; and be able to substantiate compliance when requested by the Mississippi Department of Transportation or the Mississippi State Tax Commission.

1.05 **PROMPT PAYMENT**

A. Bidders are hereby advised that the Prime Contractor must pay their subcontractor(s) for satisfactory performance of their contracts no later than a specific number of days from receipt of payment from the Department. Therefore, Prime Contractors are hereby advised of the following:

1. Within 15 calendar days after receiving payment from the Department for work satisfactorily performed, the Prime Contractor shall make prompt payment to all sub-contractors or material suppliers for all monies due.
2. Within 15 calendar days after receiving payment from the Department for work satisfactorily completed, the Prime Contractor shall promptly return all retainage monies due to all sub-contractors or material suppliers.

1.06 ALTERATIONS IN BIDDING PROCESS

A. Bidders are hereby advised that they may either use the traditional method of entering their Bid information by hand on Proposal Document 00400 (Section 905, dated 2/28/01, MDOT – Edited for Building Projects) or may insert printed information obtained from the available Electronic Bid System (EBS).

B. It is the responsibility of every bidder to check for any addendum or modification to the contract document(s) for which they intend to submit a response. It shall be the bidder's responsibility to be sure they are in receipt of all addenda, pre-bid conference information, and/or questions and answers provided at, or subsequent to, the pre-bid conference, if any are issued.

The Mississippi Transportation Commission assumes no responsibility for defects, irregularities or other problems caused by the use of electronic media. Operation of this electronic media is done at the sole risk of the user.

1.07 CONTRACT TIME

A. I t is anticipated that the Notice to Proceed will be issued by not later than November 29, 2004, ant the date for beginning of Contract Time will be December 9, 2004.

B. The calendar date for completion of this Contract shall be October 31, 2005 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 01310 of these Specifications will be required.

1.08 SUBCONTRACTING

A. 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:

Specialty Items

Roofing Items
Plumbing Items
Heating, Ventilating and Air Conditioning Items
Electrical Items

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

END OF DOCUMENT

PROPOSAL
DOCUMENT 00400

(Section 905, dated 2/28/01, MDOT – Edited for Building Projects)

Date _____

Mississippi Transportation Commission
Jackson, Mississippi

Sirs: The following proposal is made on behalf of_____
(Company Name)
of_____
(Company Street Address)
_____
(Company City, State, & Zip Code)

For constructing the following designated project(s) within the time(s) hereinafter specified.

The Contract Documents are composed of the Project Manual (Proposal) and the Drawings on file in the offices of the Mississippi Department of Transportation, Jackson, Mississippi.

I (We) certify that I (we) possess a copy of said Contract Documents.

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 Contract Documents, including the Instructions and Notice(s) to Bidders, herein, and have personally examined the site of the work. On the basis of the Contract Documents, Instructions and Notice(s) to Bidders, 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.

Attached hereto is a certified check, cashier's check or Proposal Guaranty Bond in the amount as required in the Advertisement (or, by law).

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 Contract Documents 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 (Document 00500) 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 Contract Documents and Advertisement. I (We) also propose to execute the attached Contract Bond (Section 00600) 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
(Amount)_____ $_____) Dollars
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.

Bidder acknowledges receipt of and has added to and made a part of the proposal and contract documents the following addendum (addenda):

ADDENDUM NO._____DATED_____ADDENDUM NO._____DATED_____
ADDENDUM NO._____DATED_____ADDENDUM NO._____DATED_____
ADDENDUM NO._____DATED_____ADDENDUM NO._____DATED_____

TOTAL ADDENDA: _____
(Must agree with total addenda issued prior to opening of bids)

Respectfully submitted, _____
(Contractor)

BY_____
(Signature)

TITLE_____

ADDRESS_____
(Street Address)

ADDRESS_____
(City, State & Zip Code)

Date _____, _____

(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.

WORK NECESSARY FOR CONSTRUCTION OF RENOVATIONS TO WELCOME CENTER ON I-55 (NORTHBOUND), KNOWN AS STATE PROJECT BWO-7078-57(002) 501415, IN THE COUNTY OF PIKE, STATE OF MISSISSIPPI.

I (We) agree to complete the entire Project within the specified Contract Time.

*****SPECIAL NOTICE TO BIDDERS*****

BIDS WILL NOT BE CONSIDERED UNLESS ITEM TOTALS ARE ENTERED AND THE BID CERTIFICATE (DOCUMENT 00604) LOCATED AT THE END OF THE BID SHEETS IS SIGNED

REF. NO.	PAY ITEM NO.	UNIT	DESCRIPTION	ITEM TOTAL
(10)		lump sum	Construction of Renovations to Welcome Center on I-55 (Northbound) Pike County ……$_____	

TOTAL BID……$_____

*****SIGNATURE 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 SIGNATURE

*****END OF DOCUMENT*****

AGREEMENT
DOCUMENT 00500
(Section 902, dated 2/28/01, MDOT – Edited for Building Projects)

CONTRACT FOR	Project No. BWO-7078-57(002) 501415 Renovation to Welcome Center on I-55 (Northbound)
LOCATED IN THE COUNTY OF STATE OF MISSISSIPPI, COUNTY OF HINDS	Pike

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 Contract Documents, 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 Contract Documents, 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 Contract Documents 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.

It is agreed and understood that each and every provision of law and clause required by 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) Company Name

By_____
(Signature)

Title_____
Signed and sealed in the presence of:
(Names and address of witnesses)

_____

_____

MISSISSIPPI TRANSPORTATION COMMISSION

By_____
Executive Director

_____ _____
Secretary to the Commission

Award authorized by the Mississippi Transportation Commission in session on the ____ day of

_____, _____ Minute Book No. _____, Page No._____

*****END OF DOCUMENT*****

CONTRACT BOND
DOCUMENT 00600
(Section 903, dated 2/28/01, MDOT – Edited for Building Projects)

CONTRACT BOND FOR: BWO-7078-57(002) 501415
Renovation to Welcome Center on I-55 (Northbound)

LOCATED IN THE COUNTY OF: Pike

STATE OF MISSISSIPPI,
COUNTY OF HINDS

Know all men by these presents: that we, _____

_____Principal, a _____

residing at _____in the State of _____

and_____

residing at _____in the State of _____

authorized to do business in the State of Mississippi, under the laws thereof, as surety, 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.

Signed and sealed this the _____day of _____A.D._____.

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 project(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 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 statues 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.

Witness our signatures and seals this the _____day of _____ A.D. _____

_____	_____
(Contractors) Principal	(Surety)
By_____	By_____
(Signature)	(Signature) Attorney in Fact
	_____
Title_____	_____
(Contractor's Seal)	(Name and address of local (Mississippi) representative (Surety Seal)

*****END OF DOCUMENT*****

NON-COLLUSION CERTIFICATION

DOCUMENT 00602

(Non-Collusion Certification, dated 2/28/01, MDOT – Edited for Building Projects)

(Execute in duplicate)

State of Mississippi

County of_____

I,_____,
(Name of person signing Certification)

individually, and in my capacity as_____
(Title)

_____do hereby certify under
(Name of Company, Partnership, or Corporation)

penalty of perjury under the laws of the United States and the State of Mississippi that

_____, Bidder
(Name of Company, Partnership, or Corporation)

on Project No. BWO-7078-57(002) 501415, on I-55 Northbound, Pike County, 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.

Executed on _____ _____
(Date) (Signature)

END OF DOCUMENT

NON-COLLUSION CERTIFICATION

DOCUMENT 00602

(Non-Collusion Certification, dated 2/28/01, MDOT – Edited for Building Projects)

(Execute in duplicate)

State of Mississippi

County of_____

I,_____,
(Name of person signing Certification)

individually, and in my capacity as_____
(Title)

_____do hereby certify under
(Name of Company, Partnership, or Corporation)

penalty of perjury under the laws of the United States and the State of Mississippi that

_____, Bidder
(Name of Company, Partnership, or Corporation)

on Project No. BWO-7078-57(002) 501415, on I-55 Northbound, Pike County, 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.

Executed on _____ _____
(Date) (Signature)

END OF DOCUMENT

TO: EXECUTIVE DIRECTOR, MISSISSIPPI DEPARTMENT OF TRANSPORTATION
JACKSON, MISSISSIPPI

CERTIFICATE

DOCUMENT 00604

(Certificate, dated 2/28/01, MDOT – Edited for Building Projects)

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 January 13, 1999.

I (We) agree that this notification of intent DOES NOT constitute APPROVAL of the subcontracts.

NOTE: Insert name and address of subcontractors. (Subcontracts equal to or in excess of fifty thousand dollars ($50,000.00) ONLY.)

_____ (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_____
(Name of Company, Partnership, or Corporation)

By_____
(Signature)

Title_____

CERTIFICATE MUST BE EXECUTED

*****END OF DOCUMENT*****

HAUL PERMIT FOR BRIDGES WITH POSTED LOAD LIMITS

DOCUMENT 00605

(Haul Permit for Bridges, dated 3/17/03, MDOT – Edited for Building Projects)

DATE: _____

PROJECT: **BWO-7078-57(002) 501415**

COUNTY: **Pike**

LOCATION: **I-55 NORTHBOUND, PIKE COUNTY, MISSISSIPPI**

A permit is issued to_____
(Company Name & Address)
for transporting loads exceeding the posted limit for any such bridge located on State designated routes within the project termini provided that such transport vehicles comply with all other governing statutory load limits.

This permit is valid on all State designated routes from the point of origin to the point of delivery for materials and equipment utilized in construction of said project and also valid for sub-contractors and vendors upon written permission of the Contractor. The permit is non-transferable and no other haul permit for posted bridges will be issued to other individuals, vendors, or companies for construction of this project.

A copy of this signed permit shall be carried in all vehicles operating under the authority of this permit and also a copy of the Contractor's written permission when the vehicle is other than Contractor owned.

In accordance with State law, the above named Contractor will be liable for damages directly attributable to vehicles operating under this permit.

_____ LARRY L."BUTCH" BROWN
EXECUTIVE DIRECTOR

GENERAL CONDITIONS
DOCUMENT 00700

Part 1 GENERAL

1.01 DESCRIPTION.

A. The American Institute of Architects **AIA DOCUMENT A201-1997**, "General Conditions of the Contract for Construction", 1997, Fifteenth Edition, Articles 1 through 14 inclusive, except as may be added to or modified herein, is hereby made a part of the Contract Documents. For brevity, **AIA DOCUMENT A201-1997** 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.

C. See Document 00800-*Supplementary Conditions.* In the event of a conflict between the **AIA DOCUMENT A201-1997,** "General Conditions of the Contract for Construction", 1997, Fifteenth Edition and Document 00800-*Supplementary Conditions,* Document 00800 shall control even if the conflicting provision in the **AIA DOCUMENT A201-1997** "General Conditions of the Contract for Construction" is not expressly deleted or revised by reference in Document 00800.

1997 Edition - Electronic Format

AIA Document A201 - 1997

General Conditions of the Contract for Construction

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THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES. CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS COMPLETION OR MODIFICATION. AUTHENTICATION OF THIS ELECTRONICALLY DRAFTED AIA DOCUMENT MAY BE MADE BY USING AIA DOCUMENT D401.

This document has been approved and endorsed by The Associated General Contractors of America.

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AIA DOCUMENT A201 - 1997
GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

The American Institute of Architects
1735 New York Avenue, N.W.
Washington, D.C. 20006-5292

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ARTICLE 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

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

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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 Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner and Architect or (4) between any persons or entities other than the Owner and 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 or 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

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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 THE PROJECT MANUAL

The Project Manual is a volume assembled for the Work which may include the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.2 CORRELATION AND INTENT OF THE CONTRACT DOCUMENTS

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

1.2.2 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 which have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

1.3 CAPITALIZATION

1.3.1 Terms capitalized in these General Conditions include those which are (1) specifically defined, (2) the titles of numbered articles and identified references to Paragraphs, Subparagraphs and Clauses in the document or (3) the titles of other documents published by the American Institute of Architects.

1.4 INTERPRETATION

1.4.1 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 EXECUTION OF CONTRACT DOCUMENTS

1.5.1 The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents upon request.

1.5.2 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.

1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATIONS AND OTHER INSTRUMENTS OF SERVICE

1.6.1 The Drawings, Specifications and other documents, including those in electronic form, prepared by the Architect and the Architect's consultants are Instruments of Service through which the Work to be executed by the Contractor is described. The Contractor may retain one record set. Neither the Contractor nor any Subcontractor, Sub-subcontractor or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the Architect or the Architect's consultants, and unless otherwise indicated the Architect and the Architect's consultants shall be deemed the authors of

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them and will retain all common law, statutory and other reserved rights, in addition to the copyrights. All copies of Instruments of Service, except the Contractor's record set, shall be returned or suitably accounted for to the Architect, on request, upon completion of the Work. The Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants, and copies thereof furnished to the Contractor, are for use solely with respect to this Project. They are not to be used by the Contractor or any Subcontractor, Sub-subcontractor or material or equipment supplier 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. The Contractor, Subcontractors, Sub-subcontractors and material or equipment suppliers are authorized to use and reproduce applicable portions of the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants appropriate to and for use in the execution of their Work under the Contract Documents. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the Drawings, Specifications and other documents prepared by the Architect and the Architect's consultants. 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' copyrights or other reserved rights.

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ARTICLE 2 OWNER

2.1 GENERAL

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

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

2.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

2.2.1 The Owner shall, at the written request of the Contractor, prior to commencement of the Work and thereafter, furnish to the Contractor reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Furnishing of such evidence shall be a condition precedent to commencement or continuation of the Work. After such evidence has been furnished, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

2.2.2 Except for permits and fees, including those required under Subparagraph 3.7.1, which are the responsibility of the Contractor under the Contract Documents, 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 Information or services required of the Owner by the Contract Documents shall be furnished by the Owner with reasonable promptness. Any other information or services relevant to the Contractor's performance of the Work under the Owner's control shall be

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furnished by the Owner after receipt from the Contractor of a written request for such information or services.

2.2.5 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, such copies of Drawings and Project Manuals as are reasonably necessary for execution of the Work.

2.3 OWNER'S RIGHT TO STOP THE WORK

2.3.1 If the Contractor fails to correct Work which is not in accordance with the requirements of the Contract Documents as required by Paragraph 12.2 or persistently 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 Subparagraph 6.1.3.

2.4 OWNER'S RIGHT TO CARRY OUT THE WORK

2.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a seven-day period after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may after such seven-day period give the Contractor a second written notice to correct such deficiencies within a three-day period. If the Contractor within such three-day period after receipt of such second notice fails to commence and continue to correct any deficiencies, 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.

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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 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 other than the Contractor.

3.2 REVIEW OF CONTRACT DOCUMENTS AND FIELD CONDITIONS BY CONTRACTOR

3.2.1 Since the Contract Documents are complementary, before starting each portion of the Work, the Contractor shall carefully study and compare the various Drawings and other Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Subparagraph 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 construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, any errors, inconsistencies or omissions discovered by the Contractor

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shall be reported promptly to the Architect as a request for information in such form as the Architect may require.

3.2.2 Any design errors or omissions noted by the Contractor during this review shall be reported promptly to the Architect, but 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. The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations, but any nonconformity discovered by or made known to the Contractor shall be reported promptly to the Architect.

3.2.3 If the Contractor believes that additional cost or time is involved because of clarifications or instructions issued by the Architect in response to the Contractor's notices or requests for information pursuant to Subparagraphs 3.2.1 and 3.2.2, the Contractor shall make Claims as provided in Subparagraphs 4.3.6 and 4.3.7. If the Contractor fails to perform the obligations of Subparagraphs 3.2.1 and 3.2.2, the Contractor shall pay such costs and damages to the Owner as would have been avoided if the Contractor had performed such obligations. The Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents or for differences between field measurements or conditions and the Contract Documents unless the Contractor recognized such error, inconsistency, omission or difference and knowingly failed to report it to the Architect.

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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 shall be solely 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.

3.4.2 The Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order.

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

3.5 WARRANTY

3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, modifications 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

3.6.1 The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor which 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 AND NOTICES

3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses and inspections necessary for proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required when bids are received or negotiations concluded.

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

3.7.3 It is not the Contractor's responsibility to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, building codes, and rules and regulations. However, if the Contractor observes that portions of the Contract Documents are at variance therewith, the Contractor shall promptly notify the Architect and Owner in writing, and necessary changes shall be accomplished by appropriate Modification.

3.7.4 If the Contractor performs Work knowing it to be contrary to laws, statutes, ordinances, building codes, and rules and regulations without such notice to the Architect and Owner, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

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;

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.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;

.3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Clause 3.8.2.1 and (2) changes in Contractor's costs under Clause 3.8.2.2.

3.8.3 Materials and equipment under an allowance shall be selected by the Owner in sufficient time to avoid delay in the Work.

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. Important communications shall be confirmed in writing. Other communications shall be similarly confirmed on written request in each case.

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 and keep current, for the Architect's approval, a schedule of submittals which is coordinated with the Contractor's construction schedule and allows the Architect reasonable time to review 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

3.11.1 The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during construction, and one record 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.

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 which illustrate materials, equipment or workmanship and establish standards by which the Work will be judged.

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3.12.4 Shop Drawings, Product Data, Samples and similar submittals are not Contract Documents. The purpose of their submittal is to demonstrate for those portions of the Work for which submittals are required by the Contract Documents the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents. Review by the Architect is subject to the limitations of Subparagraph 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 which 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 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. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Architect without action.

3.12.6 By approving and submitting Shop Drawings, Product Data, Samples and similar submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has 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 which 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

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services, certifications or approvals performed 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 Subparagraph 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 or design criteria required by the Contract Documents.

3.13 USE OF SITE

3.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

3.14 CUTTING AND PATCHING

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

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.

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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 from and about the Project waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials.

3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the cost thereof shall be charged to the Contractor.

3.16 ACCESS TO WORK

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

3.17 ROYALTIES, PATENTS AND COPYRIGHTS

3.17.1 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 and to the extent claims, damages, losses or expenses are not covered by Project Management Protective Liability insurance purchased by the Contractor in accordance with Paragraph 11.3, 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

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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 which would otherwise exist as to a party or person described in this Paragraph 3.18.

3.18.2 In claims against any person or entity indemnified under this Paragraph 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 Subparagraph 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.

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ARTICLE 4 ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.1 The Architect is the person lawfully licensed to practice architecture or an entity lawfully practicing architecture identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The term "Architect" means the Architect or the Architect's authorized representative.

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 new Architect against whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the former Architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents, and will be an Owner's representative (1) during construction, (2) until final payment is due and (3) with the Owner's concurrence, from time to time during the one-year period for correction of Work described in Paragraph 12.2. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified in writing in accordance with other provisions of the Contract.

4.2.2 The Architect, as a representative of the Owner, will visit the site at intervals appropriate to the stage of the Contractor's operations (1) to become generally familiar with and to keep the Owner informed about the progress and quality of the portion of the Work completed, (2) to endeavor to guard the Owner against defects and deficiencies in the Work, and (3) to determine in general if the Work 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 neither have control over or charge of, nor be responsible 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 Subparagraph 3.3.1.

4.2.3 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,

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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 Owner and Contractor shall endeavor to communicate with each other through the Architect about matters arising out of or relating to the Contract. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and material suppliers shall be through the Contractor. Communications by and with separate contractors shall be through the Owner.

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

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

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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 with such reasonable promptness as to cause no delay in the Work or in the activities of the Owner, Contractor or separate contractors, 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 Paragraphs 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 Architect will prepare Change Orders and Construction Change Directives, and may authorize minor changes in the Work as provided in Paragraph 7.4.

4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion, will receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of the Contract Documents.

4.2.10 If the Owner and Architect agree, the Architect will provide one or more project representatives to assist in carrying out the Architect's responsibilities at the site. The 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 decide matters concerning performance under and requirements of, the Contract Documents on written request of either the Owner or

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Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If no agreement is made concerning the time within which interpretations required of the Architect shall be furnished in compliance with this Paragraph 4.2, then delay shall not be recognized on account of failure by the Architect to furnish such interpretations until 15 days after written request is made for them.

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 initial 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 so 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.

4.3 CLAIMS AND DISPUTES

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

4.3.2 Time Limits on Claims. 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. Claims must be initiated by written notice to the Architect and the other party.

4.3.3 Continuing Contract Performance. Pending final resolution of a Claim except as otherwise agreed in writing or as provided in Subparagraph 9.7.1 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.

4.3.4 Claims for Concealed or Unknown Conditions. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which 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, then notice by the observing party shall be given to the other party promptly 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 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 so notify the Owner and Contractor in writing, stating the reasons. Claims by either party in opposition to such determination must be made within 21 days after the Architect has given notice of the decision. If the conditions encountered are materially different, the Contract Sum and Contract Time shall be equitably adjusted, but if the Owner and Contractor cannot agree on an adjustment in the Contract Sum or Contract Time, the adjustment shall be referred to the Architect for initial determination, subject to further proceedings pursuant to Paragraph 4.4.

4.3.5 Claims for Additional Cost. If the Contractor wishes to make Claim for an increase in the Contract Sum, written notice as provided herein shall be given before

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proceeding to execute the Work. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Paragraph 10.6.

4.3.6 If the Contractor believes additional cost is involved for reasons including but not limited to (1) a written interpretation from the Architect, (2) an order by the Owner to stop the Work where the Contractor was not at fault, (3) a written order for a minor change in the Work issued by the Architect, (4) failure of payment by the Owner, (5) termination of the Contract by the Owner, (6) Owner's suspension or (7) other reasonable grounds, Claim shall be filed in accordance with this Paragraph 4.3.

4.3.7 Claims for Additional Time

4.3.7.1 If the Contractor wishes to make 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.

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

4.3.8 Injury or Damage to Person or Property. If either party to the Contract 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.

4.3.9 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.

4.3.10 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 Subparagraph 4.3.10 shall be deemed to preclude an award of liquidated direct damages, when applicable, in accordance with the requirements of the Contract Documents.

4.4 RESOLUTION OF CLAIMS AND DISPUTES

4.4.1 Decision of Architect. Claims, including those alleging an error or omission by the Architect but excluding those arising under Paragraphs 10.3 through 10.5, shall be referred initially to the Architect for decision. An initial decision by the Architect shall be required as a condition precedent to mediation, arbitration or litigation of all Claims between the Contractor

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and Owner arising prior to the date final payment is due, unless 30 days have passed after the Claim has been referred to the Architect with no decision having been rendered by the Architect. The Architect will not decide disputes between the Contractor and persons or entities other than the Owner.

4.4.2 The Architect will review Claims and within ten days of the receipt of the 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 Architect is unable to resolve the Claim if the Architect lacks sufficient information to evaluate the merits of the Claim or if the Architect concludes that, in the Architect's sole discretion, it would be inappropriate for the Architect to resolve the Claim.

4.4.3 In evaluating Claims, the Architect 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 Architect in rendering a decision. The Architect may request the Owner to authorize retention of such persons at the Owner's expense.

4.4.4 If the Architect 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 provide a response on the requested supporting data, advise the Architect when the response or supporting data will be furnished or advise the Architect that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Architect will either reject or approve the Claim in whole or in part.

4.4.5 The Architect will approve or reject Claims by written decision, which shall state the reasons therefor and which shall notify the parties of any change in the Contract Sum or Contract Time or both. The approval or rejection of a Claim by the Architect shall be final and binding on the parties but subject to mediation and arbitration.

4.4.6 When a written decision of the Architect states that (1) the decision is final but subject to mediation and arbitration and (2) a demand for arbitration of a Claim covered by such decision must be made within 30 days after the date on which the party making the demand receives the final written decision, then failure to demand arbitration within said 30 days' period shall result in the Architect's decision becoming final and binding upon the Owner and Contractor. If the Architect renders a decision after arbitration proceedings have been initiated, such decision may be entered as evidence, but shall not supersede arbitration proceedings unless the decision is acceptable to all parties concerned.

4.4.7 Upon receipt of a Claim against the Contractor or at any time thereafter, the Architect or 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 Architect or the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

4.4.8 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 prior to resolution of the Claim by the Architect, by mediation or by arbitration.

4.5 MEDIATION

4.5.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 4.3.10, 9.10.4 and 9.10.5 shall, after initial decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to mediation as a condition precedent to arbitration or the institution of legal or equitable proceedings by either party.

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4.5.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association currently in effect. Request for mediation shall be filed in writing with the other party to the Contract and with the American Arbitration Association. The request may be made concurrently with the filing of a demand for arbitration but, in such event, mediation shall proceed in advance of arbitration or legal or equitable proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order.

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

4.6 ARBITRATION

4.6.1 Any Claim arising out of or related to the Contract, except Claims relating to aesthetic effect and except those waived as provided for in Subparagraphs 4.3.10, 9.10.4 and 9.10.5, shall, after decision by the Architect or 30 days after submission of the Claim to the Architect, be subject to arbitration. Prior to arbitration, the parties shall endeavor to resolve disputes by mediation in accordance with the provisions of Paragraph 4.5.

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4.6.2 Claims not resolved by mediation shall be decided by arbitration which, unless the parties mutually agree otherwise, shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association currently in effect. The demand for arbitration shall be filed in writing with the other party to the Contract and with the American Arbitration Association, and a copy shall be filed with the Architect.

4.6.3 A demand for arbitration shall be made within the time limits specified in Subparagraphs 4.4.6 and 4.6.1 as applicable, and in other cases within a reasonable time after the Claim has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such Claim would be barred by the applicable statute of limitations as determined pursuant to Paragraph 13.7.

4.6.4 Limitation on Consolidation or Joinder. No arbitration arising out of or relating to the Contract shall include, by consolidation or joinder or in any other manner, the Architect, the Architect's employees or consultants, except by written consent containing specific reference to the Agreement and signed by the Architect, Owner, Contractor and any other person or entity sought to be joined. No arbitration shall include, by consolidation or joinder or in any other manner, parties other than the Owner, Contractor, a separate contractor as described in Article 6 and other persons substantially involved in a common question of fact or law whose presence is required if complete relief is to be accorded in arbitration. No person or entity other than the Owner, Contractor or a separate contractor as described in Article 6 shall be included as an original third party or additional third party to an arbitration whose interest or responsibility is insubstantial. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of a Claim not described therein or with a person or entity not named or described therein. The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

4.6.5 Claims and Timely Assertion of Claims. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

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

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 will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Architect to reply promptly 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 change a Subcontractor, person or entity previously selected if the Owner or Architect makes reasonable objection to such substitute.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 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

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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 which 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 Paragraph 14.2 and only for those subcontract agreements which 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.

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.

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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 in connection with other portions of the Project or other construction or operations on the site under Conditions of the Contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. If the Contractor claims that delay or additional cost is involved because of such action by the Owner, the Contractor shall make such Claim as provided in Paragraph 4.3.

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

6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. 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 Other until subsequently revised.

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

6.2 MUTUAL RESPONSIBILITY

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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 Owner shall be reimbursed by the Contractor for costs incurred by the Owner which are payable to a separate contractor because of delays, improperly timed activities or defective construction of the Contractor. The Owner shall be responsible to the Contractor for costs incurred by the Contractor because of delays, improperly timed activities, damage to the Work or defective construction of a separate contractor.

6.2.4 The Contractor shall promptly remedy damage wrongfully caused by the Contractor to completed or partially completed construction or to property of the Owner or separate contractors as provided in Subparagraph 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 Subparagraph 3.14.

6.3 OWNER'S RIGHT TO CLEAN UP

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

ARTICLE 7 CHANGES IN THE WORK

7.1 GENERAL

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

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

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

7.2 CHANGE ORDERS

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

.1 change in the Work;
.2 the amount of the adjustment, if any, in the Contract Sum; and

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.3 the extent of the adjustment, if any, in the Contract Time.

7.2.2 Methods used in determining adjustments to the Contract Sum may include those listed in Subparagraph 7.3.3.

7.3 CONSTRUCTION CHANGE DIRECTIVES

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

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

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

- .1 mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 as provided in Subparagraph 7.3.6.

7.3.4 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.

7.3.5 A Construction Change Directive signed by the Contractor indicates the agreement of the Contractor 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.

7.3.6 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the method and the adjustment shall be determined by the Architect 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, a reasonable allowance for overhead and profit. In such case, and also under Clause 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 Subparagraph 7.3.6 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.

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7.3.7 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change which 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.

7.3.8 Pending final determination of the total cost of a Construction Change Directive to the Owner, amounts not in dispute for such changes in the Work shall be included in Applications for Payment accompanied by a Change Order indicating the parties' agreement with part or all of such costs. For any portion of such cost that remains in dispute, the Architect will make an interim determination for purposes of monthly certification for payment for those costs. That 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 4.

7.3.9 When the Owner and Contractor agree with the 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 shall be recorded by preparation and execution of an appropriate Change Order.

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7.4 MINOR CHANGES IN THE WORK

7.4.1 The Architect will have 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 shall be effected by written order and shall be binding on the Owner and Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE 8 TIME

8.1 DEFINITIONS

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

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

8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Paragraph 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. Unless the date of commencement is established by the Contract Documents or a notice to proceed given by the Owner, the Contractor shall notify the Owner in writing not less than five days or other agreed period before commencing the Work to permit the timely filing of mortgages, mechanic's liens and other security interests.

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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 an act or neglect of the Owner or Architect, or of an employee of either, or of a separate contractor employed by the Owner, or by changes ordered in the Work, or by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the Contractor's control, or by delay authorized by the Owner pending mediation and arbitration, or by other causes which the Architect determines may justify delay, then the Contract Time shall be extended by Change Order for such reasonable time as the Architect may determine.

8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Paragraph 4.3.

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

ARTICLE 9 PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

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

9.2 SCHEDULE OF VALUES

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, 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, 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 for operations completed in accordance with the schedule of values. 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 reflecting retainage if provided for in the Contract Documents.

9.3.1.1 As provided in Subparagraph 7.3.8, such applications may include requests for payment on account of changes in the Work which 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 Such applications may not include requests for payment for portions of the Work for which the Contractor does not intend to pay to a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

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

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shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, 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 issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part as provided in Subparagraph 9.5.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information and belief, 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 Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and 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 withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Subparagraph 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Subparagraph 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Subparagraph 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;

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.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

.5 damage to the Owner or another 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 persistent failure to carry out the Work in accordance with the Contract Documents.

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

9.6 PROGRESS PAYMENTS

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

9.6.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's portion of the Work, the amount to which said Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of such 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 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 Payment to material suppliers shall be treated in a manner similar to that provided in Subparagraphs 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.

9.7 FAILURE OF PAYMENT

9.7.1 If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents the amount certified by the Architect or awarded by arbitration, then the Contractor may, upon seven additional days' written notice to the Owner and Architect, stop

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the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shut-down, delay and start-up, plus interest as provided for in the Contract Documents.

9.8 SUBSTANTIAL COMPLETION

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

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

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

9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion which 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 Clause 11.4.1.5 and authorized by public authorities having jurisdiction over the Work. 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 Subparagraph 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.

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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 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 Subparagraph 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

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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 Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed 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 certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

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

.1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;

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.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.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 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.

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10.2.2 The Contractor shall give notices and comply with applicable laws, ordinances, rules, 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 Clauses 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 Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Paragraph 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.

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10.2.7 The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

10.3 HAZARDOUS MATERIALS

10.3.1 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.

10.3.2 The Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to verify that it has been rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of such material or substance or who are to perform the task of removal or safe containment of such material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. The Contract Time shall be extended appropriately and the Contract Sum shall be increased in the amount of the Contractor's reasonable additional costs of shut-down, delay and start-up, which adjustments shall be accomplished as provided in Article 7.

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

10.4 The Owner shall not be responsible under Paragraph 10.3 for materials and substances brought to the site by the Contractor unless such materials or substances were required by the Contract Documents.

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

10.6 EMERGENCIES

10.6.1 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 Paragraph 4.3 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

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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 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 which 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 Paragraph 3.18.

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11.1.2 The insurance required by Subparagraph 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 date of commencement of the Work until date of final payment and termination of any coverage required to be maintained after final payment.

11.1.3 Certificates of insurance acceptable to the Owner shall be filed with the Owner prior to commencement of the Work. These certificates and the insurance policies required by this Paragraph 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. If any of the foregoing insurance coverages are required to remain in force after final payment and are reasonably available, an additional certificate evidencing continuation of such coverage shall be submitted with the final Application for Payment as required by Subparagraph 9.10.2. 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 in accordance with the Contractor's information and belief.

11.2 OWNER'S LIABILITY INSURANCE

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

11.3 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE

11.3.1 Optionally, the Owner may require the Contractor to purchase and maintain Project Management Protective Liability insurance from the Contractor's usual sources as primary coverage for the Owner's, Contractor's and Architect's vicarious liability for construction operations under the Contract. Unless otherwise required by the Contract Documents, the Owner shall reimburse the Contractor by increasing the Contract Sum to pay the cost of purchasing and maintaining such optional insurance coverage, and the Contractor shall not be responsible for purchasing any other liability insurance on behalf of the Owner. The minimum limits of liability purchased with such coverage shall be equal to the aggregate of the limits required for Contractor's Liability Insurance under Clauses 11.1.1.2 through 11.1.1.5.

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11.3.2 To the extent damages are covered by Project Management Protective Liability insurance, the Owner, Contractor and Architect waive all rights against each other for damages, except such rights as they may have to the proceeds of such insurance. The policy shall provide for such waivers of subrogation by endorsement or otherwise.

11.3.3 The Owner shall not require the Contractor to include the Owner, Architect or other persons or entities as additional insureds on the Contractor's Liability Insurance coverage under Paragraph 11.1.

11.4 PROPERTY INSURANCE

11.4.1 Unless otherwise provided, the Owner 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 Paragraph 9.10 or until no person or entity other than the Owner has an insurable interest in the property required by this Paragraph 11.4 to be covered, whichever is later. This insurance shall include interests of the Owner, the Contractor, Subcontractors and Sub-subcontractors in the Project.

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11.4.1.1 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.

11.4.1.2 If the Owner does not intend to purchase such property insurance required by the Contract and with all of the coverages in the amount described above, the Owner shall so inform the Contractor in writing prior to commencement of the Work. The Contractor may then effect insurance which will protect the interests of the Contractor, Subcontractors and Sub-subcontractors in the Work, and by appropriate Change Order the cost thereof shall be charged to the Owner. If the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain insurance as described above, without so notifying the Contractor in writing, then the Owner shall bear all reasonable costs properly attributable thereto.

11.4.1.3 If the property insurance requires deductibles, the Owner shall pay costs not covered because of such deductibles.

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

11.4.1.5 Partial occupancy or use in accordance with Paragraph 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.

11.4.2 Boiler and Machinery Insurance. The Owner shall purchase and maintain boiler and machinery insurance required by the Contract Documents or by law, which shall specifically cover such insured objects during installation and until final acceptance by the

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Owner; this insurance shall include interests of the Owner, Contractor, Subcontractors and Sub-subcontractors in the Work, and the Owner and Contractor shall be named insureds.

11.4.3 Loss of Use Insurance. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

11.4.4 If the Contractor requests in writing that insurance for risks other than those described herein or other special causes of loss be included in the property insurance policy, the Owner shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order.

11.4.5 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, the Owner shall waive all rights in accordance with the terms of Subparagraph 11.4.7 for damages caused by fire or other causes of loss covered by this separate property insurance. All separate policies shall provide this waiver of subrogation by endorsement or otherwise.

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11.4.6 Before an exposure to loss may occur, the Owner shall file with the Contractor a copy of each policy that includes insurance coverages required by this Paragraph 11.4. Each policy shall contain all generally applicable conditions, definitions, exclusions and endorsements related to this Project. Each policy shall contain a provision that the policy will not be canceled or allowed to expire, and that its limits will not be reduced, until at least 30 days' prior written notice has been given to the Contractor.

11.4.7 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 Paragraph 11.4 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.

11.4.8 A loss insured under 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 Subparagraph 11.4.10. 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.

11.4.9 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

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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 in accordance with an arbitration award in which case the procedure shall be as provided in Paragraph 4.6. 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.

11.4.10 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 days after occurrence of loss to the Owner's exercise of this power; if such objection is made, the dispute shall be resolved as provided in Paragraphs 4.5 and 4.6. The Owner as fiduciary shall, in the case of arbitration, make settlement with insurers in accordance with directions of the arbitrators. If distribution of insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

11.5 PERFORMANCE BOND AND PAYMENT BOND

11.5.1 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.

11.5.2 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 permit a copy to be made.

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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 required 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 which 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, 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 SUBSTANTIAL COMPLETION

12.2.1.1 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 and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

12.2.2 AFTER SUBSTANTIAL COMPLETION

12.2.2.1 In addition to the Contractor's obligations under Paragraph 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Subparagraph 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

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GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

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correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Paragraph 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 Substantial Completion by the period of time between Substantial Completion and the actual performance 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 Paragraph 12.2.

12.2.3 The Contractor shall remove from the site portions of the Work which 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 which is not in accordance with the requirements of the Contract Documents.

12.2.5 Nothing contained in this Paragraph 12.2 shall be construed to establish a period of limitation with respect to other obligations which the Contractor might have under the Contract Documents. Establishment of the one-year period for correction of Work as described in Subparagraph 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

12.3.1 If the Owner prefers to accept Work which 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

13.1.1 The Contract shall be governed by the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns and legal representatives to the other party hereto and to partners, successors, assigns and legal representatives of such other party in respect to covenants, agreements and obligations contained in the Contract Documents. Except as provided in Subparagraph 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 an institutional lender providing construction financing for the Project. In such event, the lender

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shall assume 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

13.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or 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 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 thereunder, except as may be specifically agreed in writing.

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13.5 TESTS AND INSPECTIONS

13.5.1 Tests, inspections and approvals of portions of the Work required by the Contract Documents or by laws, ordinances, rules, regulations or orders of public authorities having jurisdiction shall be made at an appropriate time. 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 tests, inspections or approvals which do not become requirements until after bids are received or negotiations concluded.

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 Subparagraph 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 Subparagraph 13.5.3, shall be at the Owner's expense.

13.5.3 If such procedures for testing, inspection or approval under Subparagraphs 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.

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13.6 INTEREST

13.6.1 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 COMMENCEMENT OF STATUTORY LIMITATION PERIOD

13.7.1 As between the Owner and Contractor:

.1 **Before Substantial Completion.** As to acts or failures to act occurring prior to the relevant date of Substantial Completion, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than such date of Substantial Completion;

.2 **Between Substantial Completion and Final Certificate for Payment.** As to acts or failures to act occurring subsequent to the relevant date of Substantial Completion and prior to issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of issuance of the final Certificate for Payment; and

.3 **After Final Certificate for Payment.** As to acts or failures to act occurring after the relevant date of issuance of the final Certificate for Payment, any applicable statute of limitations shall commence to run and any alleged cause of action shall be deemed to have accrued in any and all events not later than the date of any act or failure to act by the Contractor pursuant to any Warranty provided under Paragraph 3.5, the date of any correction of the Work or failure to correct the Work by the Contractor under Paragraph 12.2, or the date of actual commission of any other act or failure to perform any duty or obligation by the Contractor or Owner, whichever occurs last.

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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 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 which requires all Work to be stopped;

.2 an act of government, such as a declaration of national emergency which 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 Subparagraph 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 Subparagraph 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 Paragraph 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.

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14.1.3 If one of the reasons described in Subparagraph 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 and for proven loss with respect to materials, equipment, tools, and construction equipment and machinery, including reasonable overhead, profit 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 persistently 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 Subparagraph 14.1.3.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 The Owner may terminate the Contract if the Contractor:

- **.1** persistently or 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** persistently disregards laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction; 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 Architect 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** take possession of the site and of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- **.2** accept assignment of subcontracts pursuant to Paragraph 5.4; and
- **.3** finish the Work by whatever reasonable method the Owner may deem expedient. Upon 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 Subparagraph 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 Architect, 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.

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

.1 that performance is, was or would have been so suspended, delayed or interrupted by another cause for which the Contractor is responsible; or

.2 that an equitable adjustment is made or denied under another provision of the Contract.

14.4 TERMINATION BY THE OWNER FOR CONVENIENCE

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

14.4.2 Upon receipt of 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.

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SUPPLEMENTARY CONDITIONS
Document 00800

Part 1 GENERAL

1.01 DESCRIPTION

A. **Owner:** These supplements are necessary because the Owner is an agency, or political subdivision, of the State of Mississippi and occupies a different position from that of the usual Owner.

B. **Document:** The following supplements modify, change, delete from, or add to the **AIA DOCUMENT A201-1997**, "General Conditions of the Contract for Construction", 1997, Fifteenth Edition. When any Article of the General Conditions is modified, or deleted, by these Supplementary Conditions, the unaltered provisions of that Article, Paragraph, Subparagraph, or Clause will remain in effect. The "General Conditions of the Contract for Construction" may also be supplemented or amplified elsewhere in the Contract Documents by provisions located in, but not necessarily limited to, Division 1 of the Specifications.

1.02 Verification Of Dimensions: Before ordering any materials or doing any work, the Contractor shall verify the dimensions and shall be responsible for the accuracy of such dimensions as they affect the Work. No extra compensation will be allowed on account of differences between the dimensions shown on the Drawings and actual dimensions.

1.03 Plans And Specifications: The Specifications and the Drawings are intended to be in agreement with each other, and to be mutually explanatory. They are also intended to be complementary and any Work or material called for by either shall be provided as if called for by both.

1.04 Execution Of The Work: Sections of Division 1 General Requirements govern the execution of the Work of all Sections 2-16 of the Specifications.

1.05 Workmanship: 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 / MDOT Architect, 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 / MDOT Architect, dangerous, disorderly, insubordinate, incompetent, or otherwise objectionable.

1.06 Use Of Site And Facilities: 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.

1.07 Utilities: The Owner will furnish utilities for construction (electricity and water). Contractor must use "as- is" or pay for any necessary modifications.

1.08 Inspection Of Work: 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 preformed on Legal Holidays, Sundays or after 5:00 P.M. on week days without prior written approval from the Project Engineer.

Article 1 GENERAL PROVISIONS

1.1 BASIC DEFINITIONS

1.1.1 **The Contract Documents**: Delete the last sentence of this Subparagraph and substitute following sentence:

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.

1.6 OWNERSHIP AND USE OF DRAWINGS, SPECIFICATION AND OTHER INSTRUMENTS OF SERVICE

1.6.1 Add a new sentence at the end of this Subparagraph:

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.

Article 2 OWNER

2.1 GENERAL

2.1.1 Change this Subparagraph to read as follows:

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. Except as otherwise provided in Subparagraph 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

2.2.5 Change this Subparagraph to read as follows:

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).

Article 3 CONTRACTOR

3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

3.3.1 Change the last sentence to read as follows:

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.

3.18 INDEMNIFICATION

3.18.3 Add a new Subparagraph as follows:

The Contractor agrees to defend, hold harmless and indemnify the Owner against all claims or demands caused by the Contractor's acts or omissions.

Article 4 ADMINISTRATION OF THE CONTRACT

4.1 ARCHITECT

4.1.4 Add a new Subparagraph as follows:

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 and inspect construction of this Project.

4.1.5 Add a new Subparagraph as follows:

The term "Project Engineer" as used in these Documents refers to the Mississippi Department of Transportation Executive Director's authorized representative. The term "MDOT Architect" is Director of Architectural Services and is an advisor to the Project Engineer.

4.5 MEDIATION

4.5.1 Delete this Subparagraph in its entirety.

4.5.2 Delete this Subparagraph in its entirety.

4.5.3 Delete this Subparagraph in its entirety.

4.6 ARBITRATION

4.6.1 Delete this Subparagraph in its entirety.

4.6.2 Delete this Subparagraph in its entirety.

4.6.3 Delete this Subparagraph in its entirety.

4.6.4 Delete this Subparagraph in its entirety.

4.6.5 Delete this Subparagraph in its entirety.

4.6.6 Delete this Subparagraph in its entirety

4.7 Add a new Paragraph as follows:

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).

4.7.1 Add a new Subparagraph as follows:

CONDITIONS PRECEDENT TO ARBITRATION

.1 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.

.2 If the dispute cannot be satisfactorily resolved, within thirty (30) days of the complaint being rejected in writing by either party, notice by certified mail shall be given to the Project Engineer. A copy of the notice shall be sent by certified mail to the opposing party. Such notice shall be in writing setting forth in detail the matter(s) in dispute, the amount involved, the remedy sought and state that informal resolution between the parties cannot be reached. Such writing shall include copies of any documents, writings, plans, or other matter pertinent to the resolution of the dispute. Opposing party shall have the opportunity to set forth in writing a rebuttal with pertinent documents attached. At the sole discretion of the Project Engineer, oral testimony may be had on the matter.

4.7.2 Add a new Subparagraph as follows:

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.

4.7.3 Add a new Subparagraph as follows:

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.

4.7.4 Add a new Subparagraph as follows:

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.

4.7.5 Add a new Subparagraph as follows:

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.

4.7.6 Add a new Subparagraph as follows:

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.

4.7.7 Add a new Subparagraph as follows:

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.

4.7.8 Add a new Subparagraph as follows:

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.

Article 5 SUBCONTRACTORS

No supplementary conditions.

Article 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

No supplementary conditions.

Article 7 CHANGES IN THE WORK

7.1 GENERAL

7.1.1 Replace the words "Change Order" with the words "Supplemental Agreement".

7.2 CHANGE ORDERS

7.2.3 Add a new Subparagraph as follows:
The maximum cost included in a Change Order (Supplemental Agreement) for profit and overhead is limited to twenty-five percent (25%) 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 acquiesce to the same requirements when participating in a Change Order (Supplemental Agreement).

Article 8 TIME

8.1 DEFINITIONS

8.1.1 Change this Subparagraph to read as follows:

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

8.1.3 Change this Subparagraph to read as follows:

The date of Completion is the date certified by the Project Engineer and approved by the Owner in accordance with Paragraph 9.8 entitled "Substantial Completion."

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 Change this Subparagraph to read as follows:

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 / MDOT Architect, 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 / MDOT Architect determines may justify the delay, then the Contract time may be extended by Change Order for such reasonable time as the Architect may determine, subject to the Owner's approval. 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.

Article 9 PAYMENTS AND COMPLETION

9.3 APPLICATIONS FOR PAYMENT

9.3.1 Add a new sentence to the end of this Subparagraph:

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.

9.3.1.3 Add a new Clause to Subparagraph 9.3.1 as follows:

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 and/or the MDOT Architect'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 ½%) of the amount due the Contractor on account of progress payments.

9.3.1.4 Add a new Clause to Subparagraph 9.3.1 as follows:

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.

9.3.2.1 Add a new Clause to Subparagraph 9.3.2 as follows:

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 Add a new Clause to Subparagraph 9.3.2 as follows:

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.

9.6 PROGRESS PAYMENTS

9.6.8 Add a new Subparagraph as follows:

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

9.7.1 Change this Subparagraph to read as follows:

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

9.8.4 Add a new sentence at the end of this Subparagraph:

Substantial Completion shall not be recognized under this Contract. The Project Engineer, under the advisement of the MDOT Architect, shall determine when the building is complete to the point it can be used for its intended purpose and occupied.

9.11 LIQUIDATED DAMAGES

9.11.1 Add a new Paragraph as follows:

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 Day
$ 0	$ 100,000	$ 140
100,000	500,000	200
500,000	1,000,000	300
1,000,000	2,000,000	400
2,000,000	5,000,000	650
5,000,000	10,000,000	750
10,000,000	--------	1,400

Article 10 PROTECTION OF PERSONS AND PROPERTY

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.5 Change this Subparagraph to read as follows:

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 Clause 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 for Clauses 10.2.1.2 and 10.2.1.3, except damage or loss attributable to acts or omissions of the Owner or Project Engineer / MDOT Architect 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 Paragraph 3.18.

10.3 HAZARDOUS MATERIALS

10.3.2 Delete this Subparagraph in its entirety.

10.3.3 Delete this Subparagraph in its entirety.

10.4 Delete this Subparagraph in its entirety.

10.5 Delete this Subparagraph in its entirety.

Article 11 INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.4 Add a new Subparagraph as follows:

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 Occurrence
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

11.1.5 Add a new Subparagraph as follows:

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.

11.1.6 Add a new Subparagraph as follows:

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

11.2.1 Delete this Subparagraph in its entirety and substitute the following:

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 PROJECT MANAGEMENT PROTECTIVE LIABILITY INSURANCE

Delete this Paragraph in its entirety.

11.4 PROPERTY INSURANCE (BUILDER'S RISK OR INSTALLATION FLOATER)

11.4.1 Change the first line in this Subparagraph to read as follows:

The Contractor shall purchase…

11.4.1.2 Delete this Clause under Subparagraph 11.4.1 in its entirety.

11.4.1.3 Change the following Clause in Subparagraph 11.3.1 to read as follows:

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

11.4.2 Delete this Subparagraph in its entirety.

11.4.3 Delete this Subparagraph in its entirety.

11.4.4 Delete this Subparagraph in its entirety.

11.4.5 Delete this Subparagraph in its entirety.

11.4.6 Delete this Subparagraph in its entirety.

11.4.10 Change this Subparagraph to read as follows:

> 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.

Article 12 UNCOVERING AND CORRECTION OF WORK

No supplementary conditions.

Article 13 MISCELLANEOUS PROVISIONS

No supplementary conditions.

Article 14 TERMINATION OR SUSPENSION OF THE CONTRACT

No supplementary conditions.

END OF DOCUMENT

SECTION 01110 SUMMARY OF WORK

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 under one (1) Contract to improve the Mississippi Department of Transportation site in on I-55, Pike County, Mississippi. A Lump Sum as described in these Specifications and Drawings are to be given for the Contract Sum for the following:

1. Description A: Project No. BWO-7078-57(002) 501415, Renovations to Welcome Center on I-55 Northbound, Pike County, Mississippi.

B. General Conditions: AIA 201 General Conditions and Supplemental Conditions.

C. Time of Completion: The completion of this Work is to be on or before the time indicated on the Owner and Contractor Agreement.

D. 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 6 copies to the Project Engineer a Schedule of Values as described in Section 01295 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.

9. Sub-Contractors List: Submit 6 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 01310– 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

1. 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 any 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.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01210 ALLOWANCES

PART 1 GENERAL

1.01 DESCRIPTION

A. Related work specified elsewhere:

1. Sections of specifications as listed under Schedule of Allowances.

B. Allowances for products:

1. Purchase products under each allowance as directed by Project Engineer.

2. Amount of each allowance includes:

a. Net cost of product
b. Delivery and unloading at site
c. Applicable taxes

3. In addition to amounts of allowance, include in bid for inclusion in the Contract Sum, Contractor's cost for:

a. Handling at site, including uncrating and storage
b. Protection from elements; from damage
c. Labor, installation, and finishing
d. Other expenses required to complete installation
e. Overhead and profit.

C. Selection of products:

1. MDOT Architect's duties: Consult with contractor in consideration of products and suppliers; make selection, designate products to be used and notify Contractor in writing.

2. Contractor's duties: Assist MDOT Architect in determining qualified suppliers'; obtain proposals from suppliers when requested by MDOT Architect; and make appropriate recommendations for consideration of MDOT Architect. Upon notification of selection, enter into purchase agreement with designated supplier.

D. Delivery: The Contractor is responsible for arranging all delivery and unloading and should promptly inspect products for damage or defects and submit claims for transportation damage.

E. Installation: Comply with requirements of referenced Specification Section.

F. Adjustment of costs: Should actual purchase cost be more or less than specified amount of allowance, Contract Sum will be adjusted by Change Order equal to amount of difference.

1.02 SCHEDULE OF ALLOWANCES

A. Include in the Contract Sum the amount of $10,000.00 for Contingency Allowance to be used upon Owner's instruction.

1. Unforeseen changes or modifications to the Work that increase the aggregate total Contract Sum up to $10,000.00, including the Contractor's costs for taxes, bonding, insurance, overhead and profit shall be calculated in the Base Bid. These changes shall be shown on the Schedule of Values as an Allowance line item so that Change Orders (Supplemental Agreements) authorizing expenditure of funds from this amount will only include costs of materials and delivery, installation, equipment rental, and direct labor associated with installation.

2. After the total aggregate amount of changes to the Work has exceeded $10,000.00, the Contractor shall be allowed to include taxes, bonding, insurance, costs of materials and delivery, installation, equipment rental, labor, and payroll. Contractor shall also be allowed to include overhead and profit costs as stated in Supplementary Conditions of these Specifications for any additional Work.

3. Funds will be drawn from Contingency Allowance only by Change Order (Supplemental Agreements).

4. At closeout of Contract, funds remaining in Contingency Allowance will be credited to Owner by Change Order (Supplemental Agreements).

B. There are no other Allowances for this Project.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01290 PAYMENT PROCEDURES

PART 1 GENERAL

1.01 METHOD OF MEASUREMENT: The method of measurement and payment shall conform to the applicable provisions of Article 9 of the AIA Document A201-1997 General Conditions of the Contract for Construction.

1.02 APPLICATION 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 as an extension on continuation sheet, listing Change Order number and dollar amount as for an original Item of Work.
5. Prepare Application for Final Payment as specified in Section 01770-Closeout Procedures.

C. Submittal Procedures:

1. Submit 5 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 01320-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.

1.03 BASIS OF PAYMENT

A. This Work will be paid for by Contract Sum for the construction in District Seven. The Work includes Renovation of Welcome Center on I-55 Northbound, Pike County, 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:
MDOT Project No. BWO-7078-57(002) 501415
Renovation of Welcome Center
on I-55 Northbound, Pike County lump sum

TOTAL PROJECT CONTRACT SUM **LUMP SUM**

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01295 SCHEDULE OF VALUES

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope: Submit 6 copies of the Schedule of Values to the Project Engineer at least 10 days prior to submitting first Application for Payment. This Schedule will be reviewed and forwarded to the MDOT Architect. The MDOT Architect will review and forward to his Consultants and to Contract Administration. Upon Project Engineer / MDOT Architect's request, support the values given with data substantiating their correctness. List quantities of materials. 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. 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 2- 16. Identify each line item with number and title as listed in Table of Contents of this Specification.

C. 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, Contingency Allowance, 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. For 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.

D. 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 multiplied by quantities equal material cost of that item in Schedule of Values.

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

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01298 CHANGE ORDER PROCEDURES

PART 1 GENERAL

1.01 SCOPE: This Section describes the procedures for processing Change Orders (Supplemental Agreements) by the Project Engineer and the Contractor.

1.02 CHANGE ORDER 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 it's 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 any requested substitutions in accordance with Section 01630 - Product Options and Substitution Procedures.

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 any 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 01310 PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Scope: To set forth procedures, conditions and responsibility for coordination of the total project.

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 Director with copies to the Construction Engineer, Office 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 the written consent of the Project Engineer.

1.02 DUTIES OF PROJECT COORDINATOR (SUPERINTENDENT)

A. General:
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 dairy to the Project Engineer and the MDOT Architect each Monday for the previous week.
4. Electrical: Take special care to coordinate and supervise the Work of the 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.
7. Permits: Assist in obtaining building and special permits required for construction.

B. Interpretations of Contract Documents
1. Consultation: Consult with Project Engineer / MDOT Architect to obtain interpretations.
2. Assistance: Assist in resolution of any questions.
3. Transmission: 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 One: Coordinate and assist in the preparation of all requirements of Division One and specifically as follows:
1. Enforce all safety requirements.
2. Schedule of Values: 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 and Product Options: 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 for transmittal to the MDOT Architect
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.

1.03 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.

1.04 SUBCONTRACTOR'S DUTIES: The Subcontractor is responsible to coordinate and supervise his employees in the Work accomplished under his part of the Contract.

A. Schedules: Conduct Work to assure compliance with construction schedules.

B. Suppliers: Transmit all instructions to his material suppliers.

C. Cooperation: Cooperate with the Project Coordinator and other subcontractors.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01315 PROJECT MEETINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provisions for and procedures related to the required Project Meetings which include, but not limited to, the following for each Project Phase:
   1. Pre-Construction Meeting.
   2. Periodic Progress Meetings.

1.02 MEETINGS

A. Purpose of Meetings: Project Meetings shall be held for the following reasons:
   1. To establish an understanding of what is expected from everyone involved.
   2. To enable an orderly Project review during the progress of the Work.
   3. To provide for systematic discussion of problems and effect remedies and clarifications.
   4. To coordinate the Work.
   5. To review installation procedures and schedules.

1.03 SCHEDULING AND ADMINISTRATION

A. 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.

B. 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 effected parties of result and include report of activities in next scheduled meeting.

C. 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.

D. Consultants may attend meetings to ascertain work is expedited consistent with Contract Documents and construction schedules.

1.04 PRE-CONSTRUCTION MEETING

A. Schedule: Schedule Pre-Construction Meeting within 10 days after Notice to Proceed.

B. Location: A central site, convenient for all parties, designated by the Contractor and approved by the Project Engineer and the MDOT Architect.

C. Attendance: Attending shall be the Project Engineer and MDOT representatives associated with the Project, the MDOT Architect (if requested by the District), his Consultants, the General Contractor, all major Subcontractors, and any representatives of governmental or other regulatory agencies as required.

D. Minimum Agenda:
1. Distribute and discuss construction schedule prepared by Contractor.
2. Review critical Work sequencing.
3. Designate responsibilities.
4. State procedures for submittals.
5. State procedures for maintaining record documents.
6. State procedures for change orders.
7. State procedures for application of payment.
8. Coordinate use of premises, including office and storage areas.
9. List Owner's requirements.
10. Show clear understanding of Security.
11. Show clear understanding of Housekeeping procedures.

1.05 PROGRESS MEETINGS

A. 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.

B. Place of Project Meetings: Contractor’s Field Office except as otherwise agreed.

C. 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.

D. Minimum Agenda:
1. Review, modify / approve minutes of the previous meeting.
2. Review work progress since last meeting.
3. Note field observations, problems and decisions.
4. Identify problems that impede planned progress.
5. Review off-site fabrication problems.
6. Revise construction schedule as indicated.
7. Plan progress during the next work period.
8. Review submittal schedules; expedite and modify as required.
9. Review proposed changes,
10. Review Request for Payment.
11. Complete other current business.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01320 CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope: Provide projected Construction Schedules for entire Work and revise monthly to show progress through the pay period. The following is a minimum requirement and other type schedules are acceptable with Owner's approval.

B. Form of Schedules: Prepare in form of horizontal bar chart.

1. Provide separate horizontal bar column for each trade or operation.
2. Order: Table of Contents of Specifications.
3. Identify each column by major Specification section number.
4. Horizontal Time Scale: Identify first work day of each week.
5. Scale and Spacing: To allow space for updating.

C. 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.

D. Updating:

1. Show all changes occurring since previous submission of updated schedule.
2. Indicate progress of each activity and completion dates.

E. Submittals:

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.

F. 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.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01330 SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Scope: Submit to the Project Engineer 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 01630 – Product Options and Substitution Procedures, for requirements concerning products that will be acceptable on this Project.

B. Shop Drawings: Original **(legible)** drawings prepared by Contractor, Subcontractor, Supplier or Distributor which illustrate actual portions of the Work; showing fabrication, layout, setting or erection details. Reproductions of the Contract Drawings will **not** be acceptable. Minimum requirements for Shop Drawings shall include the following:

1. Prepared by a qualified detailer.
2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
3. Minimum sheet size: 8-1/2 inches by 11 inches.
4. Reproductions for submittals: 7 Prints. Submit 8 prints if they are Plumbing, Mechanical or Electrical Submittals.
5. Shop Drawings shall be stamped and signed by the Contractor certifying accuracy, completeness and compliance with Contract requirements prior to submitting to the Project Engineer.

C. Product Data: Provide 7 copies each. Provide 8 copies if they are Plumbing, Mechanical or Electrical Submittals. Minimum information submitted shall include the following:

1. Manufacturer's standard schematic drawings: Modify drawings to delete information that is not applicable to the Project. Supplement standard information to provide additional information applicable to Project.
2. Manufacturer’s catalog sheets, brochures, diagrams, schedules, performance charts, illustrations and other standard descriptive data: **Clearly mark** each copy to identify pertinent materials, products or models. Show dimensions and clearances required. Show performance characteristics and capacities, wiring diagrams and controls.
3. Product Data shall be stamped and signed by the Contractor certifying accuracy, completeness and compliance with contract requirements prior to submitting to the Project Engineer.

D. Samples: Provide physical examples to illustrate materials, equipment or workmanship and to establish standards by which completed Work is judged.

1. Provide one copy each of sufficient size and quantity to clearly illustrate functional characteristics of products or material with integrally related parts and attachment devices and full range of color samples.
2. Samples remain the property of the MDOT Architect until completion of construction of the Project.
3. Samples will not be required when specified product is submitted.
4. If a specified product color is discontinued, Contractor shall notify Project Engineer / MDOT Architect promptly to determine if it affects other color selections.

E. Field Samples and Mock-Ups: Erect on Project Site at location acceptable to Project Engineer / MDOT Architect.

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 / MDOT Architect. 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. Contractor Responsibilities:

1. Review Shop Drawings, product data, and samples prior to submission.
2. Verify field measurements, construction criteria, catalog numbers and other data.
3. Coordinate each submittal with requirements of Work and Contract Documents.
4. Contractor's responsibility for errors and omissions in submittals is not relieved by Project Engineer / MDOT Architect's review of submittals.
5. Contractor's responsibility for deviations in submittals from requirements of Contract Documents is not relieved by MDOT Architect's review of submittals unless MDOT Architect gives written acceptance of specific deviations.
6. Notify MDOT Architect in writing at the time of submission, of deviations in submittals from requirements of Contract Documents.
7. Order no materials or begin no Work requiring submittals until the return of submittals bearing MDOT Architect's stamp and initials indicating review.
8. After MDOT Architect's review, distribute copies.

G. Submission Requirements:

1. Schedule submission with ample time given to review submittals prior to being needed.
2. Submit 7, 8 if Plumbing, Mechanical or Electrical copies of Shop Drawings and number of copies of product data which Contractor requires for distribution.
3. Submit number of samples specified in each Specification Section.
4. Accompany submittals with transmittal letter, in duplicate, 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.
5. Submittals shall include the following:

    a. Date and revision dates.
    b. Project title and number.
    c. The names of Project Engineer, Architect/Engineer, Contractor, Supplier, Manufacturer, and separate detailer, when pertinent.
    d. Identification of product or material.
    e. Relation to adjacent structure or materials.
    f. Field dimensions, clearly identified as such.
    g. **Specification Section Number**.
    h. Applicable standards such as ASTM Number or Federal Specification.
    i. A blank space, 2 inches by 3 inches for the Project Architect’s stamp.
    j. Identification to deviations from Contract Documents.
    k. Contractor's stamp, initialed or signed, certifying the review of submittal, verification of field measurements, and compliance with Contract Documents.

H. Resubmission Requirements:

1. Shop Drawings: Revise initial Drawings as required and resubmit as specified for initial submittal. Indicate on Drawings, any changes that have been made other than those required by Architect / Engineer.
2. Product Data and Samples: Submit new data and samples as required for initial submittal.

I. Distribution of Submittals after Review:

1. Distribute copies of Shop Drawings and product data which carry MDOT Architect's stamp to: Project Engineer's File, MDOT Architect's File, Architect's File (as required), Electrical / Mechanical Engineer's File (as required), Materials' File, Contractor's File, Job Site File, and Subcontractor, Supplier and/or Fabricator as necessary.
2. Distribute samples as directed. The Project Engineer / MDOT Architect shall retain one of each.

J. Architect / Engineer's Duties:

1. Review submittals with reasonable promptness.
2. Review for design concept of Project and information given in Contract Documents.
3. Review of separate item does not constitute review of an assembly in which item functions.
4. Affix stamp and initial, or signature, certifying the review of submittal.
5. Return submittals to the MDOT Architect, who will forward one copy to the Project Engineer, one copy to the Materials Engineer and the balance to the Contractor for distribution.
6. Retain one copy of accepted submittals.

K. Delays attributable to untimely submittals, submittals not approved, or time taken to resubmit will not serve as a basis for a Contract Time extension.

L. Acceptance of submittal items will not preclude rejection of these items upon discovery of defects in them prior to final acceptance of completed Work.

M. 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 MDOT Architect, 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 (Not Used)

PART 3 EXECUTION (Not Used)

END OF SECTION

SECTION 01355 RENOVATION PROJECT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDE

A. 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. The Work to be assigned, coordinated and scheduled includes, but is not limited to, the following:

1. The work of each Division and Section of the Specifications as shown on the Drawings and in the Specifications.
2. The 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. Interpretations of Contract Documents:

   a. Consultation: Consult with MDOT Architect to obtain interpretations.
   b. Assistance: Assist in resolution of any questions.
   c. Stop all 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 01455.
   b. Temporary Facilities and Controls: Allocate, maintain and monitor all temporary facilities. Refer to Section 01500.
   c. Cutting and Patching: Supervise and control all cutting and patching. Refer to Section 01735.
   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 01740.
   e. Project Record Documents: Maintain up-to-date project record documents. Refer to Section 01785.

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 who 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 Sections 01310 and 01315.

B. Require attendance by all affected Parties.

1.05 CONSTRUCTION ACCESS: 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: Verify that demolition is complete and areas are ready for beginning of repairing, refinishing and new construction.

3.02 PREPARATION: 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 01740.

END OF SECTION

SECTION 01425 REFERENCE DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification and purpose of Reference Documents.

B. Administrative procedures and responsibility for the use of Reference Documents.

1.02 IDENTIFICATION AND PURPOSE

A. 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.

B. Purpose: All named and otherwise identified "Reference Documents" 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.

1.03 PROCEDURES AND RESPONSIBILITIES

A. Compliance with Laws and Codes of governmental agencies having jurisdiction shall be mandatory and take precedence over the requirements of all other Reference Documents. 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. Should specified reference standards conflict with regulatory requirements or the Contract Documents, request MDOT Architect's clarification before proceeding.

B. 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.

C. When date of Reference Document is not specified, conform to latest edition of said Document except when earlier editions are specifically required by Codes.

D. 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.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01455 TESTING LABORATORY SERVICES

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 02315, Excavation, Filling, and Grading.
2. Section 03200, Concrete Reinforcement.
3. Section 03300, 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 of 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, fabricator, or laboratory.
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 reports 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.
5. Signature of a responsible laboratory official.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

SECTION 01500 TEMPORARY FACILITIES AND CONTROLS

1.01 GENERAL: Establish and initiate use of each temporary facilities at time first reasonably required for proper performance of the Work. Terminate use and remove facilities at earliest reasonable time, when no longer needed or when permanent facilities have, with authorized use, replaced the need.

1.02 FIELD OFFICE AND STORAGE FACILITIES: The Contractor shall be responsible for construction of the field office. The Contractor shall provide, maintain, and remove when directed, suitable substantial and watertight temporary field office and storage shed(s), in locations on the site as directed by the Project Engineer, or his authorized representative and best suited for their respective uses, as follows:

A. Field Office (one required): For the use of the Contractor, the Project Engineer and his representative(s), and the MDOT Architect and his representative(s), and Consultants. Provide in office suitable furniture for plan layout, progress meetings, and storage. Storage files and racks will maintain 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. Also, provide lights, heat, air-conditioning, fax machine and telephone. Maintain each office in a sanitary and usable condition. Provide platform, steps and handrails at entrance as required. Contractor shall provide the Project Engineer and MDOT Architect with job site and emergency telephone numbers.

B. Storage Facilities: 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.

1.03 TEMPORARY TOILET FACILITIES: The Contractor shall be responsible for providing portable structure for the exclusive use as temporary toilet facilities for the Public. Suitable, substantial, and watertight temporary structure shall be provided in location on the site as directed by the Project Engineer, or his authorized representative, maintained, and removed from the site at Project completion.

1.04 TEMPORARY OFFICE FACILITIES FOR TOURISM STAFF: The Contractor shall be responsible for providing portable structure for the exclusive use as temporary office facilities for tourism staff. Suitable, substantial, and watertight temporary structure shall be provided in location on the site as directed by the Project Engineer, or his authorized representative, maintained, and removed from the site at Project completion.

1.05 TEMPORARY STROAGE FACILITIES FOR TOURISM STAFF: The Contractor shall be responsible for providing portable structure for the exclusive use as temporary storage facilities for tourism staff. Suitable, substantial, and watertight temporary structure shall be provided in location on the site as directed by the Project Engineer, or his authorized representative, maintained, and removed from the site at Project completion.

1.06 FURNISHING AND MAINTENANCE OF EQUIPMENT: Furnish and maintain all equipment such as temporary ramps, scaffolds, hoists, runways, derricks, chutes, elevators, etc. as required for proper execution of the Work of all trades. All such apparatus, equipment and construction shall meet all the requirements of the Labor Law and other applicable State or local laws.

1.07 ELECTRIC LIGHTS AND POWER: Supply lights and power when necessary for the progress of the Work. The operating costs shall be borne by the Owner. Temporary wiring, where required, shall be run in conduits.

1.08 WATER: Supply water service. The operating costs shall be borne by the Owner.

1.09 ROADS AND ACCESS: The drive is to remain open at all times. A flagman will be required to control traffic when construction vehicles are present.

1.10 TOILETS FOR WORKMEN: Provide and maintain all necessary toilets for workmen. Toilets are to be maintained in strict accordance with the regulations of the State Board of Health. The toilets are to be located on the site as directed by the Project Engineer or his authorized representative.

1.11 SECURITY / PROTECTION PROVISIONS

A. The types of temporary security and protection provisions required include, but are not limited to, fire protection, barricades, warning signs / lights, personnel security program (theft prevention), environmental protection, and similar provisions intended to minimize property losses, personal injuries and claims for damages at Project Site.

B. Barricades and Construction Fence: Provide and erect all necessary barricades and any other protection required. Provide all necessary warning and danger lights from twilight to sunrise.

C. Fire Extinguishers: Provide types, sizes, numbers and locations as would be reasonably effective in extinguishing fires during early stages, by personnel at project site. Provide Type A extinguishers at locations of low potential for either electrical or grease/oil flammable liquid fires: provide Type ABC dry chemical extinguishers at other locations; comply with recommendations of NFPA No. 10. Post warning and quick-instructions at each extinguisher location, and instruct personnel at Project Site, at time of their first arrival, on proper use of extinguishers and other available facilities at Project Site. Post local fire department call number on each telephone instrument at Project Site.

D. 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.

E. Water Control: Provide pumps as required to keep the excavation free from standing water and shall slope the excavation to prevent water from running toward existing buildings at all times.

1.12 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.

1.13 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 Architect.

1.14 FIRE HAZARDS: Special precautions shall be taken to reduce fire hazards where electrical or gas welding or cutting Work is done and suitable fire extinguishing equipment shall be maintained near such operations.

1.15 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.

PART 2 PRODUCTS

2.01 TEMPORARY TOILET FACILITIES: Furnish Unit #173345 as manufactured by GE Capital Modular Space or approved equal. Submittals are required for MDOT Architect's approval prior to delivery.

A. Dimensions: All dimensions are minimum outside dimensions. 12 ft. wide x 32 ft. long x 7 ft. headroom.

B. Toilet Facilities: Provide satisfactory indoor enclosed toilet facilities with one ADA toilet stall for each sex, including all toilet accessories meeting all applicable codes. Temporary toilet facilities floor plan and outline specifications shall be submitted for the MDOT Architect's approval prior to delivery to site.

C. Doors: The building shall have a minimum of two standard height solid 3' wide entrance doors (one for women and one for men) complete with locks and at least two keys. Provide a 5 ft. x 5 ft. wood landing, wood ramp, and painted galvanized metal handrails meeting ADA requirements at each entrance door or common to both doors.

D. Floors and walls: Standard sub-floor and wood stud construction will be accepted with nonporous finish.

E. Ceilings: Standard ceiling construction will be accepted.

F. Roof: The roof shall be watertight and shall slope away from entrance door if practicable. An arched roof without eaves will be accepted.

G. Insulation: At least 1 1/4-inch thickness of rock wool, fiber glass or other non-flammable insulating material shall be placed in walls and ceiling.

H. Utilities: All utilities, including water, sewage, electricity shall be connected to existing service source ready for use prior to occupancy. Lighting shall provide a minimum of 70-foot candles of light. Heating and cooling shall be thermostatically controlled.

I. HVAC: The electric heating and air conditioning shall maintain an inside temperature of 72 degrees plus or minus 4 degrees.

J. Ownership and Use: The temporary toilets shall be furnished and kept in good working order by the Contractor during the entire time the existing Welcome Center is being renovated. All appurtenances shall be furnished, located and made ready for use by the Public and Tourism Staff as a **first item of Work**. Work shall not proceed on the demolition of the Welcome Center until the temporary facilities are set up and in good working order.

2.02 TEMPORARY OFFICE FACILITIES FOR TOURISM STAFF: Furnish Unit #GSD-1248 as manufactured by GE Capital Modular Space or approved equal. Submittals are required for MDOT Architect's approval prior to delivery.

A. Dimensions: All dimensions are minimum outside dimensions. 12 ft. wide x 44 ft. long x 7 ft. headroom.

B. Interior Spaces: Provide Reception Area to include 72 inches long x 36 inches deep x 42 inches high reception counter. Provide minimum of one separate 12 ft. x 12 ft. office, one half-bath including all toilet accessories meeting all ADA requirements and applicable codes, one coffee bar with sink and one closet. Temporary facilities floor plan and outline specifications shall be submitted for approval prior to delivery to site.

C. Doors: The building shall have a minimum of two standard height solid 3 ft. wide entrance doors complete with locks and at least two keys. Provide a 5 ft. x 5 ft. wood landing, wood ramp, and painted galvanized metal handrails meeting ADA requirements at entrance to Reception Area door and steps with 5 ft. x 5 ft. wood landing to the Office door.

D. Floors and walls: Standard sub-floor and wood stud construction will be accepted with vinyl tile floor finish and finished walls.

E. Ceilings: Standard ceiling construction will be accepted.

F. Roof: The roof shall be watertight and shall slope away from entrance door if practicable. An arched roof without eaves will be accepted.

G. Insulation: At least 1 1/4-inch thickness of rock wool, fiber glass or other non-flammable insulating material shall be placed in walls and ceiling.

H. Utilities: Electricity shall be connected to existing service source ready for use prior to occupancy. Lighting shall provide a minimum of 70-foot candles of light on all working surfaces. Provide a minimum of three electrical convenience outlets and one combination phone / computer outlet in Reception Area and Office and two additional electrical outlets in Reception Area. Heating and cooling shall be thermostatically controlled.

I. HVAC: The electric heating and air conditioning shall maintain an inside temperature of 72 degrees plus or minus 4 degrees.

J. Ownership and Use: The temporary office building shall be furnished and kept in good working order by the Contractor during the entire time the existing Welcome Center is being renovated. All appurtenances shall be furnished, located and made ready for use by the Public and Tourism Staff as a **first item of Work**. Work shall not proceed on the demolition of the Welcome Center until the temporary facilities are set up and in good working order.

2.03 TEMPORARY STORAGE FACILITIES FOR TOURISM STAFF: Furnish Unit as manufactured by GE Capital Modular Space or approved equal. Submittals are required for MDOT Architect's approval prior to delivery.

A. Dimensions: All dimensions are minimum outside dimensions. 12 ft. wide x 24 ft. long x 7 ft. headroom.

B. Interior Spaces: Provide minimum of two separate 12 ft. x 12 ft. rooms, meeting all ADA requirements and applicable codes. Temporary facilities floor plan and outline specifications shall be submitted for approval prior to delivery to site.

C. Doors: The building shall have a minimum of two standard height solid 3 ft. wide entrance doors complete with locks and at least two keys. Provide steps with 5 ft. x 5 ft. wood landing, and painted galvanized metal handrails meeting ADA requirements at doors.

D. Floors and walls: Standard sub-floor and wood stud construction will be accepted with finished walls.

E. Ceilings: Standard ceiling construction will be accepted.

F. Roof: The roof shall be watertight and shall slope away from entrance door if practicable. An arched roof without eaves will be accepted.

G. Insulation: At least 1 1/4-inch thickness of rock wool, fiber glass or other non-flammable insulating material shall be placed in walls and ceiling.

H. Utilities: Electricity shall be connected to existing service source ready for use prior to occupancy. Lighting shall be provided. Provide a minimum of two electrical convenience outlets. Heating and cooling shall be thermostatically controlled.

I. HVAC: The electric heating and air conditioning shall maintain an inside temperature of 72 degrees plus or minus 4 degrees.

J. Ownership and Use: The temporary storage building shall be furnished and kept in good working order by the Contractor during the entire time the existing Welcome Center is being renovated. All appurtenances shall be furnished, located and made ready for use by the Tourism Staff as a **first item of Work**. Work shall not proceed on the demolition of the Welcome Center until the temporary facilities are set up and in good working order.

PART 3 EXECUTION

3.01 TEMPORARY FACILITIES LOCATIONS: Locate temporary toilet and office facilities in locations as shown on Drawings or as directed by Project Engineer. Install facilities as per manufacturer's recommendations. Connect all temporary utilities according to codes and to not be a hazard to the public.

3.02 TEMPORARY FACILITIES: The temporary buildings shall be removed from the site at Substantial Completion after written approval of the Project Engineer.

END OF SECTION

SECTION 01610 BASIC PRODUCT REQUIREMENT

PART 1 GENERAL

1.01 SECTION INCLUDES: The products of The Work and the requirements for their quality, delivery, handling, storage, protection and installation.

1.02 DEFINITIONS

A. "Products". Defined as: The materials, machinery, equipment, components, and systems, in whole or in part, incorporated into The Work. "Products" does not include materials, tools, devices, machinery, equipment and systems used for the preparation, manufacture, fabrication, conveying and installation of The Work.

B. "Level of Excellence". Defined as: The degree of quality for the Products and Workmanship of this Project. The required "degree of quality" shall be established on the basis of one or more of the following criteria which shall become the minimum acceptable "level of excellence" for the work of this Project:

1. Products selected by Architect.
2. Architect's Specifications.
3. Reference Standards.
4. Manufacturer's Instructions.
5. Industry Standards.

In the absence of all the criteria from the Specifications Section, the normal local Industry Standard shall prevail. The Party or Parties responsible for the required work shall be experienced in the work to be provided; shall have knowledge as to what, in the local area, constitutes "good and acceptable practice" in producing the completed work of this Section, and will be expected to provide nothing less.

Example: Masonry and Drywall Contractors are expected to know that Industry Standards, "good practice", and "common sense" dictate, to prevent cracks in the completed work, control joints must be installed at minimum distances or should be placed in certain locations where movement or other stress conditions are likely to occur. When such items are not specified or shown on the Drawings, the Contractor will be expected to request the MDOT Architect's clarification for location (primarily for esthetic considerations) and then provide not less than the minimum Industry Standard, at no additional cost to the Owner.

C. "Standard of Quality". Defined as: A specific and particular manufacturer whose product(s) has / have been selected by the Architect as amply suitable to meet the Project requirements in one or more of the following criterions: appearance, physical attributes, performance characteristics, appropriateness for intended use, and cost.

The work of the individual Specification Section will be based on product(s) of the "Standard of Quality Manufacturer" and the product(s) of that manufacturer, designated within the Specifications Section by catalog number(s) (or other identification), shall become "Standard of Quality Product(s) and the basis by which the product(s) of "Other Acceptable Manufacturers", and any substitutions, are judged.

In the absence of the designation "Standard of Quality", such as for generic product, material or system, then the specified item (product, material or system) shall be the reference standard and shall become the "Standard of Quality".

D. "Equivalent Products". Defined as: Products having a level of excellence which, in the Architect's judgment, is equal to the level of excellence established by the product(s) selected as Architect's "Standard of Quality".

E. "Manufacturer". Defined as: An entity whose principal business is the manufacturing, fabricating, assembling, and / or supplying of products / systems from off site for incorporation (in whole, or in part, such as components of a system) into the construction at the Project Site.

1. The Architect's selection of a particular manufacturer usually is on the basis of the manufacturer's reputation within the Construction Industry, and / or "track record" with the Architect, for producing quality products on time, and providing responsive follow-up and reliable warranties.
2. The terms "Fabricator" and "Supplier" used in these Specifications shall be synonymous with "manufacturer".

F. "Other Acceptable Manufacturers". Defined as: Manufacturers who have qualifications and products similar to those of the "Standard of Quality" Manufacturer (see above) selected by Architect and are therefore "acceptable" to offer any of their products considered to be "equivalent" to the specified product(s).

1. To the best of the Architect's knowledge, information and belief, the manufacturers, listed as "Other Acceptable Manufacturers", now have products available that are considered to be "equivalent" to the specified product (or selection) of the "Standard of Quality" Manufacturer. Where no "Standard of Quality" is indicated then any of the "Acceptable Manufacturers" listed may offer products complying with the specified requirements.
2. The inclusion of particular manufacturers as "Other Acceptable Manufacturers" does not signify that other (that is, unlisted) manufacturers are not acceptable or that they do not have equivalent products nor does the omission of any manufacturer's name indicate unacceptability for any reason.
3. Manufacturers, who are not listed in the Contract Documents, and who desire consideration, must submit their product under provisions of Section 01630-Product Options and Substitutions Procedures.

1.03 QUALITY ASSURANCE – GENERAL

A. The quality of all products and workmanship shall be in accordance with the provisions of this Section and the requirements of the individual Specifications Section.

B. Whenever a "level of excellence" higher than the minimum industry standard is expected for products and workmanship, the more rigid standards and precise requirements will be indicated within individual Specifications Sections.

Example: For whatever reason, the Architect may specify a "dry film thickness (DFT)" for a coating that is more than the manufacturer's recommendation or than normally available in a three coat system. It shall be the Contractor's responsibility to achieve the required DFT with one or more additional coats, none of which shall be more than the manufacturer's recommendation for wet film thickness, for a single coat, when applied.

C. Establishing and maintaining Project Quality Control shall be the responsibility of the Contractor.

1.04 QUALITY ASSURANCE – PRODUCTS

A. All products incorporated into The Work shall be new except where otherwise provided by the Contract Documents and shall comply with the requirements of the individual Specifications Sections and as supplemented herein. All products incorporated into the Work shall be asbestos free. Products containing asbestos are not acceptable and will be considered as defective material. Whenever these products containing asbestos are discovered, they shall be removed from the Work at no cost to the Owner. Contractor shall certify that all materials incorporated into the Work are asbestos free, refer to Section 01770 - Closeout Procedures.

B. Matching / Mating of Products:

1. Products required in quantity within a Specifications Section shall be the same, and shall be interchangeable.
2. All manufactured products exposed to view, especially those considered as "Finishes" (including, but not limited to, items as floor material, wall coverings, glass, paint ceiling tile, that are installed or applied directly from manufacturer's containers), shall be of the same factory "run".
3. The Contractor is expected to secure a sufficient quantity with initial purchase to avoid running short. Materials within an area that do not match, as a result of such failure, will be cause to reject all materials and will not be grounds for additional compensation.

C. Extra Materials: When required by individual Specifications Sections, provide products, spare parts and maintenance material in condition and quantities required. All "extra materials" shall be of the same factory "run" as installed materials. Deliver to Project Site, properly store in appropriate locations, and obtain receipt from authorized person prior to Final Payment.

1.05 QUALITY ASSURANCE – WORKMANSHIP

A. Comply with the "level of excellence" required by individual Specifications Sections. In the absence of specific requirements, comply with product(s) manufacturer's instructions and Industry Standards.

B. Use only suitably qualified craftsmen to produce work of the specified quality.

1. Craftsmen shall be of excellent ability, thoroughly trained and experienced in types of work required, completely familiar with the quality standards, procedures and materials required.
2. In the acceptance or rejection of manufactured and / or installed work, the Architect will make no allowance for the lack of skill on the part of workmen.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

D. Provide finishes to match approved samples.

E. Adjusting of Operating Products: As follows:

1. Adjust moving parts of product / equipment (including, but not limited to, doors, drawers, hardware, appliances, mechanical and electrical equipment) to ensure smooth and unhindered operation and movement at time when Owner assumes control of item's use.
2. All items shall be properly set, calibrated, balanced, lubricated, charged, and otherwise prepared and ready for intended use.
3. Starting of Systems: When specified in individual Sections, require manufacturer's representative to be present at the Site to inspect, check, and approve equipment installation prior to start-up; to supervise placing equipment in operation; and to certify by written report that equipment has been properly installed, adjusted, lubricated, and satisfactorily operated under full load conditions.
4. Equipment/systems Demonstrations and Personnel Instruction: When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems and to instruct Owner's personnel on proper operation and maintenance manuals as basis of instruction and demonstration. Include start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at schedule times, at equipment location.

1.06 TRANSPORTATION AND HANDLING

A. Transport products by means and methods to avoid product damage; deliver in undamaged condition in manufacturers' unopened containers or packaging, keep dry.

B. Provide equipment and personnel to handle products by means to prevent soiling or damage.

C. Promptly inspect shipments for compliance with requirements, quantities, and damage.

1.07 STORAGE AND PROTECTION

A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weathertight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions. Protect prefinished surfaces from damage or deterioration by acceptable means; do not use adhesive papers, sprayed or strippable coatings that bond when exposed to sunlight or weather.

B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering (do not use "Visqueen" or other polyethylene sheeting when subject to direct sunlight); provide ventilation to avoid condensation.

C. Store loose granular materials on solid surface in a well-drained area; prevent mixing with foreign matter.

D. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under specified conditions and are fit for use.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01630 PRODUCT OPTIONS AND SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Scope: To give the product options available to the Contractor and to set forth the procedure and conditions for substitutions.

1.02 CONTRACTOR'S OPTIONS

A. For products specified only by reference standards, select any product meeting standards by any manufacturer.

B. For 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. Substitution will **not** be granted unless reasons are considered justified.

C. For product 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.

D. For 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

E. For 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.

1.03 PRODUCT SUBSTITUTION LIST

A. Within 45 days after Notice to Proceed, submit to the MDOT Architect 4 copies of complete list of all proposed product substitutions.

B. Tabulate list by each Specification Section.

C. For named products specified with reference standards, include with listing of each product:

1. Name and address of manufacturer.
2. Trade name.
3. Model or catalog designation.
4. Manufacturer's data.
5. Performance and test data.
6. Reference standards.

D. Proposed product will be reviewed for incorporation into the Project. Contractor will be notified for substitution rejection if not allowed, or will be instructed to submit in standard substitution submittal process for approval.

1.04 SUBSTITUTIONS

A. The MDOT Architect will consider formal written requests from Contractor for substitution of products in place of those specified. Only **one** request per product will be allowed. Refer to Section 01330 - Submittal Procedures. Include in request:

1. Complete data substantiating compliance of proposed substitutions with Contract Documents.
2. For products:
   a. Product identification including manufacturer's name and address.
   b. Manufacturer's literature: Submit literature of actual product specified and literature of proposed substitution with all comparable features or components highlighted. Highlighted information is to include, but shall not be limited to, product description, performance, test data and reference standards.
   c. Samples of the proposed substitution.
   d. Name and address of 3 similar projects on which product was used and date of installation.
3. For construction methods:
   a. Detailed description of proposed method.
   b. Drawings illustrating methods.
4. Itemized comparison of proposed substitution with product or method specified.
5. Data relating to changes in construction schedule.
6. Accurate cost data on proposed substitution in comparison with product or method specified.

B. In making request for substitution, Contractor represents:

1. He 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.
2. He will provide the same guarantee for substitution as for product or method specified.
3. He will coordinate installation of accepted substitution into Work, making such changes required of Work to be complete in all respects.
4. He waives all claims for additional costs related to substitution that consequently becomes apparent.
5. Cost data is complete and includes all related costs under his Contract.

C. Substitutions will **not** be considered if:

1. They are indicated or implied on Shop Drawings or product data submittals without formal request submitted in accordance with this Section.
2. Acceptance will require substantial revision of Contract Documents.
3. In the MDOT Architect's judgment, the product or material is not equal.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01735 CUTTING AND PATCHING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Scope: To set forth broad general conditions covering cutting and patching that applies to everyone and everything on the job.

B. Execute cutting including excavating, fitting or patching or work required to:

1. Make several parts fit properly.

2. Uncover work to provide for installation of ill-timed work.

3. Remove and replace defective work.

4. Remove and replace work not conforming to Contract requirements.

5. Install specified work in existing construction.

C. In addition to Contract requirements, upon MDOT Architect's written instructions:

1. Uncover work for observation of covered work.

2. Remove samples of installed materials for testing.

3. Remove work to provide alteration of existing work.

D. Do not cut or modify work of another Contractor without his consent.

E. Payment for Costs: Costs caused by ill-timed, defective or work not conforming to the Contract will be borne by party responsible for ill-timed, defective or non-conforming work.

PART 2 PRODUCTS

2.01 GENERAL: Materials for replacement of work removed shall comply with individual Specifications Sections for type of work to be done.

PART 3 EXECUTION

3.01 GENERAL

A. Inspection: Inspect existing conditions of work, including elements subject to movement or damage during cutting and patching.

B. Preparation prior to cutting: Provide shoring, bracing and supports required to maintain structural integrity. Provide protection for other portions of project and protection from the elements.

C. Performance:

1. Execute cutting and demolition of methods that prevent damage to other work and will provide surfaces to receive installation of repairs and new work.

2. Execute excavating and backfilling by methods that prevent damage to other work and prevent settlement

3. Restore work that has been cut or removed install new products to provide completed work in accordance with requirements of the Contract Documents.

4. Refinish entire surfaces as necessary to provide an even finish. Refinish continuous surfaces to the nearest intersection and assemblies.

END OF SECTION

SECTION 01740 CLEANING

PART 1 GENERAL

1.01 SUMMARY

A. Scope: Maintain premises and public properties from accumulations of waste, debris, and rubbish, caused by operations. At completion of Work, remove waste materials, rubbish, tools, equipment, machinery and surplus materials and clean all sight-exposed surfaces; leave project clean and ready for occupancy.

B. Dispose of all waste, debris and rubbish in accordance with the 0wner's requirements.

PART 2 PRODUCTS

2.01 MATERIALS: Use only cleaning materials recommended by the manufacturer of surface to be cleaned, but cross reference cleaning materials used on surfaces to insure they are recommended by the cleaning material manufacturer.

PART 3 EXECUTION

3.01 DURING CONSTRUCTION

A. Execute cleaning to insure that structure, grounds, and surrounding properties are maintained free from accumulations of waste materials and rubbish. Wet down dry materials and rubbish to lay dust and prevent blowing dust. Clean site and surrounding properties at reasonable intervals during progress of Work, and remove waste materials, debris and rubbish from site and legally dispose of at public or private dumping areas off MDOT owned property. Handle materials in a controlled manner with as few handling as possible; do not drop or throw materials from heights. Schedule cleaning operations so that dust or other contaminants resulting from cleaning process will not fall on wet or newly painted surfaces.

B. No materials may be disposed of by dumping them in the sanitary or storm sewer systems without specific approval by the Owner.

C. Washdown of cement trucks will be done at locations determined by the Project Engineer.

3.02 FINAL CLEANING

A. Employ experienced workmen, or professional cleaners, for final cleaning. In preparation for Inspection of structure, conduct final inspection of sight-exposed surfaces and concealed spaces. Remove grease, dust, dirt, stains, labels, fingerprints and other foreign materials from sight-exposed finished surfaces. Repair, patch and touch up marred surfaces to specified finish to match adjacent surfaces.

B. Broom clean paved surfaces; rake clean other surfaces of grounds.

C. Remove temporary fencing and leave in same condition as surrounding landscaped areas.

D. Keep Project clean until occupied by Owner.

END OF SECTION

SECTION 01770 CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION: The Scope of Work required under this Section consists of the Final Inspections, submitting of all closeout Documents and related items to complete the Work indicated on the Drawings and described in the Project Manual.

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 Section 15080 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: The Mississippi Department of Transportation presently does not recognize the term "Substantial Completion". Therefore, the Project is not complete and time does not end until all defects are remedied and Final Acceptance is given.

1.04 CLOSEOUT DOCUMENTS: 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:

A. Request for Final Payment: AIA Document G702, current edition, completed in full or a computer generated form having similar data.

B. Contractor's Affidavit of Payment of Debts and Claims: AIA Document G706, current edition, completed in full.

C. 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.

D. Consent of Surety Company to Final Payment: AIA Document G707, current edition, completed in full by the Bonding Company.

E. Power of Attorney: Closeout Documents should be accompanied by an appropriate Power of Attorney.

F. 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 Final Acceptance, except where specified for longer periods.

1. 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".

2. All guarantees and warranties shall be obtained in the Owner's name.

3. 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.

4. 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.

5. 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.

G. Project Record Documents: Furnish all other record documents as set forth in Section 01785 - Project Record Documents.

1. 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

H. Additional Documents Specified Within the Project Manual:

1. 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.

2. Maintenance Stock: Deliver to Owner all required additional maintenance materials as required in the various Sections of the Specifications.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 01785 PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope: To set forth the minimum procedure and requirements for keeping the Project Record Documents. One of these Documents is to be kept on site throughout the Project.

B. Maintenance of Documents:

1. Maintain 2 copies of all: Half-size Contract Drawings, Project Manual (Proposal), Addenda, Change Orders, Warranties, Certificates, Guarantees, Bonds, reviewed Shop Drawings, reviewed submittals (materials, fixtures, appliances, etc.), hardware schedules, field and laboratory test records, equipment brochures, spare parts lists, maintenance and operation manuals and other modifications to the Contract.

2. Store Record Documents apart from Documents used for construction.

3. Maintain Record Documents in clean, dry, and legible condition. Do not use Record Documents for construction purposes.

4. Make Record Documents available at all times for inspection by the Project Engineer, MDOT Architect and Owner.

C. Recording:

1. General: Mark all modifications in red pencils. Keep Record Documents current. Review log at Progress Meetings. Do not permanently conceal any Work until required information has been accurately recorded.

2. Contract Drawings: Legibly mark to record actual construction:

a. Horizontal and vertical location of underground and overhead utilities with their connections referenced to permanent surface improvements.
b. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
c. Field changes that involve dimension and detail.
d. Changes made by Supplemental Agreement (Change Order) or Field Order.

3. Project Manual (Proposal) and Addenda: Legibly mark up each Section to record manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

4. Shop Drawings: Maintain as Record Documents; legibly mark Drawings to record changes made after review.

D. Submittals:

1. Furnish two (2) copies of all Record Documents.

2. The information, except Contract Drawings, shall be arranged and labeled by corresponding Specification Section, neatly bound in three ring binders, indexed, and all drawings readable without being removed or unstapled.

3. The name and address of each subcontractor and material supplier shall be listed in front of each binder along with the Project Manual (Proposal).

4. 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.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION
Not Used

END OF SECTION

SECTION 02226 PARTIAL 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 is occupied and it will be necessary for materials stored in building to be relocated to different locations during the demolition and construction.

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 all exterior site items indicated on Drawings.
4. Removal of doors and frames indicated "remove".
5. Removal and protection of existing fixtures and equipment items indicated "salvage".

1.02 REMOVAL WORK SPECIFIED ELSEWHERE

A. Cutting non-structural concrete floors and walls for piping, ducts, and conduit is included with the Work of the respective mechanical and electrical Divisions 15 and 16 Specification Sections.

B. Remodeling and patching is included within the respective sections of Specifications, including removal of materials for re-use and incorporated into remodeling or new construction.

C. Relocation of pipes, conduits, ducts, fans, other mechanical and electrical work are specified by respective trades.

1.03 SUBMITTALS

A. At least 7 calendar days prior to beginning demolition submit schedule indicating proposed methods and sequence of operations for selective demolition Work to MDOT Architect for review prior to commencement of Work. Include coordination for shut-off, capping, and continuation of utility services as required, together with details for dust and noise control protection.

B. Provide detailed sequence of demolition and removal Work to ensure uninterrupted progress of Owner's on-site operations.

1.04 JOB CONDITIONS

A. Owner will vacate the existing building after the Contractor has finished the installation of the temporary toilet and office facilities. Provide minimum of twenty-one (21) calendar days advance notice to Owner of demolition activities to proceed in the existing building.

B. Condition of Structures: Owner assumes no responsibility for actual condition of items or structures to be demolished. Conditions existing at time of commencement of Contract will be maintained by Owner insofar as practicable. However, variations within structure may occur by Owner's operations prior to start of selective demolition Work.

C. Partial Demolition and Removal: Items indicated to be removed but of salvable value to Contractor may be removed from structure as Work progresses. Items indicated to be removed and turned over to Owner are to be removed from structure as Work progresses and stored as directed by Owner. Items requested at time of Pre-Construction Meeting to be turned over to Owner are to be removed from structure as Work progresses and stored as directed by Owner. Transport salvaged items not indicated to be turned over to Owner from site as they are removed. Storage or sale of removed items not indicated to be turned over to Owner on site will not be permitted.

1.05 PROTECTIONS

A. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition Work.

B. Provide protective measures as required providing free and safe passage of Owner's personnel and general public to and from occupied portions of the site.

C. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or element to be demolished, and adjacent facilities or work to remain.

D. Protect from damage existing finish Work that is to remain in place and becomes exposed during demolition operations.

E. Protect floors with suitable coverings when necessary.

F. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or extensive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.

G. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces, and installation of new construction to insure that no water leakage or damage occurs to structure or interior areas of existing building.

H. Remove protections at completion of work.

1.06 DAMAGES: Promptly repair damages caused to adjacent facilities by demolition Work at no cost to Owner.

1.07 TRAFFIC

A. Conduct selective demolition operations and debris removal in a manner to ensure minimum interference with roads, streets, walks, corridors, and other adjacent occupied or used facilities.

B. Do not close, block or otherwise obstruct streets, walks, entrances, canopies, or other occupied or used facilities without written permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by Owner.

1.08 EXPLOSIVES: Use of explosives will not be permitted.

1.09 UTILITY SERVICES

A. Maintain existing utilities indicated to remain, keep in service, and protect against damage during demolition operations.

B. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to governing authorities.

1.10 ENVIRONMENTAL CONTROLS

A. Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in air to lowest practical level. Comply with governing regulations pertaining to environmental protection.

B. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART 2 PRODUCTS
Not Used

PART 3 EXECUTION

3.01 INSPECTION: Prior to commencement of selective demolition work, inspect areas in which Work will be performed. Photograph existing conditions to structure surfaces, equipment or to surrounding properties which could be misconstrued as damage resulting from selective demolition Work; file with Project Engineer prior to starting Work.

3.02 PREPARATION

A. Provide interior and exterior shoring, bracing, or support to prevent movement, settlement or collapse of structures to be demolished and adjacent facilities to remain. Cease operations and notify the Project Engineer immediately if safety of structure appears to be endangered. Take precautions to support structure until determination is made for continuing operations.

B. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the site.

C. Provide weatherproof closures for exterior openings resulting from demolition Work.

D. Locate, identify, stub out and disconnect utility services that are not indicated to remain. Provide by-pass connections as necessary to maintain continuity of service to occupied areas of other buildings on site. Provide minimum of 7 calendar days advance notice to Owner if shutdown of service is necessary during changeover. Schedule electrical shut-offs to begin at 6:00 a.m., Saturdays, unless indicated otherwise by Project Engineer.

3.03 DEMOLITION

A. Perform selective demolition Work in a systematic manner. Use such methods as required to complete Work indicated on Drawings in accordance with demolition schedule and governing regulations. Schedule demolition at times acceptable to the Owner, which may include after-hours or weekends.

B. All cutting and patching shall be done in such a manner that at all times the building shall remain dust free and dry at no additional cost to the Owner. All patching upon completion shall meet the following requirements:

1. Blend with the existing materials.
2. Shall be painted.
3. Shall have trim, gaskets, and / or sealant for water and vermin tight construction.

C. Caution and protective measures shall be used and in place before cutting of any metal or other materials that might spark a fire from combustible oils, dusts, rags, etc.

D. Demolish concrete in small sections. Cut concrete at junctures with construction to remain using power-driven masonry saw or hand tools.

E. Locate demolition equipment throughout structure and promptly remove debris to avoid imposing excessive loads on supporting walls, floors, or framing.

F. Provide services for effective air and water pollution controls as required by local authorities having jurisdiction.

G. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Project Architect in written, accurate detail. Pending receipt of directive from Owner's representative rearrange selective demolition schedule as necessary to continue overall job progress without delay.

3.04 SALVAGE MATERIALS

A. Where indicated on drawings as "Salvage" or "To be Reused", carefully remove indicated items, clean, store and protect for later reuse and installation.

B. As directed in the Pre-Construction meeting as specific items to be salvaged and given to the Owner, carefully remove indicated items and store where directed by Project Architect.

3.05 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.

B. If hazardous materials are encountered during demolition operations, comply with applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

C. Burning of removed materials is not permitted on project site.

D. Contractor is required to provide a dumpster for this Project and is not to use the Owners dumpster at any time. Location of the Contractor's dumpster is to be coordinated with the Project Architect.

3.06 CLEAN-UP AND REPAIR

A. Upon completion of demolition Work, remove tools, equipment and demolished materials from site. Remove protections and leave interior areas broom clean.

B. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition Work. Repair adjacent construction or surfaces soiled or damaged by selective demolition Work.

END OF SECTION

SECTION 03100 CONCRETE FORMS AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES : All concrete formwork and other related items necessary to complete project indicated by Contract Documents unless specifically excluded.

1.02 RELATED ITEMS SPECIFIED ELSEWHERE

A. Section 03200 – Concrete Reinforcement.

B. Section 03300 – Cast-in-Place Concrete.

1.03 PROJECT CONDITIONS: Contractor shall 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 exterior grade plywood on studs and joists.

B. Form Ties: Standard snap ties, 1-1/2 inch break-back.

C. Form Oil: Approved non-staining type, "Noxcrete" or equal. Oil must not affect bonding of finishes on exposed concrete.

PART 3 EXECUTION

3.01 FORM CONSTRUCTION: Forms shall be properly aligned, adequately braced and mortar tight to produce concrete shapes required by Drawings. Align forms so that the actual surface does not vary from true surface more than l/8 inch. The surface shall be clean, undamaged, and free of offsets and irregularities at joints. Adequately brace and frame to retain true shapes under vibration and placing strains without leaks, bowing, or deflection.

A. 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. All walls shall consist of at least two 2 by 4's. Studs shall not be spaced more than l6 inches, girts not more than 24 inches and ties not more than 27 inches, on center.

B. 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.

C. Meet recommendations of "Recommended Practice for Concrete Form work" ACI 347 unless specified herein 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 put aluminum conduits in concrete.

3.03 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 l0 days after pour, providing compressive strength has reached a minimum of 2500 psi based on job cast cylinders.

END OF SECTION

SECTION 03200 CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES: All concrete reinforcing and the related items necessary to complete the Project indicated by the Contract Documents unless specifically excluded.

1.02 RELATED ITEMS SPECIFIED ELSEWHERE

A. Section 03100 – Concrete Forms and Accessories.

B. Section 03300 – Cast-in-Place Concrete.

1.03 SUBMITTALS

A. Submit reinforcing steel shop drawings and materials list prior to placement for MDOT Architect's approval. Shop drawings shall include complete placing plans, order lists, bend diagrams and details showing dimensions with clearances.

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.

1.04 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".

1.05 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.

1.06 PROJECT CONDITIONS: Placement of concrete reinforcing shall be coordinated with installation of concrete formwork, vapor barriers, concrete inserts, conduit and all other items occurring in the area.

PART 2 PRODUCTS

2.01 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.

2.02 WELDED STEEL WIRE FABRIC: Shall conform to ASTM A 185, new, free from rust and other coatings that will prevent bond.

2.03 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 and sides)	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. Do not weld reinforcing steel unless specifically approved by the Project Engineer.

END OF SECTION

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES: All cast-in-place concrete and other related items necessary to complete Project indicated by Contract Documents unless specifically excluded.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms and Accessories.

B. Section 03200 – Concrete Reinforcement.

C. Section 07260 – Vapor Retarders

1.03 SUBMITTALS: Submit concrete mix design, concrete compression test reports and product data and manufacturer's installation instructions for concrete curing compound.

1.04 TESTING LABORATORY SERVICES: The Owner will provide testing as specified in Section 01455.

1.05 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. Design mix is to be established to provide concrete of l0 percent higher strength than the specified job strength, and proposed mix is to be submitted to the Project Engineer for review and approval prior to use on the job. The use of an approved mix design from a previous MDOT Project that can be transferred to this Project is recommended. Laboratory cylinders are to be made according to ASTM C 192 and compression tests according to ASTM C 39, using representative materials. Control of mixes is to be maintained at the Ready-Mix Plant and on the job site. When the mix is approved, no change shall be made without the written consent of the Project Engineer.

C. The Owner will provide testing as specified in Section 01455 – Testing Laboratory Services. Cylinders, 2 specimens from each sample, are to be cast on the job in accordance with ASTM C 31. Specimens will be tested in accordance with ASTM C 39. One cylinder from each location will be tested at 7 days for information and the other at 28 days for acceptance. Owner is to make at lease one strength test for each 100 cubic yards, or fractions thereof, of concrete placed in any one day. Copies of all test reports shall be furnished as directed by the Project Engineer.

1.06 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 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

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 01455.

B. All concrete shall have 3000-psi minimum compressive strengths at 28 days, unless noted otherwise.

C. Maximum slump for normal weight concrete shall be 4 inches.

2.02 CONCRETE MATERIALS

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

B. Water: From city or community water supply.

C. Structural Concrete Aggregate: ASTM C-33 with maximum size of 3/4 inch.

D. Admixtures: Provide admixtures produced by established reputable manufacturers and use in compliance with manufacturer's printed directions. Do not use admixtures that have not been incorporated and tested in accepted mixes, unless otherwise authorized in writing by the Project Engineer. 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. Chemical Hardener (Sealer): Colorless aqueous solution containing a blend of magnesium fluosilicate and zinc fluosilicate combined with a wetting agent containing not less than 2 pounds of fluosilicates per gallon.

C. Curing Compound: Clear bond, manufactured by Guardian Chemical Co., Kure-N-Seal, manufactured by Sonneborn, Safe-Cure, manufactured by Dayton Superior Corp. or approved equal. Compound shall not interfere with bonding or floor finish.

D. 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, Master Builders; Sonnogrout, Sonneborn; Five Star Grout, U.S. Grout Company.

2.04 CONCRETE MIXES

A. The ready-mix concrete shall be mixed and delivered in accordance with requirements of ASTM C 94. Uniformly and accurately control proportions of material weight. Control mixes for concrete shall be "Class 1" conforming to ACI 301. Mix proportions shall be selected in accordance with ACI 211.1 “Recommended Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete”. Excessive slump deviations will be cause for rejection of the supplied mix. 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. 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. 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 PLACING CONCRETE

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: 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: 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.

E. Exterior sign base shall have a Class 2, Rubbed Finish as follows:

1. After removal of forms, the Class 1 finish shall be completed and the rubbing of concrete shall be started as soon as its condition will permit. Immediately before starting this work, the concrete shall be kept thoroughly saturated with water for at lease three hours.
2. Surfaces shall be rubbed with a medium course Carborundum stone using a small amount of mortar on its face. The mortar shall be composed of cement and sand mixed in the proportions used in the concrete being finished. Rubbing shall be continued until all form marks, projections, and irregularities have been removed, all voids filled, and a uniform surface has been obtained.
3. The final finish shall be obtained by rubbing with a fine Carborundum stone and water. This rubbing shall continue until the entire surface is a smooth texture and uniform color.

4. After the final rubbing is completed and the surface has dried, it shall be rubbed with burlap to remove loose powder and objectionable marks.

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. 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. 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 04200 MASONRY UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES: Brick masonry cavity wall work and brick veneer masonry work as shown on the Drawings and schedules.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: 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.

B. Job Mock-up: Prior to installation of masonry work, erect sample wall panel mock-up materials, bond and joint tooling shown or specified for final Work. Provide special features as directed for caulking and contiguous work. Build mock-up at the site, where directed, of full thickness and approximately 4 feet by 3 feet unless otherwise shown, indicating the proposed range of color, texture and workmanship to be expected in the completed Work. Obtain Project Engineer / MDOT Architect's acceptance of visual qualities of the mock-up before start of masonry work. Retain mock-up during construction as a standard for judging completed masonry work. Do not alter, move or destroy mock-up until Work is completed. Provide mock-up panel for each type of exposed unit masonry work.

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:

1. Boral Brick, Hattiesburg, Mississippi
2. Columbus Brick, Columbus, Mississippi
3. Old South Brick & Supply Company, Jackson, Mississippi
4. Tri-State Brick & Tile Company, Inc., Jackson, Mississippi

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 MASONRY UNITS: Obtain masonry units from one manufacturer, of uniform texture and color for each kind required, for each continuous area and visually related areas.

2.03 BRICK, GENERAL: Unless otherwise shown or specified, provide standard size brick (8 inches long x 2-l/4 inches high x 3-3/4 inches wide) 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. Use solid brick in locations where the cores in cored bricks are exposed to view.

A. Face Brick: Brick exposed to view ASTM C 2l6, Grade SW for exterior exposures.

B. 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.

2.04 CONCRETE MASONRY UNITS, GENERAL: Manufacturer's standard units with nominal face dimensions of l6 inches long by 8 inches high (l5-5/8 inches by 7-5/8 inches actual), unless otherwise shown. Provide special shapes where shown and where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions. Provide UL certified units where indicated.

A. Hollow Load-Bearing: Provide units complying with ASTM, C 90. Provide lightweight units using ASTM C 33l aggregate for a dry net weight of not more than l05 lbs. per cubic foot.

B. Classification: Curing shall comply with ASTM C 90, Type II, Nonmoisture-Controlled Units.

C. Exposed Face: Provide manufacturer's standard color and texture, unless otherwise indicated.

2.05 MORTAR MATERIALS: 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 be as selected by the Project Engineer / MDOT Architect from manufacturer's standard colors. Mortar color for building (common) brick shall be natural color or white cement as required to produce the required standard mortar color.

A. Portland Cement: ASTM C l50 Type I, except Type III may be used for cold weather protection.

B. Hydrated Lime: ASTM C 207, Type S.

C. Sand: ASTM C l44, except for joints less than l/4 inch, use aggregate graded with 70 to l00 percent passing the No. 16 sieve.

2.06 MASONRY ACCESSORIES

A. Brick Masonry Cavity Wall Work: Provide welded wire units prefabricated in straight lengths of not less than l0', with matching corner and tee units. Fabricate from Cold-drawn steel wire complying with ASTM A 82, with deformed continuous side rods and plain cross-rods, crimped for cavity wall construction (if any), and a unit width of 1-l/2 inches to 2 inches less than thickness of wall or partition. Provide units fabricated with single pair of 9 gage side rods and 9-gage perpendicular cross-rods spaced not more than l6 inches on center. For composite exterior walls with concrete masonry back up, fabricate units with additional side rod spaced for embed in inside face of back up wythe. All units 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. Brick Veneer Masonry Work: 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.

C. Anchoring Devices for Masonry: Provide straps, bars, bolts and rods fabricated from not less than l6 gage sheet metal or 3/8 inch diameter rod stock, unless otherwise indicated.

D. Concrete Inserts for Masonry:

1. Furnish dovetail shots with filler strips, where masonry abuts concrete. Fabricate from 24 gage galvanized steel unless otherwise indicated.
2. For installation of concrete inserts, see concrete sections of these Specifications. Advise concrete installer of specific requirements regarding his placement of inserts, which are to be used, by the masonry installer for anchoring of masonry Work.

E. Flashing for Brick Veneer Walls: Provide concealed flashing, shown to be built into masonry, as specified in Section 07650 - Flexible Flashing, unless otherwise indicated.

2.07 EMBEDDED MASONRY CAVITY WALL FLASHING

A. Through Wall Flashing: Manufacturer's standard product consisting of five-ounce copper coated with flexible asphalt or five-ounce copper reinforced with interlacing sisal fibers and asphalt bonded between two layers of heavy creped kraft paper. Use only where flashing is fully concealed in masonry.

B. Adhesives, Primers and Seam Tapes for Flashing: Flashing manufacturer's standard products or products recommended by the flashing manufacturer for bonding flashing sheets to each other and to substrate.

C. 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. AFCO Products, Inc., 44 Park St., Somerville, MA 02143. Tel: (617) 623-7700.
3. Fiberweb Div., Clark / Hammerbeam, Corp., P.O. Box 381, Dedham, MA 02027. Tel: (781) 461-1946.
4. York Manufacturing, Inc., P.O. Box 1009, Sanford, ME 04073. Tel: (800) 551-2828.

D. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.08 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 MDOT 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 01630-Product Options and Substitution Procedures.

PART 3 EXECUTION

3.01 INSPECTION: 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: Building masonry construction to the full thickness shown, except, build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness shown or specified.

A. Build chases and recesses as shown and as required for the work of other trades. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

B. Cut masonry units 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. Do not wet concrete masonry units.

E. 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.

F. Pattern Bond: Lay masonry work in a running bond unless indicated otherwise.

G. 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. Lay-up walls plumb and true and with courses level, accurately spaced and coordinated with other work.

H. Stopping and Resuming Work: Rack back l/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.

I. Built-in Work: As the work progresses, built-in items specified under this and other sections of these specifications. Fill in solidly with masonry around built-in items. Fill space between hollow metal frames and masonry solidly with mortar.

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-l/2 hours has elapsed since initial mixing. Re-temper mortar during 2-l/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. Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and foundation walls and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or to be filled with concrete or grout.

D. Joints: Maintain joints widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints. Cut joints flush for masonry walls that are to be concealed or to be covered by other materials. Tool exposed joints slightly concave. Rake out mortar in preparation for application of caulking or sealant where shown.

E. 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 CAVITY WALLS: Keep cavity clean of mortar droppings during construction. Strike joints facing cavity, flush.

A. Tie exterior wythe to back-up with continuous horizontal joint reinforcing embedded in mortar joints at not more then l6 inches on center vertically.

B. 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.

C. Place Weep Vents in head joints at exterior wythe of cavity wall located immediately above ledges 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 HORIZONTAL JOINT REINFORCING: Provide continuous horizontal joint reinforcing as shown and specified. Fully embed longitudinal side rods in mortar for their entire length with a minimum of cover of 5/8 inch on exterior side of walls and 1/2 inch at other locations. Lap reinforcement a minimum of 6 inches at ends of units. Do not bridge control and expansion joints with reinforcing except at wall openings. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend units as directed manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions. Space continuous horizontal reinforcing as follows:

A. For multi-wythe walls (solid or cavity) where continuous horizontal reinforcing also acts as structural bond or tie between wythes, space reinforcing as required by code but not less than l6 inches on center vertically.

B. For single-wythe walls, space reinforcing at l6 inches on center vertically, unless otherwise shown.

C. Reinforce masonry opening greater than 12 inches wide, with horizontal joint reinforcing placed in 2 horizontal joints approximately 8 inches apart, both immediately above the lintel and immediately below the sill. Extend reinforcing a minimum of 24 inches beyond jambs of the opening, bridging control joints where provided.

3.06 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:

1. Provide an open space not less than l/2 inch in width between masonry and structural member, unless otherwise shown. Keep open space free of mortar or other rigid materials.
2. 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.

3.07 LINTELS: Install loose lintels of steel and other materials where shown.

3.08 CONTROL AND EXPANSION JOINTS

A. Provide vertical expansion, control and isolation joints in masonry. Build-in related masonry accessory items as the masonry work progresses. Rake out mortar in preparation for application of caulking and sealants.

B. Control Joint Spacing: If locations of control joints are not shown, place vertical joints 25'-0" on center if not reinforced. Locate control joints at points of natural weakness in the masonry work.

3.09 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.

B. Install reglets and nailers for flashing and other related Work where shown to be built into masonry Work.

3.10 REPAIR, POINTING AND CLEANING: 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.

A. 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.

B. 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.

C. 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.

D. 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 05500 METAL FABRICATION

PART 1 GENERAL

1.01 SECTION INCLUDES: All miscellaneous metal work. The Work includes, but is not limited to, pipe railings, steel lintels, ornamental metalwork and miscellaneous framing & supports.

1.02 RELATED SECTIONS

A. Section 09050 – Color Design.

B. Section 09900 - Paints and Coatings: Painting for all ferrous metal exposed to view.

1.03 SUBMITTALS: Prepare and submit shop drawings for all work under this section. Indicate profiles, sizes, materials connection details, attachments, reinforcing, anchorage, size and type of fasteners, including every hole, and accessories. Include erection drawings, with plans, elevations, and details where applicable.

PART 2 PRODUCTS

2.01 MATERIALS: 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.

A. 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 or other defects. Castings shall be free of fins, burrs and slag.

B. 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.

C. 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.

D. 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.

E. 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.

F. 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 / MDOT Architect.

G. 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.

H. 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.

I. 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: 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.

2.03 PIPE RAILINGS: Fabricate railings and posts from 1-1/4 inch round tube steel, ASTM A 53, Type E or S, Grade A, Schedule 40. Shop prime after fabrication. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32-inch, unless otherwise shown.

A. Welded Connections: Cope intersections of rails and posts, weld joints and grind smooth. Butt weld end-to-end joints of railings or use welding connectors, at fabricator's option. At connections to steel supports, weld post directly to steel supports, unless otherwise indicated.

B. Anchorage: Use type of bracket with pre-drilled hole for exposed bolt anchorage. For stud partitions and framing use lag bolts set into wood backing between studs and framing members. Coordinate with stud installations for accurate location of backing members.

2.04 LOOSE LINTELS: 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.

2.05 ORNAMENTAL METALWORK: Provide ornamental metalwork in shapes and sizes as shown on Drawings. Treillage and ornamental panels shall be equal to Julius Blum and Company, P.O. Box 816, Callstadt, NJ 07072, Tel. (800) 526-6293; equal products are acceptable by Lawler Foundry Corp., Birmingham, AL, Tel. (205) 595-0596 or J. B. Braun Company, Morton Grove, IL, Tel. (847) 663-9300. Aluminum soffit vents shall be equal to Architectural Grille 77-14th Street, Brooklyn, NY 11215, Tel. (800) 387-6267; equal products are acceptable by Hi-Tech Metals, Inc., Maspeth, NY, Tel. (718) 894-1212 or Robinson Iron, Alexander City, AL, Tel. (256) 329-8486.

A. Treillage and Roof Railing Panels: Repair and replace units as required to match existing.

B. Reception Gate and Panels:
   1. Panel – 521
   2. Corner Bracket – 527
   3. Rosette – 526
   4. Rails – 1 inch by 1 inch tube

C. Soffit Vents and Panels: Majestic No. 225, aluminum with insect screen, size as indicated on Drawings. Finish shall be Tiger Drylac Powder Coating. Color as selected be the MDOT Architect to closely match soffit color.

2.06 MISCELLANEOUS FRAMING AND SUPPORTS: Provide miscellaneous steel framing and supports which are not a part of structural steel framework, as required to complete Work.

A. Fabricate miscellaneous units to sizes, shapes, and profiles indicated, or, if not indicated, of required dimensions to receive adjacent other work to be retained by framing. Except as otherwise indicated, fabricate from structural steel shapes, plates and steel bars of welded construction using mitered joints for field connection. Cut, drill and tap units to receive hardware and similar items.

B. Galvanize exterior miscellaneous frames and supports.

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.

B. 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.

C. Framing above soffit vents to be painted black.

3.02 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 05545 PRECAST UTILITY TRENCH SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES: Precast utility trench system with channel sections of polymer concrete, accessories, sealant, pipe hanging system at sidewalls and steel floor plates as shown and / or required for a complete system.

1.02 RELATED SECTIONS

A. Section 03100 – Concrete Forms & Accessories.

B. Section 03300 – Cast- in-Place Concrete.

C. Section 09050 – Color Design

D. Section 09900 – Paints and coatings

E. Section 15400 – Plumbing Basic Materials & Methods.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions.

B. Shop Drawings: Submit shop drawings indicating channel layout, outlet locations and depths, floor plates and accessories.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in precast utility trench systems with 10 years minimum experience and have continuing in-house quality control system to assure highest standards of quality.

B. Installer: Company with 3 years minimum experience, with a record of successful in-service performance, who is thoroughly familiar with manufacturer's installation requirements.

1.05 DELIVERY, STORAGE, AND HANDLING: Upon receipt of materials installer shall examine the shipment for damage and completeness. Perform in manner to preclude damage to components and surroundings.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by ABT, Inc., P.O. Box 837, Troutman, NC 28166 Tel. (704) 528-9806.

B. Equivalent products by the following manufacturers are acceptable:

1. ACO Polymer Products, Inc., P.O. Box 245, Chardon, OH 44024.Tel. (440) 285-7000.
2. Mea – Josam, P.O. Box T, Michigan City, IN 46361. Tel. (219) 872-5531.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures

2.02 COMPONENTS

A. Utility Channel: Precast channels fabricated of polyester polymer concrete, 16 inches wide, 7inches deep (clear) with interlocking tongue and groove connections at adjoining channels, having the following attributes:

1. Lengths: 39.2 inches.
2. Bottoms: smooth and level.
3. Anchoring ribs: full length.
4. Chemical resistance: Water, gasoline, hydraulic oil and road salts.

B. Floor Plates: Equal to ABT, Inc. Model No. IFP .375, 3/8-inch thick Inlay Steel Floor Plate Solid Cover (Black).

C. Accessories as follows:

1. End plates.
2. PolySeal 3, two-part vinyl ester, joint sealant.
3. Pipe hanging system at sidewalls as required.

PART 3 EXECUTION

3.01 EXAMINATION: 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. Assure that substrate is compacted per Division 2 requirements.

B. Roughen surface, and acetone wash, area to receive PolySeal 3 sealant.

3.03 INSTALLATION: Install units plumb and level, in locations as shown or described and in accordance with manufacturer's installation instructions. Assure that all joints in system are sealed to preclude leakage. Concrete to support and surround trench system shall be a minimum of 4 inches thick and have 3000-psi minimum compressive strengths at 28 days, unless noted otherwise.

3.04 PAINTING: Paint floor plates with non-slip abrasive coating as specified in Section 09900.

3.05 CLEANING AND PROTECTION: At completion of installation, clean surfaces in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 06100 ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES: 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 RELATED SECTIONS

A. Section 03100 - Concrete Forms and Accessories.

B. Section 06400 - Architectural Woodwork.

C. Section 08710 - Door Hardware.

1.03 COORDINATION: 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.

1.04 QUALITY CONTROL: 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.

1.05 DELIVERY, STORAGE AND PROTECTION: 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.

1.06 PROJECT CONDITIONS: 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: 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.

2.02 FRAMING LUMBER

A. Where wood framing is shown or scheduled, provide lumber complying with grading rules which conform to the requirements of the "National Grading Rule for Dimension Lumber" of the American Lumber Standards Committee established under PS 20.

B. For Light Framing: Standard Grade.

C. For Structural Framing: (6 inches and wider and from 2 inches to 4 inches thick), provide the following: No. 1 Grade; Douglas Fir (WCLB or WWPA), Southern Pine (SPIB). Fb (minimum extreme fiber stress in bending); 500 psi. E (minimum modulus of elasticity); 1,500,000 psi.

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:
   Southern Pine (SPIB) No. 2 boards of 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 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 C-D Plugged Grade, unless otherwise specified or shown on Drawings. Unless specifically stated otherwise, all exposed plywood shall be painted or stained from standard colors as selected by Project Architect.

D. Exterior Plywood: Exterior type, medium density, C Grade for concealed faces.

1. Roof sheathing: 3/4 - inch thick.
2. Wall sheathing: 1/2 - inch thick.

2.05 ANCHORAGE AND FASTENING MATERIALS: 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 HURRICACE CLIPS: Hurricane clips shall be equal to 18 gage galvanized steel framing anchor style number 1 as manufactured by Cleveland Steel Specialty Company.

2.07 TREATED WOOD: 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.

A. 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.

B. 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.

2.08 FELT: Refer to Section 07260 – Vapor Retarders for weather-resistive barrier on exterior face of wall sheathing.

PART 3 EXECUTION

3.01 INSTALLATION: 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.

A. 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.

B. 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.

B. Plywood Sheathing: Panel ends and edges shall have spacing of 1/8 inch, unless otherwise indicated by the panel manufacturer. Nail 6 inches on center along supported panel edges and 12 inches on center at intermediate supports with 6d common nails for panels 1/2 -inch thick and 8d nails for panels 3 /4 -inch thick.

3.03 WOOD GROUND NAILERS, BLOCKING, AND SLEEPERS: 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.

A. 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.

B. 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.

3.04 WOOD FURRING: Install plumb and level with closure strips at all edges and openings. Shim with wood as required.

A. Suspended Furring: Provide of size and spacing shown, complete including hangers and all attachment devices. Level to a tolerance of 1/8 inch in 12 feet.

3.05 WOOD FRAMING

A. Set wood framing accurately to required lines and levels. Provide framing members of sizes and on spacing shown, and frame openings as shown, or if not shown, comply with the recommendation of the "Manual for Housing Framing" of the National Forest Products Association. Cut, join, and tightly fit framing around other Work. Do not splice structural members between supports unless otherwise detailed.

B. Anchor and nail as shown, or if not shown, to comply with the "Recommended Nailing Schedule - Table 1 of the "Manual of House Framing" and other recommendations of the N.F.P.A.

C. Roof framing anchorage shall be by hurricane clips. Clips shall allow horizontal nailing into the top plates. Hurricane slip type truss anchors shall be provided at each corner and at every bearing point. Where an anchored member bears on an intermediate point, a truss anchor shall be installed at that bearing point.

END OF SECTION

SECTION 06400 ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.01 SECTION INCLUDES: Architectural woodwork as shown on the Drawings and schedules. 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. The types of architectural woodwork include, but are not limited to Standing and Running Trim, Cabinets with or for paint finish, Countertops, Shelving, and Miscellaneous work.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product data, specifications, and installation instructions for each item of Factory-fabricated woodwork prior to fabrication.

B. Shop Drawings: Submit Shop Drawings for Lumber, Panel Products, Standing and Running Trim, Cabinets, Countertops, Shelving, and miscellaneous work. Shop Drawings shall show location of elevations, large-scale details, attachment devices and other components.

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.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING: 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 PROJECT CONDITIONS: 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.

A. Conditioning: The Installer shall advise the Contractor of temperature and humidity requirements for woodwork installation areas. Do not install woodwork until the required temperature and relative humidity have been stabilized and will be maintained in installation areas.

B. Maintain temperature and humidity in installation area as required to maintain moisture content of installed woodwork within a 1.0 percent tolerance of the optimum moisture content, from the date of installation through the remainder of the construction period. The fabricator of the woodwork shall determine the optimum moisture content and required temperature and humidity conditions.

PART 2 PRODUCTS

2.01 BASIC MATERIALS AND FABRICATION METHODS: Except as otherwise indicated, comply with the following requirements for architectural woodwork not specifically indicated as pre- fabricated or pre-finished standard products.

A. 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.

B. Wood for Painted Finish: Comply with 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 Architect's prior approval.

C. Plastic Laminate: Comply with NEMA LD3; type, thickness, color, pattern and finish as indicated for each application.

D. Quality Standards: For the following types of architectural woodwork, comply with the indicated standards as applicable.

1. Lumber: AWI Section 100
2. Standing and running trim: AWI Section 300
3. Cabinets and Countertops: AWI Section 400, A, B, C
4. Shelving: AWI Section 600
5. Miscellaneous work: AWI Section 700

E. 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.

F. Pre-Cut Openings: Fabricate architectural woodwork with pre-cut openings, wherever possible, to receive hardware, appliances, plumbing fixtures, electrical work and similar items. Locate openings accurately and use templates or roughing-in diagrams for proper size and shape. Smooth the edges of cut outs and where located in countertops and similar exposures, seal the edges of cut outs with a water resistant coating.

G. 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.

2.02 ARCHITECTURAL WOODWORK TYPES

A. Wood cabinets: Custom Grade. On exposed portions provide solid wood and plywood (no plywood substitutes) meeting the requirements for the specified Quality Grade.

1. Exposed surfaces: Birch
2. Semi-Exposed surfaces: Birch
3. Concealed surfaces: Birch

B. Plastic Laminate Finished Casework: Grade: Premium, Plastic Laminate for Horizontal Surfaces: 0.050" thick, General Purpose Type (high pressure). Plastic Laminate for External Vertical Surfaces: 0.028" thick, General Purpose Type (high pressure).

C. Plastic Laminate Colors and Patterns: As selected by the Project Engineer / MDOT Architect from manufacturer's standard products, satin finish (5-34 reflectance).

D. Running and Standing Trim: Provide wood molding in profiles to match existing and as indicated on Drawings. Specie shall be Spanish cedar for exterior and poplar for interior.

E. Bead Board Ceiling: Provide 1 inch by 6 inch tongue and groove Southern Yellow Pine, No. 1 bead board with center bead as indicated on the Drawings.

F. Solid Surfacing: Provide solid surfacing equal to Surell as manufactured by the Formica Corporation, Corian as manufactured by EI Dupont De Nemours & Company, Inc. or Gibraltar as manufactured by Wilsonart International, Inc.

G. Stile and Rail Wood Doors: Provide Spanish cedar stile and rail wood doors to match existing at exterior and interior locations. (Refer to Section 08210 – Wood Doors).

H. Wood Shutters: Provide Custom Grade Spanish cedar shutters to match existing.

I. Wood Posts: Provide Spanish cedar wood posts for ornamental railing system at roof in configurations to match existing.

2.03 FINISH FOR ARCHITECTURAL WOODWORK: See Section 09900 PAINTS & COATINGS.

2.04 CABINET HARDWARE AND ACCESSORY MATERIALS: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for units that are specified as "door hardware" in other sections of these specifications. Except as otherwise indicated, comply with ANSI A156.9 "American National Standard for Cabinet Hardware." Unless shown or noted otherwise, cabinet hardware shall comply with the following: Hinges: Concealed type equal to Blum 125 Series using full side adjustment. Pulls: Wire type equal to Stanley 4484. Drawer guides equal to K&V 1300. Adjustable shelf hardware (side support) K&V 255-256. Adjustable shelf hardware (back support) K&V 87-187 for 16" deep shelves. Hardware finishes to be selected by MDOT Architect.

PART 3 EXECUTION

3.01 PREPARATION

A. Condition woodwork to average prevailing humidity conditions in installation areas prior to installing.

B. Deliver concrete inserts and similar 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: 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.

A. 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. Except where pre-finished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork, and matching final finish where transparent finish is indicated.

B. Casework: Install without distortion so that doors and drawers will fit openings properly and be accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

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.

D. Countertops: Anchor securely to base units and other support systems as indicated.

3.03 PREPARATION FOR SITE FINISHING: 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: 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.

A. Clean hardware, lubricate and make final adjustments for proper operation. Clean woodwork on exposed and semi-exposed surfaces. Touch up shop applied finishes to restore damaged or soiled areas.

B. Refer to Section 09900 for final finishing of installed painted and stained architectural woodwork.

C. 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 07545 THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES: Fully adhered roofing system utilizing a polyester reinforced, hot air welded thermoplastic KEE (Ketone Ethylene Ester) single ply membrane with a polyester felt backing, related accessories, miscellaneous flashing and attaching devices as indicated and / or required for a complete single ply roofing system.

1.02 RELATED SECTIONS: Refer to Section 06100 – Rough Carpentry for plywood deck and wood blocking.

1.03 SUBMITTALS

A. Prior to the start of any roofing work, the installer shall submit a list of materials he intends to furnish and installation specifications to be followed, along with the manufacturer's Project Approval Form. Any deviations from this specification or standard detail drawings shall also be submitted for review and approval.

B. Installer shall submit certification that the system proposed has been tested and has the minimum physical properties required. See Part 2 Products.

C. Before fabrication, delivery or installation of the Work, submit a letter of certification from the manufacturer accepting or approving the roofing installer who will perform work under this specification.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in single ply roofing Products with 10 years minimum experience.

B. Installer: Company specializing in installation of single ply roofing systems, with 5 years minimum experience, who has completed work similar to that indicated for this project and with a record of successful in-service performance. Submit identification of at least 3 projects of similar scope and complexity along with name, address, and telephone number of the Architect, Owner and General Contractor.

C. Upon completion, the roofing system shall be inspected by the manufacturer's Technical Representative to verify that the system has been installed according to specifications and details.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials with manufacturer's labels intact and legible.

B. Upon receipt of materials, installer shall examine the shipment for damage and completeness.

C. Store roofing insulation, membrane and all other moisture sensitive materials indoors, or on raised platforms covered with suitable waterproof protective covering. All sealants and adhesives shall be stored to maintain a minimum temperature of 45 degrees.

1.06 WARRANTY: Manufacturer shall provide a written warranty, covering weather tightness of the roofing system and agreeing to replace or repair defective materials and workmanship, for a period of 15 years from the date of Maintenance Release.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Flex Membrane International, Inc., Bethlehem Drive, Morgantown, PA 19543. Tel: (800) 969-0108.

B. Equivalent products by the following manufacturers are acceptable:

1. Ecology Roof Systems, Inc., Santa Ana, CA, Tel. (800) 553-3833.
2. MPV Enterprises, LLC., Saint Louis, MO, Tel. (877) 621-3384.
3. Seaman Corp, Fibertite Div., Wooster, OH, Tel. (800) 927-8578.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 MEMBRANE

A. Field and flashing membranes shall be equal to Flex's FB Elvaloy® adhered flexible sheet roofing system and have the following minimum physical properties:

PROPERTY	TEST PROCEDURE	PHYSICAL PROPERTIES
Color		White or Off White
Thickness	ASTM D751	0.045" Nominal
Breaking Strength	ASTM D751	235 lbs.
Elongation	ASTM D751	> 100%
Shore "A" Hardness	ASTM D2240	83
Heat Aging	ASTM D0573	90% of Original
Cold Resistance	ASTM D2136	-40 Degrees F
Water Vapor Permeability	ASTM E96	3,5g/m2/day
Wt. Change After Immersion	ASTM D570	1.5% Maximum
Seam Strength	ASTM D751	80% of Sheet
Dimensional Stability	ASTM D1240	0.5%
Accel. Weathering (Xenon Arc)	ASTM D2565	10M Hours (No Change)
Underwriters Laboratories		UL Class A
Factory Mutual		FM Class I-90

B. Membrane Sizes:

1. Full Width Sheets – 60 inches wide by 81 feet long or Custom Length.
2. MF Flashing – 30 inches wide by 60 feet long.
3. Trim Strips – 6 inches wide by 60 feet long.

2.03 ADHESIVE AND ACCESSORY MATERIALS

A. Flex Substrate Adhesive: Use to adhere field membrane to acceptable substrates. Approximate application rate for bonding the membranes are 1 1/2 to 2 gallons per roofing square.

B. Flex Accessories: Flex Membrane International, Inc.'s standard accessories shall be used to form a complete roofing system. Only those accessories that are supplied or otherwise approved by Flex are acceptable. Flex accessories include, but are not limited to, the following:

1. Fasteners
2. Plates
3. Termination Bars
4. Trim and Flashing
5. Flashing Adhesive
6. Coated Metal

7. Pre-Formed Flashings – boots for pipe penetrations, inside & outside corners
8. Pipe Banding
9. Caulk
10. Walkway Pads

2.04 INSULATION

A. General Requirements as follows:

1. Insulation shall be Factory Mutual Class 1, I-90 Approved.
2. Insulation shall meet applicable code requirements.
3. Insulation shall be approved by insulation manufacturer for use in fully adhered roofing installations of the nature specified herein.
4. Insulation shall be compatible with Flex Membrane and adhesive.
5. Insulation board size and thickness shall be as listed in the most current Factory Mutual Approval Guide.

B. Approved Insulation Type: Polyisocyanurate meeting the requirements of ASTM C1289, Standard Specification for Faced Rigid Cellular Polyiscocyanurate Thermal Insulation Board. Thickness shall be 1.5 inches.

C. Mechanical Attachment: Per manufacturer's recommendations using only Flex approved fasteners and plates.

2.05 UNDELAYMENT: Equal to G-P Gypsum Corp. 1/4" Dens-Deck Roof Board. Securely attach to roof deck per manufacturer's recommendations.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine wood trusses to ensure proper attachment to framing.

B. Inspect roof structure to verify deck is clean, dry and smooth with no excessive surface roughness, free of depressions, waves or projections, properly sloped to valleys or eaves.

C. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

D. Installer shall examine substrate and conditions under which Work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with installation until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION OF WOOD NAILERS AND BLOCKING: Install using methods recommended by manufacturer in accordance with local building code.

A. Nailers shall be anchored to resist a minimum force of 175 pounds per lineal foot in any direction. Fastener spacing shall be a maximum of 3 feet on center. Fasteners shall be installed within 6 inches of each end. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.

B. Thickness shall be as required to match substrate or insulation height, with a maximum allowable variance of plus or minus 1/4 inch.

3.03 INSTALLATION OF INSULATION

A. Accomplish installation of insulation and roofing so that area covered will be completely watertight by the end of each workday.

B. The insulation shall be laid out with its longest dimension perpendicular to the long membrane direction. All end joints shall be staggered with no gaps greater than 1/4 inch.

C. Insulation shall be neatly cut to fit snugly around penetrations and projections.

D. Insulation shall be mechanically attached to deck in accordance with manufacturer's recommendations.

3.04 INSTALLATION OF MEMBRANE

A. Flex FB Elvaloy® rolls shall be placed in the maximum length possible. Position sheets as indicated on approved shop drawings.

B. Lap joints shall be done by lapping 2-inch selvedge edge over the non-selvedge edge of the previous roll. Roll ends shall be butted and capped with Flex 6 inch wide Trim Strip.

C. When bonding the membrane to the Dens-Deck underlayment the field sheet shall be firmly broomed into the Flex Substrate Adhesive and then rolled with a heavy roller (minimum 200 pounds) to proper adhesion.

D. Joints shall be made by the method of the hot-air welding tool.

E. All joints shall be checked with a needle probe and voids repaired with the hot-air welding tool the same day they are made.

3.05 CLEANING: Clean exposed surfaces, removing substances that may cause corrosion of metal or deterioration of the membrane.

3.06 PROTECTION: Installer shall advise Contractor of required procedures for surveillance and protection of flashings, sheet metal work, membrane and accessories during construction, to ensure that Work will be without damage or deterioration until acceptance by the Owner.

END OF SECTION

SECTION 07610 SHEET METAL ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES: Factory formed, prefinished standing seam metal roof panels with concealed fasteners and related accessories, valleys, hips, ridges, eaves, corners, rakes, miscellaneous flashing and attaching devices as shown and / or required for a complete metal roofing system.

1.02 RELATED SECTIONS

A. Section 07620 – Sheet Metal Flashing & Trim.

B. Section 09050 – Color Design.

1.03 REFERENCES

A. ASTM A-525 General Requirements for Steel Sheet, Zinc-Coated (Galvanized).

B. ASTM A-653 Steel Sheet, Zinc-Coated (Galvanized) by Hot Dip Process, Structural Physical Quality.

C. ASTM E-1646: Static Water Infiltration.

D. ASTM E-1680: Static Air Infiltration.

E. Spec Data Sheet - Galvalume Sheet Metal by Bethlehem Corp.

F. SMACNA - Architectural Sheet Metal Manual.

G. UL 90 Rating: Wind Uplift Approval Conforming to Underwriters Lab. (UL) Section 580 Specifications.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each type of roofing material and accessory required.

B. SHOP Drawings: Submit detailed drawings showing layout of panels, anchoring details, joint details, trim, flashing, and accessories. Show details of weatherproofing terminations, and penetrations of metal work. Indicate material type, Thickness, finish and color.

C. Submit a two-foot by two-foot representative sample of each type of panel and accessory indicating panels, standing seams, closure, edge trim and flashing complete with factory finish and color if product is not one of those specified.

D. Submit results indicating compliance with minimum requirements of the Water Infiltration - ASTM E-1646 performance tests.

E. Submit sample copies of the Paint Finish Guarantee and Weather Tightness Warranty prior to installation for MDOT Architect's approval.

F. Submit materials and fasteners design to comply with wind uplift requirements of 2000 International Building Code.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in Architectural Sheet Metal Products with 10 years minimum experience.

B. Installer: Company specializing in Architectural Sheet Metal Products, with 5 years minimum experience, who has completed work similar to that indicated for this project and with a record of successful in-service performance. Submit identification of at least 3 projects of similar scope and complexity along with name, address, and telephone number of the Architect, Owner and General Contractor.

1.06 DELIVERY, STORAGE AND HANDLING: Upon receipt of panels and other materials, installer shall examine the shipment for damage and completeness. Panels should be stored on edge in a clean, dry place. One end shall be elevated to allow moisture to run off. Panels with strippable film must not be stored in the open exposed to the sun. Stack all materials to prevent damage and to allow for adequate ventilation.

1.07 WARRANTY

A. Paint Finish: Paint finish shall have a 20-year, non-prorated, guarantee against cracking, peeling and fade (Not to exceed 5 N.B.S. units).

B. Weather Tightness: The entire installation (clips, panels, fasteners, rakes, eaves, ridge/valley flashing conditions, roof to wall conditions as well as all materials specified as supplied by the manufacturer) shall be guaranteed weather tight for a minimum of 20 years. This warranty shall be identified as neither Non-Depreciating, Non-prorated nor have exclusions that identify valleys, curbs, and flashings. Provide written warranty, signed by metal roofing manufacturer and his authorized installer, agreeing to replace / repair defective materials and workmanship during the warranty period with no cost to the Owner.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Petersen Aluminum Corp., 1005 Tonne Road, Elk Grove Village, IL 60007. Tel: (800) 323-1960.

B. Equivalent products by the following manufacturers are acceptable:

1. Architectural Building Components, P.O. Box 52488, Houston, TX 77086. Tel: (800) 423-1105.
2. CENTRIA Roof Systems, 1005 Beaver Grade Road, Moon Township, PA 15108. Tel: (800) 759-7474.
3. Copper Sales, Inc., 1001 Lund Blvd., Anoka, MN 55303, Tel: (800) 426-7737.
4. Englert, Inc., 1200 Amboy Ave., Perth Amboy, NJ 08862 Tel: (732) 826-8614.
5. MBCI, 300 Highway 51 North, Hernando, MS 38632, Tel: (800) 206-6224.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 SHEET MATERIALS

A. Materials: Sheet Steel shall be PAC-CLAD 24 gage G-90 Galvanized ASTM A 653, or (24 gage prefinished Galvalume ASTM 792 Grade 50B with an AZ-50 coating).

B. Finish: Finish shall be full strength (70% PVDF) Kynar 500 Fluorocarbon coating applied by the manufacturer on a continuous coil coating line. Top side dry film thickness of 0.70 to 0.90 mil over 0.25 to 0.35 mil prime coat, to provide a total dry film thickness of 0.95 to 1.25 mil. Bottom side shall be coated with primer with a dry film thickness of 0.25 mil. Finish shall conform to all tests for adhesion, flexibility, and longevity as specified by the finish supplier.

C. Color: Shall be as indicated in Section 09050 for color selection. Color design selected from standard colors of Peterson Aluminum. Substituted systems, if submitted, shall match selected color.

D. Film: Strippable film shall be applied to the top side of the painted coil to protect the finish during fabrication, shipping and field handling. This strippable film shall be removed before installation.

2.03 ACCESSORY MATERIALS

A. Concealed fastening clips: G-90 Galvanized steel, spaced 18-inches on center, minimum, as required by design wind loads.

B. Fasteners: 1-inch # 10 pancake head wood screw with a # 2 Phillips head size. Minimum 2 fasteners per clip.

C. Sealant: Extruded vinyl weatherseal

D. Roofing Felt: 30-pound asphalt saturated un-perforated organic felt, complying with ASTM D226, Type 1.

E. Leak Barriers: Peel and Stick Membrane shall be installed at valley, ridge, hip and eave areas. Membrane shall be equal to Certainteed Wintergard, Grace Ice and Watershield, Henry Perma-Seal PE, Owen-Corning Deck-Dri, or Tamko Moisture Guard.

2.04 FABRICATION

A. Panels, 40 feet and less, shall be in one continuous length.

B. Panels fabricated by a portable roll former will require MDOT Architects prior approval.

C. All exposed adjacent flashing and accessories shall be of the same material and finish as the roof panels. All flashing, hem exposed edges on underside 1/2 inch. Fabricate in accordance with standard SMACNA procedures and details.

2.05 PREFORMED METAL ROOFING SYSTEM: Equal to Petersen Aluminum Corp. SNAP-CLAD panel system

A. System shall include, but is not limited to the following components:

1. Standing Seam Metal Roof Panels.
2. Preformed Metal Valley Flashing.
3. Preformed Metal Hip Flashing.
4. Preformed Metal Vented Ridge Cap.
5. Concealed fastening clips and fasteners.
6. Metal Fascia and Cladding.
7. Miscellaneous Metal Trim Necessary for a Complete System Installation.

B. SNAP-CLAD roof panels shall have 16 inches on center seam spacing, roll-formed in continuous lengths from eave to ridge, with a minimum standing seam height of 1-3/4 inches.

C. Certification shall be submitted, based on independent testing laboratory, indicating no measurable water penetration or air leakage through the system when tested in accordance with ASTM E-1646 and ASTM E-1680.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine wood trusses to ensure proper attachment to framing.

B. Inspect roof structure to verify deck is clean and smooth, free of depressions, waves or projections, properly sloped to valleys or eaves.

C. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

D. Installer shall examine substrate and conditions under which Work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with installation until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.02 INSTALLATION OF UNDERLAYMENTS: Install using methods recommended by manufacturer in accordance with local building code.

A. Eaves: Install Peel and Stick Membrane up the slope from eave edge a full 36 inches or 24 inches minimum beyond the interior “warm wall”; lap ends 6 inches and bond.

B. Valleys: Install Peel and Stick Membrane a minimum of 36 inches wide centered on valley; lap ends 6 inches minimum and seal.

C. Ridge / Hip: Install Peel and Stick Membrane a minimum of 36 inches wide centered on ridge / hip; lap ends 6 inches minimum and seal.

D. Roofing Felt: Install one layer of 30-lb. roofing felt lapped, staggered, and applied horizontally from eave to ridge over 3/4-inch thick plywood sheathing. Run sheets horizontally lapped so water sheds; nail in place. Lap horizontal edges 2 inches minimum and 2 inches minimum over Peel and Stick Membrane. Lap ends 4 inches minimum; stagger end laps of each layer 36 inches minimum. Lap underlayment over valley protection 6 inches minimum. Repair or replace any torn felt to maintain a continuous membrane ahead of installation of metal roofing.

E. Vent Pipes: At vent pipes, install a 24 inch minimum square piece of Peel and Stick Membrane lapping over roof deck underlayment; seal tightly to pipe.

F. Vertical Walls: At vertical walls, install leak barrier membrane extending 6 inches minimum up the wall and 12 inches minimum on to the roof surface lapping over roof deck underlayment.

G. Metal Drip Edge: At rake edges, install metal drip edge flashing over Peel and Stick Membrane and roof deck underlayment; set tight to rake boards; lap joints 2 inches minimum and seal with plastic cement; secure with nails.

3.03 INSTALLATION OF PANELS

A. Comply with Drawings, manufacturers instructions, and conform to standards set forth in the Architectural Sheet Metal Manual published by SMACNA, in order to achieve a watertight installation.

B. Install panels in such a manner that horizontal lines are true and level and vertical lines are plumb.

C. Install starter and edge trim before installing roof panels.

D. Remove protective strippable film prior to installation of roof panels.

E. Attach panels using manufacturer's standard clips and fasteners, spaced in accordance with approved shop drawings.

F. Install sealants for preformed roofing panels as specified on shop drawings.

G. Do not allow panels or trim to come into contact with dissimilar materials.

H. Do not allow traffic on completed roof. If required, provide cushioned walk boards.

I. Protect installed roof panels and trim from damage caused by adjacent construction until completion of installation.

J. Thoroughly clean and touch-up any areas scarred during installation with a touch-up paint approved by panel manufacturer. Only minor scratches and fastener heads shall be touched-up; any other damaged material shall be replaced.

3.04 CLEANING

A. Clean any grease, finger marks, or stains from the panels per manufacturer's recommendations.

B. Remove all scrap and construction debris from the site.

END OF SECTION

SECTION 07620 SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES: 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.

B. Gutters and downspouts.

1.02 RELATED SECTIONS:

A. Section 07610 – Sheet Metal Roofing

B. Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's product data, technical specifications, installation instructions and general recommendations for each specified sheet material and fabricated product for Project Architect's approval.

A. 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.

B. Shop Drawings: Submit shop drawings showing layout, joining, profiles, and anchorage of fabricated work, including major counter flashing and expansion joint systems, and roof accessories; layouts at l/4 inch scale, details at 3 inch scale.

C. QUALIFICATION DATA: Submit 2 copies for firms and persons that demonstrate capabilities and experience. Include a list with ten completed Project names and addresses, and name and addresses of Architects and Owners.

1.04 PROJECT CONDITIONS: Coordinate with interfacing and adjoining work for proper sequencing of each installation. Ensure best possible weather resistance and durability of the work and protection of materials and finishes.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer, with 5 years minimum experience, who has completed sheet metal work similar to that indicated for this project and with a record of successful in- service performance.

B. Mock-Up: Prior to installing, construct mock-up to demonstrate aesthetic effects as well as qualities of materials and execution.

PART 2 PRODUCTS

2.01 FLASHING AND SHEET METAL MATERIALS: Shall be 24 gage G-90 Galvanized Steel ASTM A 653 fabricated in accordance with SMACNA standards to sizes and profiles shown on the drawings. Pre-finished steel, colors as selected, Kynar 500 (70% PVDF), 20 year coating. Equal to Petersen Aluminum Corp., Tel. (800) 722-2523. Use galvanized finish where concealed from view only.

2.02 GUTTERS AND DOWNSPOUTS

A. Materials: Provide gutters and downspouts in shapes and sizes as indicated on the Drawings, fabricated from cold rolled 16 ounce copper sheet.

B. ACCESSORIES: Provide heavy duty fixed brass and adjustable copper strap hangers and supports.

C. Equivalent products by the following manufacturers are acceptable:

1. Atlanta Products, Inc., 5700 Riverview Industrial Drive, Mableton, GA 30059. Tel: (800) 554-1097.
2. Berger Bros. Co., 805 Pennsylvania Boulevard, Feasterville, PA 19053. Tel: (800) 523-8852.
3. Copper Craft, 4995 Keller Haslet Road, Keller, TX 76244. Tel: (800) 486-2723.

D. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 METAL FASCIAS

A. Materials: Provide fascia in profiles as indicated on the Drawings of same material and finish as metal roof.

B. Corners: Provide corner and end pieces with mitered, welded joints.

2.03 MISCELLANEOUS MATERIALS

A. Solder: Solder for use with steel or copper, provide 50 – 50 tin / lead solder ASTM B 32, with rosin flux.
B. Fasteners: Same metal as flashing / sheet metal or, other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

C. Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed; comply with FS TT-S-007, TT-S-00230, or TT-S-00l543.

D. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, non-corrosive, size and gage required for performance.

PART 3 EXECUTION

3.01 INSTALLATION REQUIREMENTS: Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible and set units true to line and level as indicated. Install work with laps, joints and seams which will be permanently watertight and weatherproof.

3.02 ACCESSORIES INSTALLATION

A. Comply with manufacturer's instructions and recommendations. Coordinate with installation of roof deck and other substrates to receive accessory units, and with vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the work performs properly, and that combined elements are waterproof and weathertight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures. Gutter supports shall be spaced at 30 inches on center, constructed of same material as gutters. Downspout straps shall be spaced 6 feet on center maximum (minimum of 3 required per downspout) and be same material as downspout.

B. Separate metal from incompatible metal or corrosive substrates by coating concealed surfaces with asphalt mastic as recommended by manufacturer.

3.03 FLASHINGS FOR MASONRY: Install in accordance with installation specifications in Division 4 sections and with manufacturers instructions with applicable materials approved by the manufacturer for the specific installation shown.

3.04 CLEANING AND PROTECTION: Clean exposed metal surfaces, removing substances, which might cause corrosion of metal or deterioration of finishes.

A. 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.

B. Flashings and sheet metal with any cuts, abrasions, or imperfections will not be acceptable and is to be replaced.

END OF SECTION

SECTION 07700 ROOF SPECIALTIES AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof hatches (scuttle)

B. Roof hatch ladder

C. Pre-fabricated skylights

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data, installation instructions and recommendations for products specified.

B. Shop Drawings: Submit shop drawings showing layout, joining, profiles and anchorage as it pertains to this project; layouts at 1/4 inch scale, details at 3 inch scale.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Roof hatch is based on products manufactured by The Bilco Company, P.O. Box 1203, New Haven, CT 06505. Tel. (230) 934-6363. Equal products are acceptable by O'Keeffe's, Inc., San Francisco, CA, Tel. (415) 822-4222 or Precision Ladders, LLC, Morristown, TN, Tel. (800) 225-7814.

B. Roof hatch ladder is based on products manufactured by Precision Ladders, LLC, 5727 Superior Drive, Morristown, TN 37814, Tel. (800) 225-7814. Equal products are acceptable by American Metal Works, Inc., Brandon, MS, Tel. (601) 825-7787 or O'Keeffe's, Inc., San Francisco, CA, Tel. (415) 822-4222.

C. Skylights are based on products manufactured by Naturalite Skylight Systems, P.O. Box 629, Terrell, TX 75160, Tel. (800) 527-4018. Equal products are acceptable by Conspec Systems, Inc., Cranford, NJ, Tel. (908) 272-5200 or O'Keeffe's, Inc., San Francisco, CA. Tel. (415) 822-4222.

D. Equal products by other manufacturers subject to compliance with specified requirements and Section 01630 - Product Options and Substitution Procedures.

2.02 ROOF HATCH (SCUTTLE): Furnish a complete roof scuttle unit, in a galvanized paint bond finish, where indicated equal to The Bilco Company Model S-20, 36 inches by 30 inches.

2.03 ROOF HATCH LADDER: Furnish a complete ladder unit, with galvanized finish, where indicated equal to Precision Ladders, LLC Model FL.

2.04 SKYLIGHTS: Furnish complete skylight units, with 9-inch high, insulated self-flashing curbs with .024 aluminum cladding, clear acrylic double domes and continuous condensate gutter equal to Naturalite Skylight Systems Models as follows:

1. Model as required to fit existing opening.

PART 3 EXECUTION

3.01 INSTALLATION

A. Except as otherwise indicated, comply with manufacturer's installation instructions and recommendations, and with SMACNA " American Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible and set units true to line and level as indicated. Install Work with laps, joints and seams that will be permanently weathertight and waterproof.

B. Coordinate with installation of roof deck and other substrates to receive accessory units. And with vapor barriers, roof insulation, roofing and flashing; as required to ensure that each element of the Work performs properly, and that combined elements are weathertight and waterproof. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses as well as inward and outward loading pressures.

C. Test operate units with operable components. Clean and lubricate joints and hardware. Adjust for proper operation.

3.03 CLEANING: Clean exposed surfaces, removing substances that may cause corrosion of metal or deterioration of finishes.

3.04 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 until acceptance by the Owner.

END OF SECTION

SECTION 07840 FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES: 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: 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: 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.

A. FIRE AND SMOKE PARTITIONS AND RELATED ASSEMBLIES: 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: 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.

1.05 WORKMANSHIP: 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., P.O. Box 21148, Tulsa, OK 74121, Tel. (800) 879-8000.
2. International Protective Coatings Corp, 1330 Industry Road, Hatfield, PA 19440, Tel. (800) 334-8796.
3. 3M Fire Protection Products, P.O. Box 33225, Saint Paul, MN 55144, Tel. (800) 328-1687.
4. United States Gypsum Company, 125 S. Franklin Street, Chicago, IL 60606, Tel. (880) 874-4968.

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 SEALANT: Equal to Hilti, Inc. FS-One.

2.03 CAULKING AND PUTTY: Equal to 3M Brand Fire Barrier CP- 25 Caulk and Putty 303.

2.04 PENETRATION SEALANTS: Equal to 3M Fire Barrier Penetration Sealing Systems 7902 and 7904 series as required.

2.05 INSULATION: Equal to United States Gypsum Company “Therafiber” Safing Insulation, 4 pcf density, unfaced.

2.06 INTUMESCENT FIRESTOPPING: Equal to Hilti, Inc. FS-One, CP 642 and FS 657 Fire Block as required.

2.07 ACCESSORIES: 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 Architect unless Manufacturer’s Standards closely matches finish of penetrated surfaces.

PART 3 EXECUTION

3.01 INSTALLATION: Installation of firestopping materials for small openings, cracks, crevices, and penetrations shall be in accordance with manufacturer's printed instructions.

A. Verify application required and location for each type of firestopping to be used and conform to manufacturer's exact instructions for specific applications.

B. 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.

C. Install fireproof sealant at all penetrations through rated walls and floors and at top and bottom on each side of rated walls.

D. Install approved metal sleeves with fireproof sealant at all communication and control wiring passing through rated walls throughout the entire project.

E. Install firestopping at fire and smoke walls and floors where construction passes through those areas.

END OF SECTION

SECTION 07920 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 07840-Firestopping).
4. Joints in walks.
5. 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 RELATED SECTIONS: Section 01330 – Submittal Procedures and Section 09050 – Color Design.

1.03 DEFINITIONS: 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.

1.04 WORK OF OTHER SECTIONS: Caulking and sealing may be performed as Work of other Sections when specified. However, all Work shall conform to the requirements of this Section.

1.05 SUBMITTALS: Submit manufacturer's product data and installation instructions for each type of sealant required. Product data shall include chemical characteristics, limitations, and color availability.

1.06 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.

1.07 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, P.O. Box 994, Midland, MI 48686. Tel: (800) 322-8723
2. GE Silicones, Hudson River Rd. Building 25-73, Waterford, NY 12188. Tel: (518) 233-2639.
3. Sonneborn Building Products, 889 Valley Park Drive, Shakopee, MN 55379. Tel: (800) 433-9517.
4. Tremco, Inc., 3735 Green Road, Beachwood, OH 44122. Tel: (800) 562-2728.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

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 sealing nonporous interior surfaces where conditions of high humidity and temperature extremes exist, including at and in conjunction with toilet fixtures, counters, vanities, thresholds and joints in tile finishes: Pecora 898 (Silicone Sanitary Sealant).

C. Type 3: Use for horizontal floor joints: Pecora Urexpan NR-200 (two-part, self-leveling, traffic-bearing, polyurethane sealant).

D. Type 4: Use for exterior sealing at door, louver, and window frames at masonry, and other materials: Pecora 864 (one-part Architectural Silicone Sealant). Color(s) to be selected by the MDOT Architect from manufacturer's full range of standard Architectural colors plus 32 special Color-Flex Designer 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: 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.

3.05 CURE AND PROTECTION: 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. 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 08210 WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extent and location of each type of wood door is shown on the Drawings and in Schedules.

B. Types of doors required include solid stile and rail wood.

1.02 RELATED SECTIONS

A. Section 08800 – Glazing.

B. Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Indicate door core material and construction; veneer species, type and characteristics.

B. Shop drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, identify cutouts for glazing and installation instructions. Indicate by transmittal form that copy of each instruction has been transmitted to the installer

1.04 QUALITY ASSURANCE: Comply with the requirements of the following standards unless otherwise indicated.

A. Non-Fire Rated Wood Doors: NWMA Industry Standard I, S, 1 "Wood Flush Doors" of the National Woodwork Manufacturer's Association.

B. Fire-Rated Wood Doors: Where fire-resistance classifications are shown or scheduled for wood door assemblies, provide doors which comply with requirements of NFPA No. 80 "Standard for Fire Doors and Windows" and which have been tested and rated with single point hardware by UL. Provide UL Label on each door and panel.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING: Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with the "On-Site Care" recommendations of NWMA pamphlet "Care and Finishing of Wood Doors" and with manufacturer's instructions.

1.06 WARRANTY: Manufacturer to provide a written warranty covering the life of the installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. Easley & Easley Millwork, Inc., P.O. Box 8577, Jackson, MS 39284. Tel. (601) 372-8881.

2. Scanlon -Taylor Millwork Company, P.O. Box 5029, Jackson, MS 39296. Tel. (601) 362-5333.
3. Southeastern Constructors, Inc., P.O. Box 1747, Brandon, MS 39043. Tel. (601) 825-9791.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 MATERIALS AND COMPONENTS: Provide wood doors complying with the applicable requirements of NEMA I. S. 1 for the kinds and types of doors indicated and as further specified. Provide manufacturer's standard 2 ply face panels, unless otherwise specified. Provide the same exposed surface material on both faces of each door, unless otherwise indicated.

2.03 GENERAL FABRICATION REQUIREMENTS

A. Wood Doors: Cut and trim openings through doors and panels. Comply with applicable requirements of referenced standards.

B. Light Openings: Factory cut openings. Trim openings for non-fire rated doors with solid wood moldings of profile shown.

2.04 STILE AND RAIL WOOD DOORS:

A. Fabricate wood doors in accordance with AWI Quality Standards, Section 1400.

B. Doors shall be AWI Premium Grade.

C. Wood specie shall be Custom Grade Spanish cedar.

D. Finishes: Provide finish complying with manufacturer's applicable standard finish specifications. Refer to Section 09900 – Paints and Coatings.

E. Transom and Side Panels: Where transom panels or side panels of wood are shown in same framing systems as wood doors, provide panels that match quality and appearance of associated wood doors, unless otherwise indicated. Fabricate matching panels with same construction, exposed surfaces and finish as specified for associated doors.

2.05 PREFITTING AND PREPARATION FOR HARDWARE: Comply with tolerance requirements of NWMA for pre-fitting. Machine doors for hardware requiring cutting of doors. Comply with final hardware schedules and doorframe approved Shop Drawings and with hardware templates and other essential information required ensuring proper fit of doors and hardware. Take accurate field measurements of hardware mortises in frames to verify dimensions and alignment before proceeding with machining.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine doorframes and verify that frames are correct type and have been installed for proper hanging of corresponding doors. Installer shall notify Contractor in writing of conditions detrimental to proper and timely installation of wood doors; do not proceed with installation until unsatisfactory conditions have been corrected. Install fire-rated doors in corresponding fire-rated frames in accordance with the requirements of NFPA No. 80.

3.02 PREPARATION: Condition doors to average prevailing humidity in installation area prior to hanging.

3.03 INSTALLATION

A. Install wood doors in accordance with manufacturer's instructions and approved Shop Drawings. Fit doors to frame for proper fit and uniform clearance at each edge and machine for hardware. Seal cut surfaces after fitting and machining. Bevel non-fire rated doors 1/8 inch in 2 inches at lock and hinge edges. Bevel fire rated doors 1/16 inch in 2 inches at lock edge.

B. Door Clearances: Fit to frames and machine for hardware for proper fit and uniform clearance at each edge.

1. For non-fire rated doors, provide following clearances:

a. 1/8 inch at jambs and heads.
b. 1/8 inch at meeting stiles for pairs of doors.
c. 1/2 inch from bottom of door to top of decorative floor finish or covering, except where threshold is shown or scheduled provide 1/4 inch clearance from bottom of door to top of threshold.

2. For fire-rated doors, provide clearances complying with limitations of authority having jurisdiction.

C. Job Site Finished Doors: Requirements for finishing wood doors are in Section 09900 PAINTS AND COATINGS.

3.04 ADJUSTING AND CLEANING: Re-hang or replace doors that do not swing or operate freely. Refinish or replace doors damaged during installation.

3.05 PROTECTION OF COMPLETED WORK

A. Installer shall advise Contractor of proper procedures required for protection of installed wood doors from damage or deterioration until acceptance of the Work.

B. Doors damaged before acceptance of the Work shall be repaired or replaced.

END OF SECTION

SECTION 08235 AMP COLONIAL DOORS, PANELS AND FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. The extent and location of each type of AMP Colonial door is shown on the Drawings and Schedules.

B. The following types of doors and frames are required:

1. AMP Colonial Doors
3. AMP Panels

1.02 RELATED SECTIONS

A. Section 07920 – Joint Sealants

B. Section 08710 – Door Hardware

C. Section 08800 – Glazing

D. Section 09050 – Color Design

1.03 SYSTEM PERFORMANCE

A. Provide door assemblies that have been designed and fabricated to comply with requirements for system performance characteristics listed below, as demonstrated by testing manufacturer's corresponding standard system according to test methods designated.

B. Thermal Transmission (exterior doors): "U" value of not more than 0.09 (BTU/Hr. x SF x degrees F) in accordance with AAMA 1503.01.

C. Additional Criteria: Provide AMP doors and panels with the following performance:

1. ASTM D 256 - nominal value OF 20.0
2. ASTM D 570 - nominal value of 0.20 to 0.40 percent
3. ASTM D 2583 - nominal value of 50

D. Abrasion Resistance: White face sheet to have no greater than 0.018 percent average weight loss percentage after Taber Abrasive Test – 25 cycles at 250 gram weight with H – 18 wheel. Similar results for other colors.

E. Stain Resistance: White face sheet to be unaffected by tea, ketchup or brown shoe polish after test procedure 8129 with MacBeth Colorimeter. Similar results for other colors.

H. Chemical Resistance: Face sheet to be unaffected after 4 hours exposure to 5.25 percent sodium hypochlorite. No discoloration will be allowed.

1.04 SUBMITTALS

A. Product Data: Submit Manufacturer's product data, specifications and instructions for each type of door and frame required in accordance with Section 01330 and the following:

1. Include details of core, stile and rail construction, and trim for lites and all other components.
2. Include details of finish hardware mounting.
3. Include samples of each aluminum alloy to be used on this project. Where normal finish color and texture variations are expected, include two or more samples to show the range of such variations.
4. Include sample warranty and one sample of typical fabricated section, showing joints, fastenings, quality of workmanship, hardware and accessory items before fabrication proceeds.

B. Shop Drawings: Submit shop drawings for the fabrication and installation of the doors and frames and associated components. Details to be shown full-scale, include glazing details and finish hardware schedule. Include elevations of each type door and frame.

1.05 QUALITY ASSURANCE

A. Standards: Comply with requirements and recommendations in applicable specification and standards by AAMA, except to the extent more stringent requirements are indicated.

B. Performance: Ten years minimum record of production of frames, doors and panels and completion of similar projects in type and size.

C. Instruction: The manufacturer or his representative will be available for consultation, including instruction to installation personnel.

D. Field Measurement: Field verify information prior to fabrication and furnishing of materials.

E. Regulation and Codes: Comply with current edition in force at project location of local, state and federal codes and regulations, including Americans with Disabilities Act of 1992.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials to job site in their original unopened package with labels intact. Inspect materials for damage and advise manufacturer immediately of any unsatisfactory materials.

B. Package door assemblies in individual corrugated cartons so no portion of the door has contact with the outer shell of the container. Package and ship frames pre-assembled to the greatest possible extend.

1.07 PRODUCT WARRANTY

A. Provide a written warranty signed by manufacturer, installer and contractor, agreeing to replace any doors, frames or factory hardware installation that fails in materials or workmanship, within the warranty period.

B. Failure of materials or workmanship includes: excessive deflection, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware installation.

C. The minimum time period of warranty is 10 years from acceptance.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on model SL-18 with SpecLite3 as manufactured by Special-Lite, Inc., P.O. Box 6, Decatur, MI 49045. Tel. (616) 423-7068. Local Supplier is Glen Lewis with Thrasher Architectural Products, Inc. Tel. (601) 981-9611.

B. Equivalent products by the following manufacturers are acceptable:

1. Fibertec Window & Door Manufacturing, 157 Rivermede Road, Unit 2, Concord, Ontario, Canada L4K 3M4. Tel. (888) 232-4956.
2. Vistawall Architectural Products, P.O. Box 629, Terrell, TX 75160. Tel. (215) 953-1260

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 MATERIALS AND ACCESSORIES

A. Aluminum Members: Alloy and temper as recommended by manufacturer for strength, corrosion resistant and application of required finish and control of color; ASTM B 221 for extrusions, ASTM B 209 for sheet/plate with aluminum wall thickness of 0.125 inch.

B. Components: Furnish door and frame components including transom panel supports from the same manufacturer. “Splitting” of door and frame components is not permitted.

C. Fasteners: Aluminum, non-magnetic stainless steel or other non-corrosive metal fasteners, guaranteed by the manufacturer to be compatible with the doors, frames, stops, panels, hardware, finish matching the item to be fastened.

D. Glazing gaskets: For glazing factory-installed glass and for gaskets which are factory-installed in “captive” assembly of glazing stops, manufacturer’s standard stripping of molded neoprene, complying with ASTM D 2000 (designation 2BC415 to 3BC620), or molded PVC complying with ASTM C 509 Grade 4.

2.03 FABRICATION

A. Sizes and Profiles: The required sizes for door and frame units, and profile requirements are shown on the Drawings.

B. Coordination of Fabrication: Field measure before fabrication, and show recorded measurements on final shop drawing.

C. Complete the cutting, fitting, forming, drilling and grinding of all metal work prior to assembly. Remove burrs from cut edges, and ease edges and corners to a radius of approximately 1/64-inch.

D. No welding of doors or frames is acceptable.

E. Maintain continuity of line and accurate relation of planes and angles. Secure attachments and support of mechanical joints, with hairline fit at contacting members.

2.04 ACRYLIC MODIFIED POLYESTER AMP COLONIAL DOORS

A. Materials and Construction as follows:

1. Construct 1-3/4 inch thickness doors of 6063-T5-aluminum alloy stiles and rails minimum 2-5/16 inches depth. Construct with mitered corners and provide joinery of 3/8-inch diameter full width tie rods through extruded splines top and bottom as standard. 0.125 inch tubular shaped stiles and rails reinforced to accept hardware as specified. Provide hex type aircraft nuts for joinery without welds, glues or other methods for securing internal door extrusions. Furnish integral reglets to accept face sheet to permit a flush appearance. Rail caps or other face sheet capture methods are not acceptable.
2. Extrude top and bottom rail legs for interlocking continuous rigidity weather bar. Lock face sheet material in place with extruded interlocking edges to be flush with aluminum stiles and rails.
3. Door Face Sheeting 0.120-inch thickness acrylic modified polyester. SL-18 doors with red oak wood grain pattern in a custom color as selected by the Project Architect.
4. Core of Door Assembly: Minimum five pounds per cubic foot density poured-in-place polyurethane free of CFC. Minimum “R” value of 11. Meeting stiles on pairs of doors and bottom weather bars with nylon brush weather-stripping.
5. Manufacture doors with cutouts for vision lites, louvers or panels as scheduled. Factory furnish and install all glass, louvers and panels prior to shipment.
6. Pre-machine doors in accordance with templates from the specified hardware manufacturers and approved hardware schedule. Factory install hardware.

2.05 ARCHITECTURAL PANELS: AMP Panels

1. Model SL-38, same thickness as door.
2. AMP face sheets with same color as door.

2.06 ALUMINUM FRAMING SYSTEMS

A. Tubular Framing as follows:

1. Framing systems from the door manufacturer of the size and type shown. 0.125 inch minimum wall thickness and type 6063-T5-aluminum alloy. 0.625-inch high, applied doorstops complete with screws and weatherstripping. Frame members are to be box type with four enclosed sides. Open back framing will not be acceptable.
2. Caulk joints before assembling frame members. Secure joints with fasteners and provide a hairline butt joint appearance. Profit doors to frame assembly and factory prior to shipment. Field fabrication of framing using “stick” material is not acceptable.
3. Applied stops for side, transom and borrowed lites and panels, with fasteners exposed on interior or unsecured portion only. Pre-machine and reinforce frame members for hardware in accordance with manufacturer’s standards and the approved hardware schedule. Factory install hardware.
4. Install with anchors appropriate for wall conditions to anchor framing to wall materials. A minimum of five anchors up to 7’-4” on jamb members, and one additional anchor for each foot over 7’-4”. Securely fasten head and sill members of transom, sidelights, and similar conditions.

B. Insert Framing Systems as follows:

1. Model: SL-1031, SL-1032 OR SL-1034.
2. Insert frame as shown using an integral stop fitted with weatherstripping.
3. Corner joints of miter design, secure with furnished aluminum clips, and screw into place.
4. Reinforce and pre-machine insert frame members for hardware in accordance with manufacturer's standards and the approved hardware schedule.
5. Anchors of suitable type to fasten insert framing to existing frame materials, using a minimum of five anchors on jambs up to 7'-4" height, three on headers. One additional anchor for each additional lineal foot of frame.

C. Frame Capping

1. Model SL-70
2. 0.093- inch wall thickness capping as indicated on drawings with insert from as shown. Finish of capping to match framing.

2.07 GLAZING

A. Design system for replacement of glass

1. Manufacturer's standard flush glazing system of recessed channels and captive glazing gaskets or applied stops as shown.
2. Allow for thermal expansion on exterior units.
3. Glass as shown and factory glazed into doors.

2.08 ALUMINUM FINISHES: Painted finish that matches panel color.

PART 3 EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's recommendations and Specifications for the installation of the doors, transoms and frames. Factory install hardware and glass in doors. Factory-assemble side-panels with hardware to the greatest extent possible.

B. Set units plumb, level and true to line, without warp or rack of doors or frames. Anchor securely in place. Separate aluminum and other metal surfaces with bituminous coatings or other means as approved by MDOT Architect.

C. Set thresholds in a bed of mastic and backseal.

D. Clean surfaces promptly after installation of doors and frames, exercising care to avoid damage to the protective coatings.

E. Ensure that the doors and frames will be without damage or deterioration (other than normal weathering) at the time of acceptance.

F. Provide Owner with all adjustment tools and instruction sheets. Arrange an in service session to Owner at owner's convenience. Any workmanship that is defective or deficient shall be replaced.

END OF SECTION*

SECTION 08334 ROLLING COUNTER DOORS

PART 1 GENERAL

1.01 SUMMARY: The extent of rolling counter doors is shown on the Drawings. Provide complete operating door assemblies including door curtains, guides, and counterbalance mechanism, hardware, operators and installation accessories.

1.02 RELATED SECTIONS: Section 09050 - Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and installation instructions. Include operating instructions and maintenance information with data for shaft and gearing, lubrication frequency, control adjustment, spare part sources. Include both published data and any specific data prepared for this project.

B. Shop Drawings: Submit shop drawings for approval prior to fabrication. Include detailed plans, elevations, and details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent materials.

1.04 QUALITY ASSURANCE

A. Furnish each door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components.

B. Insert and Anchorage: Furnish inserts and anchoring devices that must be set into walls for the installation of the rolling counter door units. Provide setting drawings, templates, instructions and directions for installation of anchorage devices.

1.05 DELIVERY, STORAGE, AND HANDLING: Deliver materials and products in labeled protective packages. Store and handle in strict compliance with manufacturers' instructions and recommendations. Protect from damage from weather, excessive temperatures and construction operations.

1.06 WARRANTY: Warranty of door and all components to be free from defects in labor and materials for a period of one year from the date of Final Acceptance.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Raynor Garage Doors, P.O. Box 448, Dixon, IL 61021. Tel. (800) 472-9667.

B. Equivalent products by the following manufacturers are acceptable:

1. Overhead Door Corp., 6750 LBJ Freeway, Suite 1200, Dallas, TX 75240. Tel. (800) 887-3667.
2. Windsor Door, 5800 Scott Hamilton Drive, Little Rock, AR 72209. Tel. (800) 946-3767.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures

2.02 ROLLING COUNTER DOOR: Equal to Durashutter “Select” Counter Doors by Raynor Garage Doors.

2.03 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Curtain: Interlocking, flat faced, extruded aluminum (6063-T5) slats .05 inch thick.

B. Finish: Aluminum with bronzed anodized finish.

C. Bottom Bar: Aluminum tubular extrusion with vinyl bottom astragal.

D. Guides: Extruded aluminum (6063-T5) with wool pile inserts on both sides, and with removable bellmouth curtain stops.

E. Brackets: 10 gauge galvanized steel with flanged mounting surface for hood attachment. Inside surface shall be flush with guide groove. Drive side bracket shall be fitted with a sealed ball bearing for continued performance.

F. Barrel: Structural steel pipe, minimum 4 1/2 inches O.D. by .120 inch wall thickness and designed to limit maximum deflection under load, to .03 inch per foot of span.

G. Hood & Side Covers: .04 inch thick aluminum. Hood shall have rolled edges to provide rigidity.

H. Wall Mounting Condition: Between Jambs mounting.

I. Locking: Slide bolt to engage guide with provision for padlock.

2.04 TUBE MOTOR OPERATOR: Model ‘TM’ – to be 115 volts, single phase, 60HZ, U.L. recognized and CSA approved. Planetary gear system with the capacity of manual override. Mechanical internal worm gear limits.

A. Operator Controls: Flush mounted key switch. Cycle time – 3 minutes ‘on’, 20 minutes ‘off’. Minimum temperature of – 10 degrees Fahrenheit. Operator is mounted inside of the barrel.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall take field dimensions and examine conditions of substrates, supports, and other conditions under which this Work is to be performed 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 door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports in accordance with final shop drawings, manufacturer's instructions, and as specified herein.

B. Instruct Owners personnel in proper operating procedures and maintenance.

3.03 ADJUSTING AND CLEANING

A. Upon completion of installation including work by other trades, lubricate, test and adjust doors to operate easily, free from warp, twist, binding or distortion.

B. Touch-up damaged finishes and repair minor damage. Clean exposed surfaces using non-abrasive materials and methods recommended by manufacturer of material or products being cleaned.

END OF SECTION

SECTION 08550 WOOD WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES: Extent of wood windows is shown on Drawings and in Schedules. Types of wood windows required include exterior double hung window units located in the Guard House.

1.02 RELATED SECTIONS

A. Section 08800 – Glazing for glazing requirements of wood windows, including windows specified herein shall be factory pre-glazed.

B. Section 09050 – Color Design.

C. Section 09900 – Paints and Coatings

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's specifications, standard details, and installation recommendations for components of wood window units required for project, including data that products that have been tested comply with performances requirements.

B. Shop Drawings: Submit Shop Drawings for fabrication and installation of wood windows, including elevations, detail sections of typical composite members, anchorage, reinforcement, expansion provisions, and glazing.

1.04 QUALITY ASSURANCE: Comply with applicable provisions of AAMA/NWWDA 101/I.S. 2-97, Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood windows and Glass Doors.

A. Manufacturer: Provide wood window units and framing system produced by a single firm with minimum 5 years successful experience in fabricating types required for this Project.

B. Performance and Testing: Fabricate components from manufacturer's stock systems which have been designed to comply with AAMA/NWWDA 101/I.S. 2-97, DP20.

C. Wind Loading: Fabricate exterior components from manufacturer's stock systems, which have been tested in accordance with ASTM E 330.

D. Weather Resistance: Fabricate exterior framing components from manufacturer's stock systems which have been tested to demonstrate permanent resistance to leakages as follows with test pressure differential of 10% of design loading.

E. Air infiltration: Maximum 0.15 cfm per square foot, tested in accordance with ASTM E 283.

F. Water infiltration: No uncontrolled water penetration, tested in accordance with ASTM E 547.

G. Field Measurement: Wherever possible, take field measurements prior to preparation of Shop Drawings and fabrication, to ensure proper fitting of work. However, proceed with fabrication and coordinate installation tolerances as necessary when field measurements might delay the Work.

1.05 DELIVERY, STORAGE, AND HANDLING: Deliver materials to job site in manufacturer or distributor's packaging undamaged complete with installation instructions. Store off ground, under cover, protected from weather and construction activities.

1.06 SPECIAL PROJECT WARRANTY: Provide written warranty signed by Manufacturer, Installer, and Contractor, agreeing to replace wood windows which fail in materials or workmanship within 3 years of Maintenance Release. Failure of materials or workmanship includes excessive leakage or air infiltration, excessive deflections, faulty operation, deterioration of construction in excess of normal weathering, and defects in hardware, weather-stripping, and other components of the Work.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on Pella Window & Door Company, 6370 Cole Road, Ridgeland, MS 39157. Tel. (601) 956-9544.

B. Equivalent products by the following manufacturers are acceptable:

1. Andersen Windows, 100 Fourth Ave, North, Bayport, MN 55003. Tel. (800) 426-7691 ext. 2427.
2. Marvin Windows & Doors, P.O. Box 100, Warroad, MN 56763. Tel (800) 346-5128.
3. Pozzi Wood Windows, 62845 Boyd Acres Road, Bend, OR 97701. Tel (800) 547-6880

C. Substitutions shall fully comply with specified requirements and Section 01630 - Product Options and Substitution Procedures

2.02 FRAME: Select softwood, water-repellent, preservative-treated in accordance with NWWDA I.S. 4. Interior exposed surfaces clear pine; all exterior surfaces primed. Overall frame depth; 4-3/8 inches. Jamb liner shall be high-impact polyvinyl chloride backed by continuous hard-tempered aluminum springs.

2.03 SASH: Select softwood, water-repellent, preservative-treated in accordance with NWWDA I.S. 4. Interior exposed surfaces clear pine; all exterior surfaces factory-primed. Corners mortised and tenoned, glued and secured with metal fasteners. Sash thickness: 1-3/4 inches. Sash shall pivot between jambs without removal.

2.04 GLAZING SYSTEM: Quality float glass complying with ASTM C1036. Groove-glazed 5/8 inch. InsulShield® argon-filled multi-layer low-E coated. Units with Integral Light Technology only: Insulating glass shall contain foam muntin grid between the two panes of glass. Foam grid shall be adhered to the glass. Muntin bars shall be solid 7/8-inch wide pine, water-repellent, preservative-treated in accordance with NWWDA I.S. 4. Bars shall be adhered to both sides of the insulating glass with VHB acrylic adhesive tape and align with the foam grid. Exterior surfaces primed; interior surfaces unfinished, ready for site finishing.

2.05 Weatherstripping: Foam with 3-mil vinyl skin at head and waterstop bar at sill; thermal-plastic elastomer bulb with slip-coating set into upper sash for tight contact at checkrail. Secondary polyvinyl chloride leaf-type weatherstrip at bottom sash and sill. PVC jamb liner at sides of sash.

2.06 INSECT SCREEN: Full-size with black vinyl-coated 18/16 mesh fiberglass screen cloth complying with Fs L-S-125B and ANSI-SMA-1004, set in aluminum frame fitted to outside of window, supplied complete with all necessary hardware. Screen frame shall be backed enamel, white.

2.07 HARDWARE: Galvanized block-and-tackle balances connected to sash with polyester cord and concealed within the frame. Self-aligning recessed sash lock factory-installed. Sash lift furnished for field installation. Two sash locks and lifts on units with 3' 0-3/4" frame width or greater. Finish shall be backed enamel, champagne.

2.08 INTERIOR FINISH: Unfinished ready for site finishing.

2.09 FABRICATION: Required sizes for frame units, including profile requirements, are shown on drawings. Any variable dimensions are indicated, together with maximum and minimum dimensions required to achieve design requirements and coordination with other Work. Details shown are based upon standard details by manufacturer indicated. Similar details by other manufacturers listed will be acceptable, provided they comply with other requirements, including profile limitations.

A. Prefabrication: To greatest extent possible, complete fabrication assembly, finishing, hardware application, and other work before shipment to project site. Disassemble components only as necessary for shipment and installation.

B. Reinforcing: Install reinforcing as necessary for performance requirements.

C. Continuity: Maintain accurate relation of planes and angles, with hairline fit of contacting members.

D. Fasteners: Conceal fasteners wherever possible.

PART 3 EXECUTION

3.01 INSTALLATION

A. Comply with manufacturer's instructions and recommendations for installation of wood windows. Set units plumb, level, and true to line, without warp or rack of framing members. Anchor securely in place.

B. Set sill members and other members in bed of compound as shown, or with joint fillers or gaskets as shown to provide weather-tight construction. Comply with requirements of Section 07920 for caulking and sealant.

3.02 ADJUSTING AND CLEANING: Adjust operating hardware to function properly, without binding, and to provide tight fit at contact points and weather-stripping.

A. Clean completed system, inside and out, promptly after erection and installation of glass and sealants. Remove excess glazing and sealant compounds, dirt, and other substances from surfaces.

B. Institute protective measures and other precautions required to assure that wood windows will be without damage or deterioration, other than normal weathering, at time of Maintenance Release.

END OF SECTION

SECTION 08710 DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES: Hardware as shown on the Drawings and in Schedules. Door hardware is hereby defined to include all items known commercially as builders hardware, as required for swing doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame. The required types of hardware include (but are not limited to) the following:

Butts and hinges
Lock cylinders and keys
Lock and latch sets
Bolts
Panic exit devices
Push/pull units
Closers
Door trim units
Stripping and seals
Thresholds

A. Items of hardware not definitely specified, but required for the completion and proper operation of the doors, shall be suitable in type, comparable to the type specified for similar openings. Labeled doors shall be fitted with labeled hardware.

B. All modifications of hardware required by reason of construction characteristics shall be such as to provide the proper operation or functional features. Contractor shall be fully responsible for checking all details, such as wall trim clearance, bevels, backsets, proper type strike plates, length of spindles, hands of locks, etc., in order that all items of hardware shall fit properly. Hardware for application to metal shall be made to standard templates. Template information shall be furnished to door and frame fabricators and all other trades requiring same, in order that they may cut, reinforce or otherwise prepare in the shop, materials for reception of hardware.

C. Hardware shall be free from defects affecting appearance and serviceability. Working parts shall be well fitted and smooth working without unnecessary play. All items of hardware shall be delivered to the building site in sufficient time in advance of its requirement for use for inspection prior to installation.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's product data, roughing-in diagrams, and Installation instructions for each type of hardware. Include operating instructions, maintenance information and spare part sources.

B. Contractor's Hardware Schedule: After all samples have been approved but prior to delivery of hardware, Contractor shall prepare and submit to the MDOT Architect a complete schedule of all finish hardware required. Schedule shall follow requirements of Specifications and shall indicate type, manufacturer's name and number, location and finish of each item required. Approval of schedule will not relieve Contractor of responsibility for furnishing all necessary hardware.

C. Submit such samples as required by the MDOT Architect for approval. Do not deliver hardware until approval is obtained.

1.03 QUALITY ASSURANCE

A. Perform work in accordance with the following requirements:

1. ANSI A117.1 – Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
2. NFPA 101.

B. Hardware Supplier: Company specializing in supplying commercial door hardware with five years documented experience and approved by manufacturer.

C. Hardware supplier shall have in his employment, an Architectural Hardware Consultant (AHC) in good standing as certified by the Society of Hardware Consultants Council. The Architectural Hardware Consultant shall assist the Contractor in installation and verify that hardware has been furnished and installed in accordance with manufacturer's instructions and as specified herein.

D. Templates: The hardware supplier shall provide templates and / or physical hardware to trades as required and in sufficient time to prevent delay in the execution of the Work.

1.04 PACKING AND MARKING: Package each item of hardware and lockset separately in individual containers, complete with screws, keys, instructions and installation template for spotting mortising tools. Mark each container with item number corresponding to number shown on Contractor's hardware schedule.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. Best Access Sys. Indianapolis, IN. Tel: (800) 311-1705.
2. Corbin Russwin Arch't. Hardware. Berlin, CT. Tel: (800) 543-3658.
3. Dorma Door Controls, Inc. Reamstown, PA. Tel: (800) 523-8483.
4. Hager Companies. Saint Louis, MO. Tel: (800) 325-9995.
5. LCN. Princeton, IL. Tel: (800) 526-2400.
6. McKinney Hinge. Scranton, PA. Tel: (800) 346-7707.
7. Pemko. Ventura, CA. Tel: (800) 283-9988.
8. Rockwood Manufacturing Co. Rockwood, PA. Tel: (800) 458-2424.
9. Schlage Lock Co. Colorado Springs, CO. Tel: (800) 847-1864.
10. Stanley Hardware. New Britain, CT. Tel: (800) 337-4393.
11. Trimco/BBW/Quality. Los Angeles, CA. Tel: (323) 262-4191.

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 KEYING / CYLINDERS

A. Furnish all cylinders & locksets with removable type cores. The removable core system shall be one that uses either temporary construction cores or construction keyed cores operated by a construction key until such time the construction key is rendered inactive by the change key or retractor key.

B. All cylinders shall be keyed in sets as directed by the MDOT Architect. Furnish 3 change keys per lock and 6 masterkeys per set.

2.03 MATERIALS: See Hardware Schedule at end of this Section. Products listed set standard.

PART 3 EXECUTION

3.01 INSTALLATION: Mount hardware units at heights recommended in "Recommended Locations for Builders' Hardware" NBHA, except as other wise specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by the Project Architect.

A. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finishes, re-install each item. Do not install surface-mounted items until finishes have been completed on the substrate.

B. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation. Drill and countersink units that are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

C. Cut and fit threshold and floor covers to profile of door frames, with mitered corners and hairline joints. Join units with concealed welds or concealed mechanical joints. Cut smooth openings for spindles, bolts and similar items, if any.

D. Screw thresholds to substrate with No. 10 or larger screws, of the proper type for permanent anchorage and of bronze or stainless steel that will not corrode in contact with the threshold metal.

1. At exterior doors, and elsewhere as indicated, set thresholds in a bed of either butyl rubber sealant or polyisobutylene mastic sealant to completely fill concealed voids and exclude moisture from every source.
2. Do not plug drainage holes or block weeps. Remove excess sealant.

3.02 ADJUSTING AND CLEANING: Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Lubricate moving parts with type lubrication recommended by manufacturer (graphite-type if no other recommended). Replace units that cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

3.03 SCHEDULE:

HW1 (For Exterior Doors to Toilet Rooms)
Each Opening Shall Have:

1 – Each Cont. Hinge	Markar	FM 100 X MPPC2 “Custom”
1 – Deadlock	Baldwin	8555 X 003
1 – Push Plate	Rockwood	#76 (4X30) X 3 PF X CFC
1 – Pull Plate	Rockwood	#76 (4X30) X 148 X 3 PF X CFC
1 – Closer	LCN	PA4040 EDA X Metal Cove X 605
1 – Kickplate	Rockwood	8 X 2 LDW 0.050 X US32D (Mounted push side)
1 – W/Strip	N. Guard	160VB (MTD. HD & Jamb)
1 – Threshold	N. Guard	896BR X Baldwin Lifetime Finish

HW2 (For Exterior Doors to Entrances & Guardhouse)
Each Opening Shall Have:

1 – Cont. Hinge	Markar	FM 100 X MPPC2 “Custom”
1 – Deadlock	Baldwin	8555 X 003
1 – Cyl. Ring Pull	Rockwood	90 X 3PF
1 – Push Plate	Rockwood	#76 (4X30) X 3 PF X CFC
1 – Pull Plate	Rockwood	#76 (4X30) X 148 X 3 PF X CFC
1 – Closer	LCN	4040 X Metal Cover X 605
1 – Kickplate	Rockwood	8 x 2 LDW 0.050 X 3PF (Mounted push side)
1 – W/Strip	N. Guard	160VB (MTD. HD & Jamb)
1 – Threshold	N. Guard	513 BR X Baldwin Lifetime Finish

HW3 (For Interior Doors to Toilet Rooms)
Each Opening Shall Have:

1 – Cont. Hinge	Markar	FM100 MPPC2 “ Custom”
1 – Push Plate	Rockwood	#76 (4X30) X 3 PF
1 – Pull Plate	Rockwood	#76 (4X30) X 148 X 3 PF
1 – Closer	LCN	4040 X Metal Cover X 605
1 – Kickplate	Rockwood	8 x 2 LDW 0.050 X 3PF (Mounted push side)

HW4 – HW8 (Not Used)

HW9 (for Exterior Door to Mechanical Room)
Each Opening Shall Have:

1 – Cont. Hinge	Markar	FM100 MP-PC Custom 80”
1 – Deadlock	Baldwin	8555 X 003
1 – Cyl. Ring Pull	Rockwood	90 X 3PF
1 – Kickplate	Rockwood	8 x 2 LDW X 0.050 X 3PF (Mounted push side)
1 – W/Strip	N. Guard	160VB (MTD. HD & Jamb)
1 – Threshold	N. Guard	896BR X Lifetime Finish X Required Length

END OF SECTION

SECTION 08800 GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES: Glass and glazing for doors, windows and other glazed openings, interior and exterior locations.

1.02 RELATED SECTIONS

A. Section 08210-Wood Doors.

B. Section 08230-AMP Colonial Doors, Panels & Framing

C. Section 08550-Wood Windows.

1.03 QUALITY ASSURANCE: 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.

A. Prime Glass Standard: FS DD-G-45l.

B. Heat-Treated Glass Standard: FS DD-G-l403.

C. Safety Glass Standard: CPSC l6 CFR l20l.

1.04 DELIVERY, STORAGE, AND HANDLING: Protect glass during transit, storage and handling to prevent scratching or breakage of glass. Replace all broken glass.

1.05 PROJECT CONDITIONS: 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, Inc., 1600 Parkwood Circle, Suite 300, Atlanta, GA 30339. Tel. (800) 766-2343.
2. Guardian Industries Corp., 14600 Romine Road, Carleton, MI 48117. Tel. (800) 521-9040.
3. Pilkington Libbey-Owens-Ford, P.O. Box 799, Toledo, OH 43697. Tel. (419) 246-6078.
4. PPG Industries, Inc., One PPG Place, Pittsburgh, PA 15272. Tel. (800) 377-5267.
5. Visteon Float Glass Operations, 17333 Federal Drive, Suite 230, Allen Park, MI 48101. Tel. (800) 521-6345.

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures

2.02 INSULATING GLASS

A. Material: 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. Unless shown otherwise on Drawings, use this type glass for all exterior applications.

B. Characteristics: Other requirements specified for glass characteristics, air space, sealing system, sealant spacer material, corner design and desiccant are as follows:

1. Thickness of Each Pane: 1/4 - inch.
2. Airspace Thickness: 1/2 – inch.
3. Sealing System: Manufacturer’s standard 1 inch sealing system.
4. Spacer Material: Manufacturer's standard metal.
5. Desiccant: Manufacturer's standard, either molecular sieve or silica gel.
6. Corner Construction: Manufacturer's standard.
7. Exterior Pane: Gray tinted.
8. Interior Pane: Clear

2.03 LAMINATED CLEAR SAFETY GLASS: Two layers of 1/8 inch glass Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select) with a 0.030 polyvinyl butyryl interlayer. Total thickness, 1/4 inch (plus). Unless shown otherwise on Drawings, use this type glass for all interior applications.

2.04 SETTING MATERIALS: 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 l/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 l/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

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 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 Substantial 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 09050 COLOR DESIGN

PART 1 GENERAL

1.01 SECTION INCLUDES: 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: 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 Engineer / MDOT Architect shall be contacted for a color selection. Subject to approval of the Project Engineer / MDOT 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: Section 01330 – Submittal Procedures.

1.04 SAMPLES: Samples shall be submitted for approval prior to applying or installing any finishes or items that are not included in this Section. See appropriate technical Sections for submittal requirements. Upon receipt of samples, the MDOT Architect may make revisions to the Color schedule.

PART 2 PRODUCTS

2.01 MATERIALS: 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 shall in no way limit competition.

2.02 MANUFACTURERS: The following manufacturers were used in preparing the Color Schedule:

SECTION / MATERIAL	MANUFACTURER / NUMBER & COLOR NAME	COLOR DESCRIPTION
• 04200 - Brick	Match Existing	
• 04200 - Mortar	Match Existing	
• 04200 - Weeps	CavClear Match mortar color	
• 04200 - Conc. Block Walls	ICI#438-Swiss Almond (P1)	(light beige)
• 05500 - Miscellaneous Steel	ICI #1094-Olde Hunter (P5)	(dark green)
• 05500 - Misc. Stl. (Ornamental)	ICI #1094-Olde Hunter (P5)	(dark green)
• 05500 - Misc. Stl. (Soffit Vent)	Arch Grille #RAL9001 49/10016	(light beige)
• 06400 - Architectural Woodwork	ICI #443 Llama White (P3)	(off white)
• 06400 - Solid Plastic (SS #1)	Formica Surell - Spanish Paprika	(brown)
• 06400 - Solid Plastic (SS #2)	Formica Surell - Dawn Mist	(beige)
• 06400 - Dr & Window Wood Trim	ICI #443-Llama White (P3)	(off white)
• 06400 - Ceiling & Crown Molding	ICI #434-Pink Beige (P2)	(med. Beige)
• 06400 - Soffit & Porch Ceiling	ICI #2013-White High-Hiding RM (P4)	(white)

• 07610 - Metal Roofing & Trim	Petersen-Copper Penny	(bright copper)
• 07610 - Copper Gutters & DS	Match Existing Copper	(real copper)
• 07920 - Joint Sealants	Pecora (Match adjacent lighter color)	
• 08210 - Wood Doors (Interior)	ICI #(Match Existing-Stain or Paint)	(brown or white)
• 08210 - Wood Doors (Exterior)	ICI #443 Llama White (P3)	(off white)
• 08210 - Wood Door Shutters (Ext.)	ICI #1094 Olde Hunter (P5)	(dark green)
• 08320 - AMP Doors (Interior)	Match ICI #1094 Olde Hunter	(dark green)
• 08320 - AMP Doors (Exterior)	Match ICI #1094 Olde Hunter	(dark green)
• 08334 - Rolling Counter Doors	Raynor Door-Bronzed Anodized	(brown)
• 08550 - Wood Windows	ICI #443 Llama White (P3)	(off white)
• 08710 - Door Hardware	(Brass to Match Existing)	(dark brown)
• 09250 - Gypsum (Walls)	ICI #438-Swiss Almond (P1)	(light beige)
• 09250 - Gypsum (Ceilings)	ICI #2013-White High-hiding RM(P4)	(white)
• 09310 - Ceramic Tile Floor #1	Daltile #DC02Almond (8”x8”)	(light beige)
• 09310 - Ceramic Tile Floor #2	Daltile #DC07 Sage Green (8”x8”)	(light green)
• 09310 - Ceramic Tile Floor #3	Daltile #DC09 Hunter (8”x8”)	(dark green)
• 09310 - Ceramic Tile Wall #4	Daltile #K165 Almond (4 ¼”x4 ¼”)	(off white)
• 09310 - Cer. Tile Cove & Wall #5	Daltile #K112 Timberline (4 ¼”x4 ¼”)	(dark green)
• 09310 - Grout (Floors & Walls)	Laticrete #61-Parchment	(tan)
• 09650 - Resilient Floor	American Tile #593 Mushroom	(tan)
• 10100 - Visual Display Board	Claridge #1691 Quartz	(beige)
• 10170 - Toilet Partition	Comtec #D406-Sand Castle	(beige)
• 10400 - Specialty Signs (Bkground)	Mohawk #118 Green	(dark green)
• 10400 - Specialty Signs (Letters)	Mohawk #226 Beige	(beige)
• 10670 – Storage Shelving	Penco #012 Tawny Tan	(tan)
• 11455 - Appliances (Cook Top)	GE-White	(white)
• 11455 - Appliances (Microwave)	GE-White	(white)
• 11455 - Appliances (Refrigerator)	GE-White	(white)
• 12485 - Floor Mats	C/S Group #9316 Spruce	(green)
• 12485 – Carpet Floor Mats	C/S Group #907 Hearty Moss	(green)
• 15450 – Lav Bowl/Sprayhd Cover	Bradley – Emerald	(dark green)
• 15450 – Lav Panel/Sprayhd Body	Bradley – Putty	(beige)

PART 3 EXECUTION

3.01 EXECUTION: 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 MDOT Architect upon written notification and subsequent submittals by the Contractor.

END OF SECTION

SECTION 09125 SUSPENDED GYPSUM BOARD SYSTEM

PART 1 GENERAL

1.01 SECTION INCLUDES: The extent of the suspended gypsum board drywall system is shown on the Drawings and in schedules. The types of work required include the following:

A. Ceiling suspension systems.

B. Drywall system face-type gypsum board work.

C. Trim and accessories that are installed prior to or concurrent with gypsum board.

1.02 SUBMITTALS: Submit product data and installations instructions for each gypsum board drywall system required, including other data as may be required to show compliance with these specifications. Distribute a copy of each installation instructions to the installer.

1.03 QUALITY ASSURANCE

A. 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.

B. Allowable Tolerances: 1/8 inch offsets between planes of board faces, and 1/4 inch in 8 ft. for plumb, level, warp and bow.

C. Manufacturer: Obtain gypsum board, framing and fasteners, trim accessories, adhesives and joint treatment products from a single manufacturer, or from manufacturers recommended by the prime manufacturer of gypsum board, by one of the following:

1. Georgia-Pacific Corp, Atlanta, GA, Tel. (800) 327-2344.
2. National Gypsum Company, Charlotte, NC, Tel. (800) 343-4893.
3. United States Gypsum Company, Chicago, IL, Tel. (800) 874-4968.

1.04 PRODUCT HANDLING: 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 CEILING SUPPORT MATERIALS

A. Main Runners: 1-1/2 inch steel channels, either cold-rolled at 0.475 pounds per foot or hot-rolled at 1.12 pounds per foot, rust-inhibitive paint finish.

B. Furring Members: Screw-type hat-shaped furring channels of 25 gage zinc-coated steel; comply with ASTM C 645.

C. Furring Members: Screw-type “Cee” shaped studs of depth indicated, of 25 gage zinc-coated steel; comply with ASTM C 645.

D. Hanger Wire: Galvanized, soft-temper steel wire complying with ASTM A 641, Class 1 coating, prestretched; sized in accordance with ANSI A42.4 unless otherwise indicated.

E. Hanger Anchorage: Comply with ANSI A42.4 for concrete inserts, clips, bolts, screws and other devices applicable to the indicated method of structural anchorage for ceiling hangers. Size devices for 3 by calculated load supported, except size direct-pull concrete inserts for 5 by calculated load.

F. Furring Anchorage: Galvanized, 16-gage wire ties, manufacturer’s standard wire-type clips. Bolts, nails or screws as recommended by furring manufacturer and complying with ANSI A42.4.

2.02 GYPSUM BOARD PRODUCTS: Specified in Section 09250 – Gypsum Board.

2.03 TRIM ACCESSORIES

A. Provide 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. Semi-Finishing Type: Manufacturer’s standard trim units that are not to be finished with joint compound (non-beaded).

C. Plastic Edge Trim: Manufacturer’s standard rigid or semi-rigid PVC moldings of the semi-finishing type, shaped to provide resilient contact of gypsum board edges with other work; friction-fit, or pressure-sensitive adhesive mounting.

2.04 JOINT TREATMENT MATERIALS: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.

A. Joint Tape: Perforated type.

B. Joint Compound: Provide chemical hardening type for bedding and filling, ready-mixed vinyl type or non-case in-type for topping.

2.05 MISCELLANEOUS MATERIALS

A. Laminating Adhesive: The type and grade of adhesive or compound recommended by the gypsum board manufacturer, for laminating gypsum board together in applications as indicated.

B. Fastening Adhesive: The type and grade of adhesive recommended by the gypsum board manufacturer for fastening board to structural supports or substrates as indicated.

C. Gypsum Board Fasteners: Comply with GA-216, and with gypsum board manufacturer's recommendations.

PART 3 EXECUTION

3.01 EXAMINATION: 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.

3.02 INSTALLATION REQUIREMENTS

A. Comply with ANSI A42.4 as applicable to the type of substrate and drywall support system indicated; and comply with the Gypsum Association GA-203 for installation of furring members.

B. Coordinate and integrate where possible, the installation of trim accessories with the installation of gypsum board. 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.

C. Secure hanger wires to structural supports by wire-typing directly to structure where possible, otherwise tie to inserts, clips and other anchorage devices or fasteners as indicated. Wire-tie hanger wires to main runners.

D. Space main runners 4 feet on center and space hangers at 4 feet on center along runners, except as otherwise indicated.

E. Level main runners to a tolerance of 1/4 inch in 12 feet, measured both lengthwise in each runner and transversely between parallel runners.

F. Wire-tie or clip furring members to main runners and to other structural supports as indicated.

G. Space furring members at 24 inches on center except as otherwise indicated.

3.03 PROTECTION OF WORK: 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 09250 GYPSUM BOARD

PART 1 GENERAL

1.01 SECTION INCLUDES: Gypsum board work with a tape-and-compound joint treatment system known as "drywall finishing" work. The types of work required include the following:

A. Gypsum board including screw-type metal support system.

B. Gypsum board applied to metal and wood framing and furring.

C. Gypsum backing boards for application of other finishes.

D. Drywall finishing (joint tape-and-compound treatment).

1.02 SUBMITTALS: Submit manufacturers technical product data, installation instructions and recommendations for products specified.

1.03 QUALITY ASSURANCE: 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.

A. 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.

B. Allowable Tolerances: 1/8 inch offsets between planes of board faces, and 1/4 inch in 8 ft. for plumb, level, warp and bow.

C. 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.

1.04 PRODUCT HANDLING: 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: 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.

A. Interior Studs: ASTM C 645; 25 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 doorjambs and at door and opening headers.

B. Furring Members: ASTM C 645; 25 gage, hat-shaped. Where shown as "Resilient", provide manufacturer's special type designed to reduce sound transmission.

C. Fasteners: Type and size recommended by furring manufacturer for the substrate and application indicated.

2.02 GYPSUM BOARD PRODUCTS: 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:

A. Edge Profile: Special rounded or beveled edge.

B. Sheet Size: Maximum length available, which will minimize end joints.

C. Thickness: 5/8 inch, except where otherwise indicated.

D. Water-resistant Type (WR-1): Provide where indicated; 5/8 inch thick, except where otherwise indicated.

E. Cement Board: Provide water-resistant cement based backer board, 5/8 inch thick Durock, as a base for ceramic tile.

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: General: ASTM C 475; type recommended by the manufacturer for the application indicated, except as otherwise indicated.

A. Joint Tape: Perforated type.

B. 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: 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.

PART 3 EXECUTION

3.01 INSTALLATION OF METAL SUPPORT SYSTEMS: 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 study 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.

A. 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.

B. 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: 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, comply with manufacturer's instructions and requirements for fire resistance ratings (if any), whichever is most stringent.

A. Install sound attenuation blankets and insulation as indicated, prior to gypsum board unless readily installed after board has been installed.

B. 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.

C. 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.

D. Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide l/4 inch to l/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.

E. 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.

F. Space fasteners in gypsum boards in accordance with GA-2l6 and manufacturer's recommendations, except as otherwise indicated.

3.03 SPECIAL GYPSUM BOARD APPLICATIONS

A. Install exposed gypsum board by fastening with screws.

B. Wall Tile Base: Where drywall is base for thin set ceramic tile and similar rigid applied wall finishes, install cement based backing board. At toilets, showers, labs, janitor closets, and similar "wet" areas, install water-resistant gypsum board. Apply with uncut long edge at bottom of work, and space l/4 inch above fixture lips. Seal ends, cut-edges and penetrations of each piece with water-resistant sealant before installation.

3.04 INSTALLATION OF DRYWALL TRIM ACCESSORIES: 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.

A. Install metal corner beads at external corners of drywall work.

B. 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.

3.05 INSTALLATION OF DRYWALL FINISHING: 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.

A. Apply joint tape at joints between gypsum boards, except where a trim accessory is indicated.

B. Apply joint compound in 3 coats (not including pre-fill of openings in base), and sand between last 2 coats and after last coat.

C. Base for Ceramic Tile: Do not install drywall finishing where ceramic tile and similar rigid applied finishes are indicated.

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.

3.06 PROTECTION OF WORK: 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 09310 CERAMIC TILE

PART 1 GENERAL

1.01 SECTION INCLUDES: Thin set ceramic mosaic floor tile, glazed cove base, wall tile and accessories.

1.02 RELATED SECTIONS

A. Section 07260 – Vapor Retarders (Floor protection paper).

B. Section 09050 – Color Design.

1.03 SUBMITTALS

A. Submit manufacturer's product data and written instructions for recommended installation and maintenance practices for each product specified.

B. Submit 2 samples of types and colors of tile and grout required in similar pattern of tile shown on Drawings, mounted on not less than 12 inches square plywood or hardboard and grouted as required.

C. Submit one full size sample of each tile accessory and marble threshold. Submit samples of trim and other units if requested by the MDOT Architect. Review will be for color, pattern and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

1.04 QUALITY ASSURANCE

A. Furnish tile conforming to the Standard Grade Requirements of ANSI A137.1.

B. When using setting and grouting materials manufactured under TCA license, include identification, and formula number on each container. Provide materials obtained from only one source for each type of tile, grout and color to minimize variations in appearance and quality.

C. Install ceramic tile in accordance with manufacturers instructions and applicable installation specifications of the Tile Council of America's "Handbook for Ceramic Tile Installation", latest edition.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING: Deliver packaged materials and store in original containers with seals unbroken and labels intact until time of use, in accordance with manufacturer's directions.

1.06 PROJECT CONDITIONS: Continuously heat areas to receive tile to 50 degrees F. for at least 48 hours prior to installation, when project conditions are such that heating is required. Maintain 50 degrees F. temperature continuously during and after installation as recommended by tile manufacturer but not less than 7 days. Maintain a minimum lighting level of 50 fc during installation.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. American Olean Tile Company, Lansdale, Pennsylvania
2. Dal-Tile Corporation, Dallas, Texas
3. Floor Gres Ceramiche, Italy
4. Florida Tile Industries, Lakeland, Florida.
5. Lone Star Porcelain Mosaic Tile, Dallas, Texas
6. United States Ceramic Tile Co., East Spatra, Ohio

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 CERAMIC MOSAIC FLOOR TILE: 8 inches by 8 inches by 5/16 inch, cushioned edge, unglazed, color to be selected from standard colors available.

2.03 CERAMIC BASE TILE: 4-1/4 inches by 4-1/4 inches by 5/16 inch, cushioned edge, bright glaze, cove base round top, color to be selected from standard colors available.

2.04 GLAZED WALL TILE: Size 4-1/4 inches by 4-1/4 inches by 5/16 inch, cushioned edge, bright glaze, colors to be selected from standard colors available.

2.05 TRIM AND SPECIAL SHAPES

A. Provide necessary units with rounded internal and external corners, and rounded internal and external corner units of same material and finish as field tile, and as follows:

1. Base: Sanitary cove units.
2. External Corners: Bullnose shapes, with a radius of not less than 3/4 inch, unless otherwise shown.
3. Internal Corners: Field-butted square, except use square corner, combination angle and stretcher type cap.

2.06 MARBLE THRESHOLDS: Provide sound Group "A" marble with an abrasive hardness of not less than 10.0, when tested in accordance with ASTM C 241. Color of marble threshold to be selected by the MDOT Architect from manufacturer's full range of standard colors.

2.07 ADHESIVE: ANSI A136.1 and ANSI A118.4 when mixed with additive, with Tile Contractor's Association or Adhesive and Sealant Council certification of conformance, for base and wall tile set on each type of substrate. Provide primer-sealer as recommended by adhesive manufacturer. Equal to Laticrete Type 272 Premium or 317 Floor 'N Wall Thin-Set with 333 Super Flex Additive. Equivalent products by Mapei and Bostik are acceptable.

2.08 GROUT: ANSI A 118.3, with Tile Contractor's Association certification of conformance. Proprietary compound composed of 100 percent Solid Epoxy for a more flexible and less permeable grout. Equal to Laticrete Type LATAPOXY SP-100 Stainless Epoxy Grout. Equivalent products by Mapei and Bostik are acceptable. Color of grout to be selected by the MDOT Architect from manufacturer's full range of standard colors.

PART 3 EXECUTION

3.01 INSPECTION: Installer must examine the substrate and the conditions under which ceramic tile 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 Work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION

A. Comply with the applicable parts of ANSI 108 Series of tile installation standards included under “American National Standard Specifications for the Installation of Ceramic Tile", and the tile and grout manufacturer's printed instructions, and applicable installation specifications of the Tile Council of America's "Handbook for Ceramic Tile Installation", latest edition.

B. Handle, store, mix and apply proprietary setting and grouting materials in compliance with the manufacturer's instructions.

C. Extend tile Work into recesses and under equipment and fixtures, to form a complete covering without interruptions, except as otherwise shown. Terminate Work neatly at obstructions, edges and corners without disruption of pattern or joint alignment.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight, aligned joints. Fit tile closely to electrical outlets, piping, and fixtures so that plates, collars, or covers overlap tile.

3.03 JOINTING PATTERN: Unless otherwise shown, lay tile in grid pattern. Align joints where adjoining tiles on floor, base, walls and trim are the same size. Layout tile Work and center tile fields both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise shown.

3.04 COLOR PATTERN: A simple color pattern shall be provided with approved color chart and sample submittal to Contractor using 3 or less colors on walls and floors.

3.05 CLEANING AND PROTECTION

A. Cleaning: Clean grout and setting materials from face of tile while materials are workable. Leave tiles face clean and free of all foreign matter. Unglazed tile may be cleaned with acid solutions only when permitted by the tile and grout manufacturer's printed instructions, but not sooner than 14 days after installation. Protect metal surfaces, cast iron and vitreous plumbing fixtures from effects of acid cleaning. Flush the surface with clean water before and after cleaning.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile Work.

C. Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile Work by covering with floor protection paper during the construction period to prevent damage and wear. Prohibit all foot and wheel traffic from using tiled floors for 7 days after installation. Before final inspection, remove protective covering and rinse neutral cleaner from all tile surfaces.

END OF SECTION

SECTION 09900 PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

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.

B. The Work includes field painting of exposed bare and covered pipes and ducts (including color coding), and of hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under the mechanical and electrical Work, except as otherwise indicated.

C. "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.

D. 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 MDOT Architect will select these from standard colors available for the materials system specified.

1.02 PAINTING NOT INCLUDED: 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.

A. Shop Priming: Unless otherwise specified, shop priming of ferrous metal items is included under the various Sections for structural steel, miscellaneous metal, hollow metal work, and similar items. Also, for fabricated or factory-built mechanical and electrical equipment or accessories.

B. 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) plastic toilet enclosures, prefinished partition systems, acoustic materials, architectural woodwork and casework, finished mechanical and electrical equipment including light fixture, switch-gear and distribution cabinets, elevator entrance frames, door and equipment.

C. 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, duct shafts and elevator shafts.

D. 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.

E. 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 RELATED SECTIONS: Section 09050 – Color Design.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's technical information including basic materials analysis and application instructions for each coating material specified.

B. Samples: Submit color samples for selection by MDOT Architect from full range of colors.

1.05 QUALITY ASSURANCE: On actual wall surfaces and other exterior and interior building components, duplicate painted finishes as specified. On at least 100 sq. ft. of surface as directed, provide full-coat finish samples until required sheen, color and texture is obtained; simulate finished lighting conditions for review of in-place Work.

1.06 DELIVERY AND STORAGE: 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.

1.07 PROJECT CONDITIONS

A. Apply water-base paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 50 degrees F. and 90 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and the surrounding air temperatures are between 45 degrees F. and 95 degrees F. unless otherwise permitted by the paint manufacturer's printed instructions.

C. 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.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by ICI Dulux Paints, 925 Euclid Ave., Cleveland, OH 44115. Tel. (800) 984-5444.

B. Equivalent products by the following manufacturers are acceptable:

1. Devoe - 925 Euclid Ave., Cleveland, OH 44115.Tel. (888) 265-6753.
2. Benjamin Moore & Company, 51 Chestnut Ridge Road, Montvale, NJ 07645. Tel. (800) 344-0400.

3. Porter Paints, 400 S. 13th Street, Louisville, KY 40203. Tel. (800) 332-6270.
4. PPG Architectural Finishes, Inc., One PPG Place, Pittsburgh, PA 15272. Tel. (800) 441-9695.
5. Sherwin-Williams Company, 101 Prospect Ave., NW, Cleveland, OH 44115. Tel. (800) 321-8194.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures

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 MDOT 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. Color 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 Project Engineer / MDOT 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.

2.04 PAINT SYSTEMS: Provide the following paint systems for the various substrates, as indicated.

A. Exterior Paint Systems are as follows:

1. Ferrous Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   (First coat not required on items that are shop primed.)
   Not less than 2.5 mils dry film thickness.

2. Zinc Coated Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   Not less than 2.5 mils dry film thickness.

3. Painted Woodwork
   1st Coat – Acrylic Primecoat – ICI Ultra-Hide # 2010
   2nd Coat – Acrylic Semi Gloss Enamel – ICI Dulux Professional # 2406
   3rd Coat – Acrylic Semi Gloss Enamel – ICI Dulux Professional # 2406
   Not less than 2.5 mils dry film thickness.
4. Metal Trench Floor Plate
   1st Coat – Modified Epoxy Primer– ICI Devshield # 4130
   2nd Coat – Alkyd Urethane Gloss Enamel – ICI Devshield # 4328
   3rd Coat – Alkyd Urethane Gloss Enamel – ICI Devshield # 4328
   (Mix with non-skid additive per Manufacturers recommendation)
   Not less than 4.5 mils dry film thickness.
5. Exterior Pavers and Concrete Porch
   1st Coat – Prosoco Sure Klean Paver Enhancer
   2nd Coat – Prosoco Sure Klean Paver Enhancer

B. Interior Paint Systems are as follows:

1. Gypsum Drywall
   1st Coat – Latex Primer – ICI Ultra-Hide # 1030
   2nd Coat – Alkyd Semi Gloss Enamel – ICI Ultra-Hide # 1516
   3rd Coat – Alkyd Semi Gloss Enamel – ICI Ultra-Hide # 1516
   Not less than 2.5 mils dry film thickness.
2. Gypsum Drywall (in wet areas)
   1st Coat – Waterborne Primer – ICI Ultra-Hide Gripper # 3210
   2nd Coat – Polyamide Epoxy Gloss – ICI Tru-Glaze # 4508
   3rd Coat – Polyamide Epoxy Gloss – ICI Tru-Glaze # 4508
   Not less than 4.0 mils dry film thickness.
3. Concrete Masonry Units (Enamel)
   1st Coat – Surface Filler – ICI Bloxfil # 4000
   2nd Coat – Waterborne Primer – ICI Ultra-Hide Gripper # 3210
   3rd Coat – Alkyd Semi Gloss Enamel – ICI Ultra-Hide # 1516
   Apply filler coat at a rate to ensure complete coverage with all pores filled.
   Not less than 4.0 mils dry film thickness, excluding first coat.
4. Zinc Coated Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   Not less than 2.5 mils dry film thickness.
5. Ferrous Metal
   1st Coat – Waterborne Acrylic Primer – ICI Devflex # 4020
   2nd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   3rd Coat – Waterborne Acrylic Semi Gloss Enamel – ICI Devflex # 4206
   (First coat not required on items that are shop primed.)
   Not less than 2.5 mils dry film thickness.
6. Painted Woodwork
   1st Coat – Alkyd Enamel Undercoat – ICI Ultra-Hide # 1120
   2nd Coat – Alkyd Semi Gloss Enamel – ICI Ultra-Hide # 1516
   3rd Coat – Alkyd Semi Gloss Enamel – ICI Ultra-Hide # 1516
   Not less than 2.5 mils dry film thickness.
7. Stained Woodwork
   1st Coat – Oil Stain – ICI Woodpride # 1700
   2nd Coat – Polyurethane Satin Finish – ICI Woodpride # 1902
   3rd Coat – Polyurethane Satin Finish – ICI Woodpride # 1902

8. Interior Brick Pavers
   1st Coat – Prosoco Stand Off Gloss 'N Guard
   2nd Coat – Prosoco Stand Off Gloss 'N Guard
   3rd & 4th Coats – Prosoco Stand Off Gloss 'N Guard, if required for uniform appearance.

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. 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: Perform preparation and cleaning procedures in strict accordance with the paint manufacturer's instructions and as herein specified, for each particular substrate condition. 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. Remove, if necessary, for the complete painting of the items and adjacent surfaces. Following completion of painting of each space or area, re-install the removed items by workmen skilled in the trades involved. Clean surfaces to be painted before applying paint or surface treatments. Remove oil and grease prior to mechanical cleaning. Schedule the cleaning and painting so that contaminates from the cleaning process will not fall onto wet, newly painted surfaces.

A. 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.

B. Galvanized Surfaces: Clean free of oil and surface contaminants with acceptable non-petroleum based solvent.

C. Wood: Clean wood surfaces to be painted of all dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, and dust off. Scrape and clean small, dry, seasoned knots and apply a thin coat of white shellac or other recommended knot sealer before application of the priming coat.

1. Prime, stain, or seal wood required being job-painted, immediately upon delivery to job. Prime edges, ends, faces, under sides, and backsides of such wood, including cabinets, counters, cases, paneling, etc. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood-filler. Sandpaper smooth when dry.
2. When transparent finish is required, use spar varnish for backpriming. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or equivalent sealer immediately upon delivery to project.

3.03 MATERIALS PREPARATION: 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 applicators 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 Painting: 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 is limited to those items exposed in mechanical equipment rooms and in occupied spaces.

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. Transparent (Clear) Finishes: Use multiple coats to produce glass-smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats, unless otherwise indicated.

L. Completed Work: Match approved samples for color, texture and coverage. Remove, refinish or repaint Work not in compliance with specified requirements.

3.05 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 any 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.

END OF SECTION

SECTION 10100 VISUAL DISPLAY BOARDS

PART 1 GENERAL

1.01 SECTION INCLUDES: Visual display boards as described in this section. Types specified in this section include Visual Aid Board.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's technical data and installation instructions for each material and component part, including data substantiating materials comply with requirements.

A. Samples: Submit full range of color samples for visual Aid board, surface, trim and accessories required. Provide 12-inch square samples of sheet materials and 12-inch lengths of trim members for color verification after selections have been made.

B. Shop Drawings: Submit sections of typical trim members and dimensioned elevations. Show anchors, grounds, reinforcement, accessories, and installation details.

C. Certification: Submit manufacturer's certification that all materials furnished for Project complies with requirements specified herein.

1.04 QUALITY ASSURANCE

A. 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 not more than 25. Fuel contributed not more than 25. Smoke developed not more than 25.

B. Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication where possible, to ensure proper fitting of Work.

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. Local Supplier is West Architectural Specialties, Inc. Tel. (601) 982-1601.

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 01630-Product Options and Substitution Procedures

2.02 MATERIALS: Visual Aid Board shall be equal to Claridge No. 2040 Bulletin Board Cabinet, double door cabinet with dark bronze anodized finish. Cork tack surface shall be finished with “designer fabric surface” in colors and textures as selected by MDOT Architect from manufacturer's standards. Tempered glass doors shall be fitted with flat key tumbler locks and hung on piano hinges. Size shall be 4 feet by 4 feet.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine area and conditions under which unit is 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: Deliver factory-built unit completely assembled in one piece without joints, whenever possible. Where dimensions exceed panel size, provide 2 or more pieces of equal length as acceptable to MDOT Architect. When overall dimensions require delivery in separate units, pre-fit at factory, disassemble for delivery, and make final joints at site. Use splines at joints to maintain surface alignment.

A. Install unit in location and mounting height as shown on Drawings and 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. If unit is not shown on Drawings, install unit in location as directed by Project Engineer.

B. 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 are properly installed, adjusted and properly functioning.

B. Clean unit in accordance with manufacturer's instructions, breaking in only as recommended.

END OF SECTION

SECTION 10170 SOLID PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES: Solid plastic, floor-mounted, overhead braced toilet compartments and wall-hung urinal screens.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's sample warranty, color charts and detailed technical data for materials, fabrication, and installation, including catalog cuts of anchors, hardware, fastenings, and accessories.

B. Shop Drawings: Submit job-specific shop drawings for fabrication and erection of toilet compartment assemblies not fully described by product drawings, templates, and instructions for installation of anchorage devices built into other Work.

1.04 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication where possible, to ensure proper fitting of Work. However, allow for adjustments within specified tolerances wherever taking of field measurements before fabrication might delay Work.

B. Coordination: Furnish inserts and anchorage, which must be built into other work for installation of toilet partitions and related work; coordinate delivery with other work to avoid delay.

1.05 DELIVERY, STORAGE AND HANDLING: Upon receipt of toilet partitions and other materials, installer shall examine the shipment for damage and completeness. Materials shall be stored in a clean, dry place. Stack all materials to prevent damage.

1.06 WARRANTY: Manufacturer to supply a written warranty covering all plastic components against breakage, warping, corrosion and delamination for a period of 15 years.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Comtec Industries, 801 Corey Street, Moosic, PA, 18507. Tel. (800) 445-5148. Local Supplier is West Architectural Specialties, Inc. Tel. (601) 982-1601.

B. Equivalent products by the following manufacturers are acceptable:

1. Knickerbocker Partition Corp, P.O. Box 3035, Freeport, NY 11520. Tel. 95160 546-0550.
2. The Mills Company, 38025 Second Street, Willoughby, OH 44094. Tel. (440) 951-8877.
3. Santana Products Co., Inc., 1300 Meylert Ave., Scranton, PA 18509. Tel (510) 343-7921.

C. Substitutions shall fully comply with specified requirements and Section 01630 - Product Options and Substitution Procedures.

2.02 MATERIALS

A. General: Provide materials that have been selected for surface flatness and smoothness. Exposed surfaces that exhibit pitting, seam marks, roller marks, stains, discoloration, telegraphing of core material, or other imperfections on finished units are not acceptable.

B. Doors, partitions, pilasters and urinal screens shall be fabricated from High Density Polyethylene (HDPE) material manufactured under high pressure forming a single component section which is waterproof, non- absorbent and has a self-lubricating surface that resists marring with pens, pencils or other writing utensils. All to arrive at job site with special protective plastic covering.

C. Characteristics: Dual component compression molded High Density Polyethylene (HDPE) of solid virgin resin materials in colors that extend throughout the surface; doors, partitions and pilaster shall have (HDPE) as the core material).

1. Doors, partitions, pilasters and urinal screens shall be a minimum of 1 inch thick and all edges machined to a radius of 0.250 inch and all exposed surfaces to be free of saw marks.
2. Doors and dividing panels shall be 55 inches high and mounted 14 inches above the finish floor.
3. Pilasters shall be 82 inches high and fastened into a 3-inch high stainless steel pilaster shoe with a stainless steel, torx head sex bolt.
4. Urinal screens shall be 24 inches wide X 42 inches high with 41 inch continuous aluminum wall brackets.
5. Finish shall be similar and equal to Comtec Designer Series D400. Color of doors and pilasters to be selected by the MDOT Architect from Manufacturer's full color range.
6. Aluminum (heat sinc) edging strips to be fastened to the bottom edge of all doors and panels using vandal proof stainless steel fasteners.

2.03 HARDWARE

A. Door hardware: Door hardware shall be as follows:

1. Hinges shall be manufacturer's aluminum continuous for door height.
2. Each door shall be supplied with one coat bumper / hook made of chrome plated zamak. Each handicapped door to include one door pull and one wall stop.
3. Door strike and keeper shall be fabricated from heavy-duty aluminum extrusion (6463-T5 alloy) with clear anodized finish with wrap around flange surface mounted and through bolted to pilaster with one-way sex bolts. Size of strike shall be 6 inches in length.
4. Door latch housing shall be fabricated from heavy-duty aluminum extrusion (6463-T5 alloy) with clear anodized finish; surface mounted and through bolted to door with one-way sex bolts. Slide bolt and button shall be heavy aluminum with a black anodized finish.

B. Wall Brackets: Wall brackets shall be full-length continuous aluminum. Brackets shall be used for all pilasters to pilaster and pilasters to wall connections. Attach brackets to adjacent wall construction with No. 14 by 1-1/2 inch stainless steel Phillips head screws. Anchor screws directly behind the vertical edge of pilasters at 12-inch intervals along the full length of bracket and at each 12-inch interval alternately spaced between anchor connections.

C. Headrail: Headrail shall be made of heavy-duty extruded aluminum (6463-T5 alloy) with anti-grip design. The headrail shall have a clear anodized finish and shall be fastened to the headrail bracket by a stainless steel, torx head sex bolt, and fastened to the tops of pilasters with stainless steel, tamper resistant torx screws.

D. Headrail Brackets: Headrail brackets shall be 16-gage stainless steel with a satin finish, and secured to the wall with #14 stainless steel screws.

E. Accessories: Furnish units with chromium-plated finish, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine the areas and conditions under which toilet partitions and related items are to be installed, including supporting anchors and supports installed by others, and must notify 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 manner acceptable to the Installer.

3.02 INSTALLATION: Comply with manufacturer's recommended procedure and installation sequence. Install partitions rigid, straight, plumb, and level. Secure partitions in position with manufacturer's recommended anchoring devices. Provide clearances of not more than 1/2 inch between pilasters and panels, and not more than one inch between panels and walls. Clearance at vertical edges of doors shall be uniform top to bottom and shall not exceed 1/4 inch.

3.03 ADJUSTING AND CLEANING

A. Adjusting: Adjust and lubricate hardware for proper operation. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors (and entrance swing doors) to return to fully closed position.

B. Cleaning: Clean exposed surfaces of partition systems using materials and methods recommended by manufacturer, and provide protection as necessary to prevent damage during remainder of construction period.

END OF SECTION

SECTION 10400 IDENTIFICATION DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES: Signage for room identification system, informational and directional signage.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's technical data and installation instructions for each type of sign required.

A. Samples: Submit samples of each color and finish of exposed materials and accessories required for specialty signs. MDOT Architect's review of samples will be for color and texture only. When requested, furnish full-size samples of specialty sign materials.

B. 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.

1.04 QUALITY ASSURANCE: 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: Deliver components correctly packed to prevent damage. Store in secure area out of weather. Handle per manufacturer's instructions.

1.06 WARRANTY: Provide manufacturer's standard one-year warranty covering manufacturing defects.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and specifications are based on products manufactured by Mohawk Sign Systems, Inc., P.O. Box 966, Schenectady, NY 12301. Tel. (518) 370-3433.Local Supplier is West Architectural Specialties, Inc. Tel. (601) 982-1601.

B. Equivalent products by the following manufacturers are acceptable:

1. ASI Sign Systems, Inc., 3890 W. NW Hwy., Suite 102, Dallas, TX 75220. Tel. (800) 274-7732.
2. Best Sign Systems, 1202 North Park Avenue, Montrose, CO 81401. Tel. (970) 249-2378.
3. Scott Sign Systems, Inc., 7524 Commerce Pl., Sarasota, FL 34243. Tel. (800) 237-9447.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures

2.02 SIGN SYSTEM

A. Restroom Signage: Wall mounted Series 200A Sand carved, Helvetica letter style.

B. Informational Signage: Wall mounted Series 200A Sand carved, Helvetica letter style.

C. Directional Signage: Wall mounted Series 200A Sand carved, Helvetica letter style.

D. Directional Signage: Suspended post mounted Series 200A (double sided) Sand carved, Helvetica letter style.

2.03 COMPONENTS

A. Material: Approximately 1/8-inch thick melamine plastic laminate with contrasting core color. Melamine shall be non-staining, fire-retardant, self-extinguishing, and impervious to alkalis, alcohol, solvents, abrasives, boiling water and most acids.

B. Fasteners: 0.030-inch thick, double face tape shall be used on wall signs. Aluminum or stainless steel attachment shall be used on suspended double face directional signs.

C. Sizes are as indicated on sign schedule at the end of this Section.

2.04 BRAILLE AND TACTILE COPY: Comply with requirements of the Americans with Disabilities Act. Tactile copy to be raised 1/32-inch minimum from sign face. Glue-on or etched letters are not acceptable. Translation of copy into Braille shall be the responsibility of the manufacturer.

2.05 FINISHES – INTERIOR SIGNAGE

A. Colors: Selected from manufacturer’s standard.

B. Surface Texture: Matte.

2.06 FONT: Shall be Helvetica Medium, unless noted otherwise. Font and required symbol size shall be as indicated and meet ADA requirements.

2.07 BORDERS: Borders and corner keystones shall be provided on all signs as required. Borders shall be raised and finished to match raised letter finish.

PART 3 EXECUTION

3.01 EXAMINATION: 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 2 inches from strike side of doorframe and 60 inches high to center of sign from finish floor, typical unless indicated otherwise.

3.03 SCHEDULES

A. Sign Type 1: 7 inches wide by 9 inches high wall mounted restroom sign, with appropriate gender, wheelchair symbol and Braille. (MEN – 2 required; WOMEN – 2 required).

B. Sign Type 2: 36 inches wide by 6 inches high wall mounted restroom sign, with appropriate gender, both men & women, wheelchair symbol and no smoking symbol with "NO SMOKING" letters under the symbol. (RESTROOMS – 2 required).

C. Sign Type 3: 36 inches wide by 6 inches high suspended post mounted, double sided, restroom sign, with appropriate gender, both men & women, wheelchair symbol and directional arrow as required. (RESTROOMS – 4 required).

D. Sign Type 4: 36 inches wide by 6 inches high wall mounted informational sign, with 2 changeable insert panels. (INFORMATION – 0ne required). 12 inches wide by 2 inches high changeable insert panels. (8 a.m. – 5 p.m.; one required; 8 a.m. – 6 p.m.; one required).

E. Sign Type 5: 8 inches wide by 8 inches high wall mounted informational sign, with round hole cutout for button. (PRESS BUTTON FOR SECURITY OFFICER – one required; PRESS BUTTON FOR WEATHER INFORMATION – one required).

F. Sign Type 6: 24 inches wide by 6 inches high wall mounted informational sign, with appropriate symbol as required. (NO SMOKING – 2 required with symbol; NO PETS – 2 required with symbol; SECURITY – 3 required).

G. Sign Type 7: 12 inches wide by 6 inches high wall mounted informational sign. (EMPLOYEES ONLY – 1 required).

END OF SECTION

SECTION 10525 FIRE EXTINGUISHERS

PART 1 GENERAL

1.01 SECTION INCLUDES: Portable, multi-purpose, and dry-chemical fire extinguishers including accessories and mounting brackets.

1.02 SUBMITTALS: Submit manufacturer's technical data and installation instructions for all portable fire extinguishers required.

1.03 QUALITY ASSURANCE: 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. Local Supplier is West Architectural Specialties, Inc. Tel. (601) 982-1601.

B. Equivalent products by the following manufacturers are acceptable:
Amerex Corp., P.O. Box 81, Trussville, AL 35173. Tel. (205) 655-3271.
1. Larsen's Mfg. Co., 7421 Commerce Lane NE, Minneapolis, MN 55432. Tel. (612) 571-1181
3. Potter-Roemer, 3100 S. Susan St. Santa Ana, CA 92704. Tel. (800) 366-3473.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

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 Wall Mounting: Equal to J.L. Industries Cosmic 10E, UL rated 4A-60BC, 10 lb. nominal capacity.

2.03 MOUNTING BRACKETS: Provide manufacturer's standard bracket designed to prevent accidental dislodgment of extinguisher, of proper size for type and capacity of extinguisher indicated, in manufacturer's standard plated finish.

PART 3 EXECUTION

3.01 INSTALLATION: Install items included in this section in locations and at mounting heights indicated, or if not indicated, at heights and locations to comply with applicable regulations of governing authorities.

A. Securely fasten mounting brackets to structure, square and plumb, to comply with manufacturer's instructions.

B. 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. A minimum of two units are required if not indicated otherwise.

END OF SECTION

SECTION 10670 STORAGE SHELVING

PART 1 GENERAL

1.01 SECTION INCLUDES: Metal shelving at Existing Storage Building.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS: Submit manufacturer's technical product data and installation instructions.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Drawings and Specifications are based on products manufactured by Penco Products Inc., P.O. Box 378, Oaks, PA 19456. Tel. (610) 666-0500.

B. Equivalent products by the following manufacturers are acceptable:

1. Lyon Metal Products, P.O. Box 671, Aurora, IL 60507-0671. Tel. (603) 892-8941.
2. Stanley Storage Systems, P.O. Box 1151, Allentown, PA 18105-1151. Tel. (800) 523-9462.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 STORAGE SHELVING

A. Shelving Unit: Heavy Duty Hi-Performance open type prefinished metal shelving complete with hardware and end kit. Equal to Penco Model No. 1H7086, 48 inches wide, 18 inches deep, and 87 inches high with 6 shelves. Four units are required.

B. Color: Color to be selected from standard color chart by MDOT Architect.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units plumb and level, in locations and with mountings as shown or as directed by the Project Engineer.

B. Securely attach all components together in accordance with manufacturer's installation instructions.

C. Securely attach units to adjacent units and to wall or floor as required to not move or fall.

3.02 CLEANING AND PROTECTION: At completion of installation, clean surfaces in accordance with manufacturer's instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 10810 TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES: The extent of each type of toilet accessory is shown on the Drawings and Schedules, unless otherwise indicated. The type of toilet accessories required include the following:

1. Mirrors
2. Toilet Paper Dispenser
3. Grab Bars
4. Soap Dispensers
5. Paper Towel Dispenser
6. Clothes Hook
7. Mop Holder
8. Waste Receptacle
9. Diaper Changing Station
10. Hand Dryer
11. Toilet Seat Cover Dispenser
12. Napkin Disposal Unit

1.02 SUBMITTALS: Submit manufacturers product and technical data indicating compliance with these specifications and Shop Drawings for the fabrication and installation of all toilet accessories. Show all anchorage and other necessary items including mounting heights.

1.03 QUALITY ASSURANCE: Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same areas, unless otherwise acceptable to the MDOT Architect. Stamped names or labels on exposed faces of units will not be permitted, except where otherwise indicated.

1.04 DELIVERY, STORAGE AND HANDLING: Upon receipt of toilet accessories and other materials, installer shall examine the shipment for damage and completeness. Materials shall be stored in a clean, dry place. Stack all materials to prevent damage.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Equivalent products by the following manufacturers are acceptable:

1. A & J Washroom Accessories, 319 Temple Hill Road, New Windsor, NY 12553. Tel. (845) 562-3332.
2. American Specialties, Inc., 441 Saw Mill River Road, Yonkers, NY 10701. Tel. (914) 476-9000.
3. Bobrick Washroom Equipment, Inc., 225 Bobrick Drive, Jackson, TN 38301. Tel. (901) 424-7000.
4. Bradley Washroom Accessories Division, P.O. Box 309, Menomonee Falls, WI 53051. Tel. (414) 354-0100.
5. Kimberly-Clark Corp., 1400 Holcomb Bridge Road, Roswell, GA 30076. Tel. (888) 346-4652.
6. Koala Corp., 11600E. 53rd Avenue, Unit D, Denver, CO 80239. Tel. (800) 985-6252.
7. World Dryer, 5700 McDormott Drive, Berkeley, IL 60163. Tel. (800) 323-0701.

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 ACCESSORIES

A. Mirrors: Provide 1/4 inch polished plate glass, electrolytically plated mirrors with 1/2 inch stainless steel channel frame. Mirrors shall be 24 inches by 36 inches equal to Bradley model 780-2436. Locate at each toilet lavatory mounted in locations shown.

B. Toilet Paper Dispenser: Provide surface mounted stainless steel jumbo-roll toilet tissue dispenser with top-mounted key lock, hinged front cover, large product view lens and plastic tear-off bars on sides and front dispensing opening equal to Kimberly-Clark model 09564. Locate at each toilet in public toilet rooms.

C. Grab Bars: Provide 1-1/2 inches diameter horizontal 2 wall stainless steel grab bars with safety-grip non-slip finish and concealed mounting equal to Bradley model 8122-059, 36 inches by 52 inches standard dimensions. Locate at toilets where indicated at heights shown. Contractor has option to use one 36-inch grab bar and one 42-inch grab bar, but installation must meet all ADA requirements.

D. Soap Dispensers: Provide surface mounted liquid type stainless steel soap dispenser units equal to Bradley model 6542. Locate at sink in Office.

E. Paper Towel Dispenser: Provide surface mounted stainless steel paper towel dispensers equal to Bradley model 250-15. Locate at sink in Office.

F. Clothes Hook: Provide surface mounted stainless steel hook equal to Bradley model 9135 at each Toilet Room, unless coat hooks are provided with toilet partition doors.

G. Mop Holder: Provide surfaced mounted stainless steel mop and broom holder equal to Bradley model 9933. One piece construction with welded gusset and hooks. Holder consist of spring activated rubber cams on plated steel retainers. Unit measures 14 inches high by 34 inches long, with 4 hooks and 3 holders. Shelf projects 8 inches. Locate at each service sink where shown and at height shown or if not shown then per Project Engineer's instructions.

H. Waste Receptacle: Provide surfaced mounted stainless steel waste receptacle with hinged cover equal to Bradley model 356-35. Include removable heavy-duty polyvinyl liner model P11-006. Locate in Public Toilet Rooms where shown and at height shown.

I. Diaper Changing Station: Provide surfaced mounted, folding, high density polyethylene units with full length steel hinge mechanism and molded-in liner dispensers and bag hooks equal to Bradley model 960. Locate in Public Toilet Rooms where shown and at height shown.

J. Hand Dryer: Provide surface mounted hand dryer equal to Bradley model 2870-28. Hand dryer shall be fabricated from porcelain enameled grey cast iron fitted with fixed nozzle and infrared electronic control. Universal type motor, 1/10 HP at 7500 RPM with resilient ring mounts and sealed, lubricated ball bearings. Protected by 2-amp fuse. 115volt, 20 amp, 60 Hz. Entire unit shall be UL listed and guaranteed against defects in material and/or workmanship for 10 years. Locate in Public Toilet Rooms where shown and at heights shown.

K. Toilet Seat Cover Dispenser: Provide surface mounted stainless steel toilet seat cover dispenser with full length piano hinge, tumbler lock and 500 capacity standard single-fold or half-fold toilet seat covers equal to Bradley model 583. Locate at each toilet in Public Toilet Rooms.

L. Napkin Disposal Unit: Provide surface mounted stainless steel napkin disposal unit with hinged cover and bottom with lock, equal to Bradley model 4781-15. Include disposable wet strength paper liner. Locate at each toilet in Women's Toilet Room.

PART 3 EXECUTION

3.01 EXAMINATION: Installer shall examine the areas and conditions under which toilet 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 INSTALLATION

A. Use concealed fastenings wherever possible. Provide anchors, bolts and other necessary anchorage, and attach accessories securely to walls and partitions in locations as shown or directed. Install concealed mounting devices and fasteners fabricated of the same material as the accessories, or of galvanized steel, as recommended by manufacturer.

B. Install exposed mounting devices and fasteners finished to match the accessories. Provide theft-resistant fasteners for all accessory mountings. Secure toilet room accessories in accordance with the manufacturer's instructions for each item and each type of substrate construction.

C. Installation shall meet all ADA requirements including proper mounting heights.

END OF SECTION

SECTION 11455 RESIDENTIAL APPLIANCES AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES: Residential appliances as shown on the Drawings and as specified herein.

1.02 SUBMITTALS: 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, 9500 Williamsburg Office Plaza, Louisville, KY 40222. Tel. (800) 626-2000.
2. Magic Chef Co., 740 King Edward Avenue, Cleveland, TN 37311. Tel. (423) 472-3371.
3. Manitowoc Ice,Inc., 21105 26TH Street, Manitowoc, WI 54220. Tel. (800) 545-5720.
4. Scotsman Ice System, 775 Corporate Woods Parkway, Vernon Hills, IL 60061. Tel. (847) 215-4500.
5. Sears Contract Sales, 3333 Beverly Road, Hoffman Estates, IL 60179. Tel. (847) 286-2994.
6. Randell Manufacturing, Inc.,520 S. Coldwater Road, Weidman, MI 48893. Tel. (800) 621-8560.

B. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 ELECTRIC COOK TOP: Electric cook top equal to GE Model JP202DWW.

2.03 REFRIGERATOR: 4.3 cu. ft. capacity, under-counter type equal to GE Model GMR04AAMWW with reversible door, White.

2.04 MICROWAVE: 1.4 cu. ft. oven cavity, 950 watts, over-the-range vented type, equal to GE Model JVM 1441WD with Re-circulating Charcoal Filter Kit Model JX81A, White.

2.05 ICE MACHINE: Existing unit to be relocated as shown on Drawings.

2.06 ICE BIN: Equal to Model 9500IC by Randell Manufacturing, Inc. Size 23 inches by 17 7/8 inches. Top to be one piece of die-stamped 20 gauge stainless steel with removable stainless steel cover. Stainless steel ice bin liner with coved corners and 1 inch drain. Foamed in place polyurethane insulation, 60 lb. ice capacity. Corrosion resistant outer body.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units plumb and level, in locations and with mountings as shown. 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. Modify swing of refrigerator doors to open toward adjacent base cabinets.

D. Verify and provide all plumbing and electrical hook-ups and electrical outlets required by the appliances specified prior to rough-in.

3.02 CLEANING AND PROTECTION: At completion of installation, clean surfaces in accordance with manufacturer's instructions...Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 12485 FLOOR MATS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal-rails, tapered vinyl-frame, surface mounted, removable, carpeted floor mats for Building Entrances.

B. Tapered vinyl-frame, surface mounted, carpet floor mats for Reception Area and Office.

1.02 RELATED SECTIONS: Section 09050 – Color Design.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's 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., 151 Fifth Ave. NW, Suite J, Saint Paul, MN 55112-3268. Tel. (651) 631-1607.
2. Balco / Metalines, P.O. Box 17249, Wichita, KS 67217. Tel. (316) 945-9328.
3. R. C. Musson Rubber Co., P.O. Box 7038, Akron, OH 44306. Tel. (330) 773-7651.

C. Substitutions shall fully comply with specified requirements and Section 01630-Product Options and Substitution Procedures.

2.02 METAL-FRAMED FLOOR MATS; Equal to C/S “Pedimat” Surface-Mounted Floor Mat, Model M1-D-CP-SM.

A. Size: 5’-0” wide by 4’-0” deep (traffic direction).

B. Carpet Color: As selected by MDOT Architect from full range of standard colors.

C. Rails: Extruded aluminum 6063-T52 as selected by MDOT Architect from full range of standard colors

D. Carpet tread: Colorfast, solution dyed 100% nylon tread, in color selected, fusion bonded to rigid two-ply backing. Carpet fiber shall contain an antimicrobial additive and “Scotchgard” soil reducing treatment.

E. Tapered vinyl with mitered corners and color to match rails.

2.03 CARPET FLOOR MAT: Equal to C/S Carpet Mat, Model PWPT-C-M-907.

A. Size: See Drawings for shape and size. Field verify dimensions, adjust size to fit space. Notch at corners as required.

B. Carpet Color: As selected by MDOT Architect from full range of standard colors.

C. Carpet: Mildew resistant, 100% Hi-UV heavy denier polypropylene fibers with a face weight of 50 oz. Supply with cushioned polyurethane backing.

PART 3 EXECUTION

3.01 INSTALLATION: Install units’ level, in locations as shown or described. Install mats after Final Cleaning of Project Floor.

3.02 CLEANING AND PROTECTION: At completion of installation, clean surfaces in accordance with manufacturer’s instructions. Protect units from damage until acceptance by Owner.

END OF SECTION

SECTION 15010 BASIC MECHANICAL REQUIREMENTS

PART 1 GENERAL

1.01 INSTRUCTIONS

A. This Contractor shall provide all items, articles, materials, operations or methods listed, mentioned or scheduled on the drawings, and/or herein, including all labor, materials, equipment and incidental necessary, required, or implied, for installation of complete air conditioning ventilating, heating, and plumbing systems as specified herein and as shown on the drawings.

B. The General Conditions, Information to Bidders, Special Conditions, and other pertinent documents issued by the Architect are a part of the Contract Documents and shall be complied with in every respect.

C. This Contractor shall examine the general construction drawings, the structural drawings and the electrical drawings, and lay out his work accordingly to avoid conflict.

D. This Contractor shall visit the site in order to familiarize himself with existing working conditions. Failure to do so shall not relieve contractor of responsibility of making changes required by conditions encountered on site.

1.02 LOCAL SITE CONDITIONS

A. Before bidding, make complete investigation at Site in order to be informed as to location of utilities and as to conditions under which work is to be performed. Utility locations shown were obtained from surveys and/or local utility companies and are not to be assumed as being accurate.

B. Make determination of soil conditions before bidding. These specifications and accompanying drawings in no way imply as to condition of soil to be encountered.

1.03 CLEAN UP

A. Do not allow waste material or rubbish to accumulate in or about job site.

B. At completion of work, remove all rubbish, tools, scaffolding and surplus materials from and about building, leaving work clean and ready for use without further cleaning required. Clean all equipment, piping, valves, fixtures, and fittings of grease, metal cuttings, insulation cement, dust, dirt, paper labels, etc.

C. Any discoloration or other damage to parts of building, its finish or furnishings due to failure to properly clean or keep clean mechanical systems shall be repaired without cost to Owner.

1.04 DRAWINGS

A. The drawings indicate the extent and general arrangement of the various systems. If any departure from these drawings is necessary, descriptions of these departures and a statement of the reasons therefore shall be submitted to the Architect for approval.

B. These drawings and specifications shall be considered a part of this contract. Should an error or omission occur in either or both the drawings and specifications, or conflict one with the other, this Contractor shall not avail himself of such unintentional error, omission or conflict, but shall have same explained to him and adjusted before signing the contract or proceeding with the work.

PART 2 PRODUCTS

2.01 COORDINATION: The products of particular manufacturers have been used as the basis of design in preparation of these documents. Any modifications to the mechanical systems and their components, the electrical systems, the building structure and architecture, or any other portion of the building that result from the use of any other than the basis of design equipment shall be coordinated with all other trades. Such coordination shall occur before delivery of products from the manufacturer (before shop drawing submittals) and shall be clearly indicated on the shop drawings. Any related modifications shall be performed without any additional cost to the contract.

2.02 DESCRIPTION: All products shall be new and bear the Underwriter's Laboratories, Inc., (UL) label unless specifically indicated otherwise.

PART 3 EXECUTION

3.01 GENERAL

A. The mechanical plans do <u>not</u> give exact elevations or locations of lines, nor do they <u>show</u> all the offsets, control lines, or other installation details. The Contractor shall carefully lay out his work at the site to conform to the structural conditions, to provide proper grading of lines, to avoid all obstructions, to conform to details of installation supplied by the manufacturers of the equipment to be installed, and to thereby provide an integrated, coordinated and satisfactory operating installation.

B. If the Contractor proposes to install equipment, including piping and ductwork, requiring space conditions other than those shown, or to rearrange the equipment, he shall assume full responsibility for the rearrangement of the space and shall have the Architect review the change before proceeding with the work. The request for such changes shall be accomplished by Shop Drawings of the space in question.

C. The Contractor is responsible for the proper location and size of all slots, holes or openings, in the building structure pertaining to his work, and for the correct location of sleeves, inserts, cores, etc.

3.02 EQUIPMENT CONNECTIONS

A. Each equipment item with drain connections, shall be provided with a properly-sized drain, with trap and clean-out, run to the nearest floor drain or as directed.

B. Rough-in and make final connection to all equipment requiring same, furnished under other divisions of these specifications or by the Owner.

1. Provide necessary labor and materials, including stop valves, traps, pressure-reducing valves, etc. where necessary. Trap and vent drainage connections as required.

2. If equipment or fixtures to be furnished by Owner and/or Owner's vendor are not delivered prior to final acceptance, services shall be capped or plugged at walls or floor as directed, ready for future connection.

C. No equipment or fixture shall be "roughed-in" until proper rough-in drawings are in the hands of the trade doing the work.

3.03 PROTECTION OF EQUIPMENT

A. Responsibility for care and protection of equipment and material under this Contract rests with this Contractor until equipment or materials have been installed, tested and accepted.

B. Store equipment, including pipe and valves, off the ground and under cover. For storage outdoors, minimum 4 mil thick plastic shall be fitted to withstand splattering, ground water, precipitation and wind.

C. All pipe ends, valves, and parts of equipment left unconnected permanently or temporarily, shall be capped, plugged or properly protected to prevent entry of foreign matter.

D. Protect air handling unit coils by use of protective sheet metal panels or plywood.

E. Plug ends of pipe when work is stopped and close ends of ducts with plastic taped in place until work resumes.

F. Damaged equipment shall be repaired or replaced at the option of the Architect/Engineer.

3.04 PAINTING

A. Factory painted equipment that has been scratched or marred shall be repainted to match original factory color.

B. All uninsulated black ferrous metal items exposed to sight inside the building, such as gas piping, equipment hangers and supports not provided with factory prime coat, shall be cleaned and painted with one coat of zinc chromate primer. In addition, such items in finished spaces shall also be painted with two coats of finish paint in a color to match adjacent surfaces or as otherwise selected by the Architect.

C. Black ferrous metal items exposed outside the building, such as equipment support beams, uninsulated pipe and pipe supports not provided with factory prime coat, shall be cleaned and painted with one coat of rust inhibiting primer and two coats of an asphaltic base aluminum paint. Insulated pipes outside the building shall be cleaned and painted with one coat of rust inhibiting primer before installing insulation.

D. In lieu of painting hanger rods, cadmium plated or galvanized rods may be furnished.

E. No nameplates or equipment shall be painted, and suitable protection shall be afforded to the plates to prevent their being rendered illegible during the painting operation.

F. Galvanizing broken during construction shall be recoated with cold galvanizing compound.

G. All ductwork, piping, insulation, conduit or other appurtenances visible through grilles and diffusers shall be painted flat black.

3.05 PROTECTION OF EXISTING UTILITIES

A. The Contractor shall use extreme caution during excavation operations not to damage or otherwise interrupt the operations of existing utilities. The Contractor shall be responsible for the continuous operation of these lines and shall provide bypasses or install such shoring, bracing, or underpinning as may be required for proper protection.

B. Obtain approval from the Architect at least 7 days prior to connecting to any utility line and coordinate with the appropriate utility company.

3.06 CUTTING AND PATCHING

A. The Contractor shall assume all cost of, and be responsible for, arranging for all cutting and patching required to complete the installation of his portion of the work. All cutting shall be carefully and neatly done so as not to damage or cut away more than is necessary of any existing portions of the structure.

B. All patching will be done by workmen skilled in the trade required.

C. The Contractor shall make suitable provisions for adequately water-proofing at all floor penetrations of water proof membrane floors. This shall include but not be limited to floor drains, open sight drains, hub drains, cleanouts, and sleeves for the various piping. This also applies to membrane roofing systems.

3.07 ACCESS PANELS

A. Provide access panels as required or as indicated to service valves in piping, controls, items in duct, etc.

B. Access doors shall be provided under this section of the specifications and furnished to the General Contractor to be installed.

C. Access doors shall be equal to the following MILCOR types as manufactured by Inryco, Inc.:

1. Style AT Door for Acoustical Tile Ceilings
2. Style AP Door for Acoustical Plaster Ceilings
3. Style K Door for Plastered Wall and Ceiling Surfaces
4. Style DW Door for Drywall
5. Style ATR for Suspended Drywall Ceilings
6. Style M Door for Masonry, Ceramic Tile, Etc.
7. Fire-Rated 1-1/2 hr. (B-label) Door where required.

D. Size and type shall be as required for proper service and/or as may be directed by the Architect.

E. Access doors installed in firewalls or partitions shall be U.L. labeled to maintain the fire rating at the wall or partition.

3.08 ESCUTCHEONS

A. Escutcheons shall be installed on all pipes where they pass through floors, ceilings, walls, or partitions in finished areas.

B. The interior of closets and equipment rooms adjacent to finished areas, shall be considered as finished for the intent of these specifications.

C. Escutcheons shall be split, hinged, stamped brass type designed to fit the pipe, and to cover the terminating pipe sleeve, in chrome plated finish unless otherwise specified, with securing device to hold the escutcheon tight to the pipe.

3.09 EQUIPMENT, MATERIALS AND BID BASIS

A. It is the intention of these specifications to indicate a standard of quality for all material incorporated in this work. Manufacturer's names are used to designate the item of equipment or material as a means of establishing grade, size and quality. Where several manufacturers are named, only these manufacturers' products will be considered and the Contractor's bid shall be based on their products. Other named manufacturers, although acceptable as manufacturers, must prove their product will perform satisfactorily and will meet space requirements, etc., before submitting shop drawings, when their equipment achieves the required results in a manner different than that of the first named manufacturer. Where only one manufacturer is named, unless the specifications state otherwise, manufacturers of similar quality products will be considered. Such unnamed manufacturer's products will, however, be considered as substitutions and shall not be used as a basis for bidding. In the event the Contractor wishes to submit substitutions to the Architect for review prior to bid, he shall furnish descriptive catalog material, text data, samples, etc., as well as any other pertinent data necessary to demonstrate that the proposed substitutions are acceptable equals to the specified product. No substitutions shall be made without the written consent of the Architect.

B. The use of one named manufacturer in the schedules on the drawings is for guide purposes. The provisions of the above paragraph will govern in the selection of products to be used.

3.10 FOUNDATIONS: All concrete foundations required by equipment furnished under the Mechanical Division shall be constructed in conformance with the recommendations of the manufacturer of the respective equipment actually applied, and with the approval of the Architect. All corners of the foundations shall be neatly chamfered. Foundation bolts shall be placed in the forms when the concrete is poured. Allow one inch (1") below the equipment bases for alignment, leveling and grouting with non-shrinking grout. Grouting shall be done after the equipment is leveled in place. After the grout has hardened, the foundation bolts shall be pulled up tight and the equipment shimmed, if necessary. After removal of the forms the surface of the foundation shall be rubbed. Unless otherwise noted, foundations shall be six inches (6") high. All concrete work performed shall conform entirely to the requirements of the General Specifications which describe this class of work.

3.11 RECORDS AND INSTRUCTIONS FOR OWNER

A. The Contractor shall accumulate during the job's progress the following data in quintuplicate prepared in neat brochures or packet folders and turned over to the Architect/Engineer for check and subsequent delivery to the Owner:

1. All warranties and guarantees and manufacturer's directions on equipment and material covered by the Contractor.
2. Approved fixture brochures, wiring diagrams, and control diagrams.
3. Original and copies of approved shop drawings.
4. Any data and/or drawings required during construction.
5. Repair parts lists of all major items and equipment including name, address, and telephone number of local supplier or agent.
6. HVAC systems Test and Balance Report

B. All of the above data shall be submitted to the Architect/Engineer for approval at such time as the Contractor asks for his last request for payment prior to his final request for payment, but in no case, less than two weeks before final inspection.

3.12 OPERATING AND MAINTENANCE INSTRUCTIONS

A. Description

1. Complete operating and maintenance instructions shall be provided to the Owner. Two (2) separate copies (three for the Owner, one for the Architect) shall be provided, and each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each system, and shall include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instructions shall be included for each piece of equipment. Operating instructions shall include recommended periodic maintenance and seasonal changeover procedures, and suggested procedures in operation of all systems to promote energy conservation. These instructions must be written expressly for this project and shall refer to equipment, valves, etc. by mark number from project schedules. Operating instructions and procedures shall be submitted in draft form for approval prior to final issue of complete brochures. Manufacturer's advertising literature or catalogs will not be acceptable for operating and maintenance instructions. Manufacturers' Standard literature is acceptable for each piece of equipment. However, the Contractor shall prepare a SYSTEM O&M manual including overall system descriptions, operating and energy conservation techniques.

2. A system wiring and control diagram shall be included in the operating and maintenance instructions.

3. Prior to final acceptance or beneficial occupancy, provide the services of a competent representative to instruct and train the Owner in the operation of all systems. This instruction shall include a complete walk-through of all equipment and systems. The Architect reserves the right to attend any such meeting and shall be duly notified. Where specified, certain major items of equipment shall be installed under the supervision of and tested by a specialist furnished by the manufacturer of the equipment. Such specialist shall train the operator in the use of his equipment.

4. A competent technician employed by the Temperature Control Subcontractor shall be required to instruct the Owner in proper operating procedures and shall explain the significance of the temperature control literature filed in the maintenance manual while the system is in continuous operation as specified above.

5. Printed instructions, installed in a suitable frame with a glass front, covering the operation and maintenance of each major item of equipment, shall be posted at locations designated by the Architect. Provide two bound manuals containing complete repair parts lists, and operating service and maintenance instructions for all equipment provided.

3.13 RECORD SET DRAWINGS

A. The Contractor shall maintain on a daily basis at the project site a complete set of "Record Drawings" reflecting an accurate dimensional record of all buried or concealed work. In addition, the "Record Drawings" shall be marked to show the precise location of concealed work and equipment, including concealed or embedded piping and valves and all changes and deviations in the Mechanical work from that shown on the Contract Documents. This requirement shall not be construed as authorization for the Contractor to make changes in the layout or work without definite instructions from the Architect. The "Record Drawings" shall consist of a set of mylar sepia prints of the Contract Drawings for this Division with the Engineer's seal and Engineer's firm name removed or blacked out. Prior to commencing work the Contractor shall purchase from the Architect a set of mylar sepia prints to be used for the "Record Drawings".

B. Record dimensions shall clearly and accurately delineate the work as installed; locations shall be suitably identified by at least two (2) dimensions to permanent structures.

C. The Contractor shall mark all "Record Drawings" on the front lower right hand corner with a rubber stamp impression that states the following:

> "RECORD DRAWINGS (3/8" high letters) to be used for recording Field Deviations and Dimensional Data Only" (5/16" high letters)

3.14 GUARANTY-WARRANTY

A. This guarantee shall include capacity and integrated performance of component parts of various systems in strict accord with the true intent and purpose of these Specifications.

Conduct such tests as herein specified or as may be required by the Architect to demonstrate capacity and performance ability of various systems to maintain specified conditions.

B. All materials and equipment shall carry a full year's warranty from time Owner accepts building or the date of substantial completion, whichever is earlier, regardless of start-up date of equipment, unless a longer warranty period is specified under other sections.

3.15 INSTALLATION: All equipment shall be installed in strict conformance with manufacturer's recommendations, as specified herein and as shown. If any conflict arises between these instructions, notify the Engineer immediately for guidance.

3.16 FLAME SPREAD AND SMOKE DEVELOPED PROPERTIES OF MATERIALS

A. Materials and adhesives used throughout the mechanical and electrical systems for insulation, and jackets or coverings of any kind, or for piping or conduit system components, shall have a flamespread rating not over 25 without evidence of continued combustion and with a smoke developed rating of not higher than 50. If such materials are to be applied with adhesives, they shall be tested as applied with such adhesives, or the adhesives used shall have a flamespread rating not over 25 and a smoke developed rating not higher than 50. (Note: Materials need not meet these requirements where they are entirely located outside of a building and do not penetrate a wall or roof, and do not create an exposure hazard.)

B. "Flame-Spread Rating" and "Smoke Developed Rating" shall be as determined by the "Method of Test of Surface Burning Characteristics of Building Materials, NFPA No. 255, ASTM E84, Underwriter's Laboratories Inc., Standard". Such materials are listed in the Underwriters' Laboratories, Inc., "Building Materials List" under the heading "Hazard Classification (Fire)".

3.17 EQUIPMENT FURNISHED BY OWNER

A. The Contractor shall unload, uncrate, assemble, and connect any and all equipment shown on the drawings or called out in the Specifications to be furnished by the Owner for installation by the Contractor.

B. The Contractor shall take full charge of such equipment from the time the items are delivered to the job, set in place, connected, tested, adjusted, and placed into operation.

3.18 HAZARDOUS MATERIALS

A. No products shall be used that contain any known hazardous or carcinogenic materials. Products with asbestos or radioactive content shall not be used.

B. Handling of any hazardous material is not covered in this specification Division (15). Any requirements for such are beyond the scope of this contract and shall be done only by those persons contracted to do so.

3.19 ELECTRICAL WORK

A. All electrical equipment provided under this division shall comply with the electrical system characteristics indicated on the electrical drawings and specified in Division 16.

B. All components shall be in conformance with the requirements of the National Electrical Code and Division 16. Motor starters and disconnects as required for rooftop units, and fans provided under this division shall be furnished under Division 15.

C. All power wiring and final power connections to the system shall be provided under Division 16.

D. Control wiring (120V. and less) shall be provided under Division 15 and extended from the 120V. power circuits indicated on the electrical drawings. All wiring for voltages higher than 30 volts shall be done by a licensed electrician.

E. All electrical characteristics shall be taken from the mechanical and electrical drawings and specifications and coordinated before equipment is ordered or submitted.

3.20 MOTORS

A. Unless specifically noted otherwise in other sections of this specification, all motors and motor controllers shall meet the requirements specified in this section. All motors shall be built in accordance with the current applicable IEEE, and NEMA standards and shall have voltage, phase, frequency and service as scheduled.

B. Each motor shall be suitable for the brake horsepower of the driven unit, rated with 1.15 minimum service factor, and shall be NEMA design B. The motor temperature rise shall not exceed 40 degrees C. for drip proof motors, 50 degrees C. for splash proof motors, and 55 degrees C. for totally enclosed or explosion proof motors. The motor shall be capable of operating continuously at such temperature rises, and shall be capable of withstanding momentary overloads of 25 percent without injurious overheating.

C. Each item of motor driven equipment shall be furnished complete with the motors and drives as required to perform the specific function for which it is intended, scheduled, and specified.

D. Motors shall be ball bearing type selected for quiet operation and shall be manufactured for general purpose duty unless otherwise indicated. Each bearing shall be accessible for lubrication, where necessary, and designed for the load imposed by the V-belt drive or the driven apparatus. Direct drive motors shall be designed for the specific application with all necessary thrust bearings, shaft capacities, etc.

E. Motors larger than 1/2 horsepower shall be of U.S. manufacture and have bearings with pressure grease lubrication fittings.

F. Motors connected to drive equipment by belt shall be furnished with adjustable slide rail bases except for fractional horsepower motors which shall have slotted bases. Motor leads shall be permanently identified and supplied with connectors.

G. Each motor to be installed outdoors shall be of the totally-enclosed fan-cooled type, or housed in a weatherproof housing.

H. Unless otherwise indicated, motors smaller than 1/2 horsepower shall be capacitor start or split phase type designed for 120 volt, single phase, 60 cycle alternating current. Shaded pole motors are not to be acceptable except 35 watts and smaller. Motors 1/2 horsepower and larger shall be squirrel cage induction type, 3 phase, 60 cycle alternating current.

I. If the Contractor proposes to furnish motors varying in horsepower and/or characteristics from those specified, he shall first inform the Architect/Engineer of the change and shall then coordinate the change and shall pay all additional charges in connection with the change.

END OF SECTION

SECTION 15011 SCHEDULE OF SUBMITTAL DATA

PART 1 GENERAL

1.01 RELATED DOCUMENTS: The requirements of the General Conditions, Supplementary Conditions, and Section 15010 apply to all work herein.

1.02 QUALITY ASSURANCE:

A. Shop drawings or fully descriptive catalog data shall be submitted by the Contractor for all items of material and equipment furnished and installed under this contract. The Contractor shall submit to the Architect a sufficient number of copies of all such Shop Drawings or catalog data to provide him with as many reviewed copies as he may need, plus two (2) copies for retention; one by the Architect and one by the Engineer.

B. Before submitting Shop Drawings to the Architect for review, the Contractor shall examine them and satisfy himself that they are correctly representative of the material or equipment to which they pertain. The Contractor shall so note these Drawings before submitting them. The Contractor's review of the Shop Drawings is not intended to take the place, in any way, of the official review of the Architect, and Shop Drawings which have not been reviewed by the Architect shall not be used in fabricating or installing any work.

C. The review of Shop Drawings or catalog data by the Architect shall not relieve the Contractor from responsibility for deviations from the Plans and Specification unless he has, in writing, specifically called attention to such deviations at the time of submission and has obtained the permission of the Architect thereon; nor shall it relieve him from responsibility for error of any kind in Shop Drawings. When the contractor does call such deviations to the attention of the Architect, he shall state in his letter whether or not such deviations involve any extra cost. If this is not mentioned, it will be assumed that no extra cost is involved for making the change.

D. Verification and assignment of dimensions, quantities, and construction means, methods, sequences or procedures, the correctness of which is set forth in the Contract Documents or submittal, shall be the sole responsibility of the Contractor.

E. Reproduction of design documents in any portion for use in a submittal is not acceptable.

PART 2 PRODUCTS

2.01 GENERAL: All products shall be new and bear all labels which are identified by the applicable specification section and Contract Documents.

PART 3 EXECUTION

3.01 SUBMITTAL DATA:

A. General

1. The submittal data to be furnished for this project shall comply with the Specifications and Contract Documents in their entirety. Any submittals herein scheduled are as a minimum only and shall not be construed to limit the submittal data required within the individual Sections of these Specifications.

2. Shop Drawings will be returned unchecked unless the following information is included: Reference to all pertinent data in the Specifications or on the Drawings, such as sound power levels of motor driven equipment where called for in the specifications, electrical characteristics and horse power, capacities, construction material of equipment, UL labels where required, accessories specified, manufacturer, make and model number, weights where specified, starters where required by Division 15, size and characteristics of the equipment, name of the project and a space large enough to accept an approval stamp. The date submitted shall reflect the actual equipment performance under the specified conditions and shall not be a copy of the scheduled data on the drawings. All submitted equipment must be identified on Shop Drawings with same "Mark Numbers" as identified on Drawings or in Specifications. All pertinent data such as accessories shall also be marked. Any deviation from any part of the Contract Documents shall be clearly and completely highlighted.

3. HVAC and plumbing submittal data shall be bound into separate HVAC and plumbing volumes, with each volume containing one copy of all specified equipment shop drawings. The binders shall be provided with an identification tab for each Specification Section that requires submittals. Each item in each tabbed section shall be identified with the paragraph number relating to the item submitted the use of a cover sheet or by highlighting the paragraph on the first page concerning the item. If necessary, binders shall be resubmitted with the original submittal date and will address and resolve all comments thereon. All submittals shall include identification tabs and sufficient space for all submittal data. FAILURE to provide **BOUND AND IDENTIFIED SUBMITTALS** will result in the **AUTOMATIC REJECTION** of the submittal data with **NO EXCEPTION.**

B. The bound submittals are to be submitted for review within 30 days after the Contract is awarded. No submittal will be checked until ALL required submittals have been received by the Engineer. Only Automatic Temperature Controls, ductwork and piping fabrication drawings may be submitted after the completed bound submittal is reviewed and accepted by the Engineer.

C. The Contractor shall submit with the bound and identified submittal data a letter signed by the Contractor's Project Manager (or higher level officer of the firm) stating that all electrical characteristics of the mechanical equipment to be supplied have been fully coordinated with the electrical contractor. No submittal data will be checked until this letter is submitted. Any changes to the electrical requirements from the Contract Documents resulting from alternate equipment being submitted shall be performed without any additions to the Contract Sum. Shop Drawings shall be submitted for each of the following:

Submit attachment and fastening methods for piping and equipment to the Structural Engineer for approval.

Automatic Temperature Controls
Cleanouts
Disconnect Switches
Ductwork Accessories and Details (min. 1/4"=1'0" scale)
DX Split Systems
Fans
Grilles, Registers and Diffusers
Indoor Heat Pumps
Insulation
Outdoor Heat Pumps
Plumbing Drains
Plumbing Fixtures, Carriers and Fittings

Refrigerant Piping Diagrams and Layouts approved by the compressor Manufacturer
Test, Adjusting and Balancing Reports and Forms
Valves
Water Heaters

D. The Contractor shall submit three copies of a letter, signed by an officer of the company, that the items listed below meet or exceed criterion of the plans and specifications. The letter is to include a list of each item to be used on the project along with the manufacturer.

Flexible Duct
Flexible Connectors
Ductwork Access Doors and Panels
Vacuum Breakers
Filters
Dampers
Water Supplies and Stops
Pipe Hangers and Supports
Hydrants
Shock Absorbers

3.02 OPERATING AND MAINTENANCE INSTRUCTIONS:

A. Description

1. Complete operating and maintenance instructions shall be provided to the Owner. Two (2) separate copies shall be provided, and each copy shall be bound in a separate 3-ring, loose leaf notebook. Operating instructions shall be provided for each system, and shall include a brief system description, a simple schematic and a sequence of operation. Operating and maintenance instruction shall be included for each piece of equipment. Manufacturers' Standard literature is acceptable for each piece of equipment. However, the contractor shall prepare a SYSTEM O&M manual including overall system descriptions, operating and energy conservation techniques.

2. A system wiring and control diagram shall be included in the operating and maintenance instruction.

3. Prior to final acceptance or beneficial occupancy, provide the services of a competent representative to instruct the Owner in the operation of all systems. This instruction shall include a complete walk-through of all equipment and systems. The Architect reserves the right to attend any such meeting and shall be duly notified.

3.03 OTHER SUBMITTALS:

A. Submit or provide the following prior to occupancy of the project by the Owner.

1. As built drawings for ductwork, HVAC piping, and plumbing systems.

2. All guarantees.

3. Submit two (2) copies of welders certificate.

4. Certify disinfection of domestic water service.

5. Manufacturer's representative shall certify that HVAC equipment and valves are installed in accordance with the manufacturer's recommendations.

END OF SECTION

SECTION 15020 IDENTIFICATION OF PIPING SYSTEMS

PART 1 GENERAL

1.01 APPLICABILITY

A. All work specified in this Section shall comply with the general provisions.

B. All above ground piping inside the building shall be identified with color bands at each shut-off valve, each piece of equipment, each branch take-off, and 40'-0" maximum spacing on exposed straight pipe runs.

C. All underground plastic water and sewer piping outside the building shall have #14-copper TW tracer wire attached to pipe. Install directly above pipe a continuous 6-inch wide vinyl plastic tape with printing identifying buried service, 12 inches below finished grade, during backfilling operation.

PART 2 PRODUCTS

2.01 PIPE MARKINGS

A Manufactured snap on preprinted markings as manufactured by W. H. Brady Co., MSI Services, Inc., Craftmark Identification Systems, or approved equal shall be used in accordance with the following:

1. No tape or self-adhering markers will be allowed.

2. Snap on pipe markers are acceptable.

3. Markers shall be strapped on with nylon fasteners.

4. Markers will be non-corrosive, non-conductive, mildew resistant and impervious to moisture.

2.02 BAND AND LETTER SIZE

A. Band and letter sizes shall conform to ASHRAE standards of the following table:

O.D. of Pipe Covering	Width of Color Band	Size of Letter/Numbers
1-1/4" and smaller	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"
6" to 10"	24"	2-1/2"
over 10"	32"	3-1/2"

2.03 IDENTIFICATION

A. Band legend and color and letter color shall conform to the following table:

Piping Band	Legend	Letters	Band	Color
Cold Water (Domestic)	CW	CW (Dom)	Black	Green
Hot Water (Domestic)	HW	HW (Dom)	Black	Yellow
Drain	DRAIN	DRAIN	Black	Green

PART 3 EXECUTION

3.01 EXECUTION

A. Locate pipe identification in the following areas:

1. Each riser.

2. Each valve.

3. One each side where piping passes thru walls and floors.

4. At each change in direction or height.

5. Every 40 feet along continuous runs.

6. Within 4 feet of exit or entrance to vessel or tank.

B. Indicate pipe content flow direction with arrows of matching style and placed so the arrow points away from the legend.

C. Manufactured preprinted markers shall be attached to the piping with self-locking nylon fasteners.

END OF SECTION

SECTION 15025 MOTOR CONTROLS AND WIRING

PART 1 GENERAL

1.01 SCOPE

A. All electrical work specified in this Section shall comply with the provisions of Division 16.

B. All motors shall be provided.

C. A motor starter shall be provided under this Section for each motor including package units which shall be furnished with integral starters. Motor starters shall be installed either in a Motor Control Center or separately mounted adjacent to the motor served as shown, indicated and/or required.

D. Motor power wiring is defined as those conductors between the energy source and the motor. This power wiring shall be terminated at motor terminals and will be provided under Division 16 work.

E. All control wiring required for automatic starting and stopping of motors shall be provided under this Division unless specifically shown on the electrical drawings.

F. Power wiring will be connected through all line voltage control devices such as firestats, smoke detectors and thermostats by Division 16 work.

PART 2 PRODUCTS

2.01 MOTOR STARTERS: Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide control wiring and install all motor starters, unless integrally factory mounted on a piece of equipment.

B. Provide control wiring to all motors except packaged units that are prewired between the starter and motor.

C. Where line voltage control devices are mounted at, on or inside a unit, such as aquastats, firestats for single phase devices, etc., the power wiring to the unit shall be connected through such a control device by the work of Division 16.

D. On final inspection, it shall be demonstrated to the Architect or his representative that each overload relay control circuit is properly wired and functioning correctly by manually tripping each overload relay individually, one at a time. This inspection procedure shall not involve removing any wiring or disconnecting any current carrying parts.

E. Standard minimum one year warranty on all electrical equipment provided herein shall apply.

END OF SECTION

SECTION 15080 HVAC TEST AND BALANCE

PART 1 GENERAL

1.01 RELATED DOCUMENTS: All work specified in this Section is subject to the provisions of GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS AND SECTION 15010.

1.02 SCOPE OF WORK

A. The Contractor shall procure the services of an independent Test and Balance Agency that is independent of any contractor or manufacturer to perform the testing and balancing and prepare reports to the General Contractor and to the Architects and Engineers. The independent Test and Balance Agency shall be a certified member of the Associated Air Balance Council (AABC).

B. The Test and Balance Agency contract shall not be assigned to any subcontractor; the Agency shall work directly under the General Contractor.

C. Testing and Balance Agency as part of its contract shall act as an authorized inspection agency, responsible to the Owner, and shall, during the test and balance, list systems that are installed incorrectly, require correction, or have not been installed in accordance with contract drawings and specifications.

D. One agency shall be responsible for all phases of Total System Balance.

E. Testing and balancing shall not begin until all systems have been completed and are in full working order. The Mechanical Contractor shall put all heating, ventilating, and air conditioning equipment into full operation and shall continue the operation of same during each working day of testing and balancing.

F. Upon the completion of the test and balance work, the Agency shall compile the test data and submit four (4) copies of the complete report to the Architect for his evaluation and approval.

G. After testing, adjusting, and balancing is complete, the Contractor shall visit the job during the heating cycle and during the cooling cycle to make adjustments to provide uniform temperatures throughout the building. Schedule the trips during the months of December through February for the heating cycle, and June through August for the cooling cycle. Obtain signed statements form the Owner acknowledging these two trips and subsequent adjustments. Submit statements to Architect.

1.03 LEAKAGE TESTS, MEDIUM AND HIGH PRESSURE DUCTS: Medium and high pressure duct leakage tests performed by the Contractor as specified under the Air Distribution Section shall be witnessed and certified by the Test and Balance Agency.

1.04 LEAKAGE TESTS, LOW PRESSURE DUCTS: The Test and Balance Agency shall witness and certify to duct leakage tests for low pressure ducts specified to be performed by the Contractor under the Air Distribution (or Air Conditioning) Section. The Test and Balance Agency shall furnish test instruments, confirm the readings, make the calculations for percentage of leakage in accordance with AABC standard methods and submit test report total. Leakage is specified to be not over 5% of the design CFM at the normal operating pressure of the duct system.

PART 2 PRODUCTS

2.01 MATERIALS

A. Provide all required instrumentation, equipment, tools, devices and utility services to perform the operations as specified herein.

B. Instruments used for testing and balancing of system shall have been calibrated within six months preceding tests and checked for accuracy prior to start of work.

C. Instruments shall be of a type normally recognized as adequate and accurate for the test contemplated. List type of instrument, manufacturer, serial number and latest calibration date as a part of the submitted test data.

2.02 PATCHING MATERIALS: Except as otherwise indicated, use same products as used by original Contractor for patching holes in insulation, ductwork, and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.

PART 3 EXECUTION

3.01 REQUIRED DOCUMENTS

A. The General Contractor shall provide the following, in a timely fashion to the Test and Balance Agency:

1. Contract drawings (complete set)
2. Applicable specifications
3. Addenda
4. Change orders
5. Reviewed shop drawings
6. Reviewed equipment manufacturer's submittal data
7. Reviewed temperature control drawings

3.02 COOPERATION

A. The General Contractor and his subcontractors shall cooperate fully with the Test and Balance Agency and provide:

1. Completely operable systems
2. The right to adjust the systems
3. Access to system components

3.03 BELT DRIVES

A. Adjustable speed drives are to be adjusted by the Test and Balance Agency. In cases where the specified capacities cannot be obtained with the original adjustable sheave or original fixed drive sheave, the Agency is to report to the Contractor the sheave size required to obtain the specified capacity.

B. Where larger or smaller sheave sizes are required, the Contractor shall provide new sheaves and, if required, new belts as specified in the AIR HANDLING Section.

3.04 OPERATING TESTS

A. A complete system operating test shall be made for a period of 8 hours with controls set in their various positions to insure proper operation under the design conditions. All tests and final adjustments shall be made to the complete satisfaction of the Owner and the Architect.

3.05 CONTROL PERFORMANCE CHECK: The results produced by the operation of automatic controls shall be checked by the testing agency; controls requiring adjustment shall be listed and reported to the Contractor.

This does not reduce the responsibility of the Contractor for the checking and adjustment specified under the Temperature Control Section.

3.06 SETTINGS: The Test and Balance Agency shall permanently mark the settings of all valves, dampers, and other adjustment devices in a manner that will allow the settings to be restored. If a balancing device is provided with a memory stop, it shall be set and locked.

3.07 REPORT

A. The following items shall be tested, recorded, and incorporated in the test and balance report. The report shall not be limited to these items. but shall include these tests as minimum requirements.

1. Record each fan manufacturer, model numbers and serial numbers.

2. Test, adjust and record required and measured total CFM for each fan system. Test and record quantity of exhaust of relief air in CFM.

3. Test, adjust and record all required and measured outside air quantities and return air CFM. Test and record quantity of return air in CFM.

4. Test and record required and measured system static pressures; filter differential, coil differential, and fan total static pressure.

5. Record all installed fan drive assemblies; fan sheaves, motor sheaves, and belts.

6. Record each installed motor manufacturer.

7. Record each installed motor horse power.

8. Test and record each motor name plate and measured voltage.

9. Test, adjust, and record each motor name plate and full load amperage.

10. Test, adjust, and record each blower RPM.

11. Test and adjust the CFM delivery of each diffuser, grille, and register.

12. Identify the location of each diffuser, grille, and register.

13. Record the size, type, and manufacturer of each grille, register and diffuser.

14. Data obtained for each diffuser, grille and register shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.

15. All diffusers, grilles, and registers shall be adjusted to minimize drafts.

16. All tests shall be made with supply, return, and exhaust systems operating, and all doors, windows, etc., closed or in their normal operating condition.

17. All damper positions shall be permanently marked after air balancing is complete.

18. The final balanced condition of each area shall include the testing and adjusting of pressure conditions. Front doors, exits, elevator shafts, etc., should be checked for air flow so that exterior conditions do not cause excessive abnormal pressure conditions.

END OF SECTION

SECTION 15100 PIPE HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General Conditions, Supplemental Conditions, apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Furnish hangers to support the required loads. Where necessary, supports shall be designed to permit movement due to expansion and contraction. Where drawings show details of supports and anchors, conform to details shown. Where details are not shown, conform to general requirements specified herein.

B. **"C" CLAMPS** shall not be used to support piping.

C. Do not pierce waterproofing with support bolts.

D. All ferrous metal hangers and supports, not otherwise coated shall be provided with a field applied coat of zinc chromate primer prior to installation. In lieu of field painting the contractor may furnish cadmium plated, or galvanized hangers and supports.

1.03 QUALITY ASSURANCE

A. All hangers, support, anchors, and guides shall be in accordance with the American National Standard Code for Pressure Piping, ANSI B31.1 with addenda 31.1 OA-69.

B. Provide an adequate suspension system in accordance with recognized engineering practices, using where possible, standard commercially accepted pipe hangers and accessories.

C. Horizontal suspended pipe shall be hung using adjustable pipe hangers with bolted hinged loops or turnbuckles. Chains, wire, perforated strap iron or flat steel strap are not acceptable.

D. Submit fastening methods to the structural engineer for approval and as approved copy to the engineer.

E. For the purpose of this specification figure numbers for Grinnell products are given; equal products by B-Line and Michigan Hanger Co. (M-Co) are acceptable.

1.04 DESIGN

A. Supporting steel not shown for the equipment will be designed, supplied and erected by the Contractor. (The supporting steel is that steel which is connected to the structural steel shown on the drawings and carries the weight of the mechanical items.) This supporting steel design must carry the dead weight and dynamic load imposed by the equipment.

B. The supporting steel shall be connected to the structural steel in such a manner as not to overload the structural steel. It is the responsibility of the General Contractor, Mechanical Contractor and the steel fabricator to verify that this purpose is accomplished. It is the responsibility of the General Contractor to call to the attention of the Architect-Engineer any deficiency prior to bidding.

C. Where thermal movement in the pipe line will occur, the pipe hanger assembly must be capable of supporting the line in all operating conditions. Accurate weight balance calculations shall be made to determine the supporting force at each hanger in order to prevent excessive stress in either pipe or connected equipment.

PART 2 PRODUCTS

2.01 UPPER ATTACHMENTS

A. Wood Construction:

1. Support piping in wood constuction with Side Beam Bracket, Grinnell Fig. 202 or Hanger Flange, Grinnell Fig 128R, using lag screws.

2.02 WALL SUPPORTS: Where piping is run adjacent to walls or steel columns welded steel brackets Grinnell Fig. 195 and 199 may be used. The bracket shall be bolted to the wall and a back plate of such size and thickness as to properly distribute the weight.

2.03 FLOOR SUPPORTS

A. Where pipe lines are located next to the floor and no provision for expansion are required support piping with Grinnell Fig. 258., pipe rest with nipple and floor flange.

B. Where provisions for expansion are required support piping with Grinnell adjustable pipe stand Fig. 274., or pipe roll stand Fig. 271.

C. Vertical piping shall be supported at every other floor using riser clamps Grinnell Fig. 261., for steel and cast iron pipe, and copper clad riser clamps Grinnell Fig. CT.121., for all copper piping.

2.04 SUPPORTS FOR PIPING OUTSIDE THE STRUCTURE: Support piping outside the structure on adjustable pipe supports Grinnell Fig. 264.

2.05 INTERMEDIATE ATTACHMENTS: Supports for horizontal piping shall be all threaded galvanized steel, ASTM A-107, Grinnell Fig. 146, of the following sizes:

Pipe Size	Hanger Rod Diameter
2" and smaller	3/8"
2-1/2" and 3"	1/2"
4" and 5"	5/8"
6"	3/4"

2.06 PIPE ATTACHMENTS

A. Hangers for insulated pipe shall be sized to bear on the outside of the insulation.

B. Hangers for steel and cast-iron horizontal piping where provision for expansion are not required shall be Grinnell Fig. 260., clevis type with vertical adjustment.

C. Hangers for uninsulated copper pipe 4" and smaller shall be copper plated adjustable band hangers Grinnell Fig. CT.99C., for pipe sizes over 4" provide Grinnell Fig. 260., clevis type hanger with a 4 psf lead saddle at each hanger location.

D. Hanger for PVC pipe shall be Grinnell Fig. CT.99., adjustable band hanger.

E. Hangers for steel and copper piping where provisions for expansion are required shall be Grinnell Fig. 171 or Fig 181., adjustable roller hanger with Grinnell Fig. 160., pipe covering protection saddles.

F. Support hot and cold water piping in spaces behind plumbing fixtures with plastic coated brackets and plastic coated U bolts.

G. Pipe guides shall be Grinnell Fig. 256.

PART 3 EXECUTION

3.01 INSTALLATION

A. Support horizontal equipment such as in-line pumps, strainers, air separators, independently of the piping system.

B. Hang pipe from substantial building structure. Pipe shall not be hung from other piping.

C. Support each horizontal length of NO-HUB cast iron pipe within 2-1/2' of each joint and a maximum of 5'-0" on centers.

D. Provide a hanger within one foot of each elbow.

E. Provide a hanger within one foot of each riser in addition to the riser clamp support at every other floor.

F. Unless specified otherwise provide the following support spacing.

1.

Pipe Size	Support Spacing
1" and smaller	5'-0"
1-1/4" and larger	10'-0"

END OF SECTION

SECTION 15180 THERMAL INSULATION FOR HVAC SYSTEMS

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Specification sections, apply to work of this section.

B. All work specified in this Section is subject to the provisions of Section 15010.

1.02 DESCRIPTION

A. All insulation products used outside of mechanical rooms shall meet NFPA requirements for Flame Spread Rating 25, Smoke Developed Rating 50, and Fuel Contributed 50.

B. Staples shall not be used for securing insulation. All insulation shall be installed in accordance with the insulation manufacturer's recommendations. Insulation shall be continuous through wall, ceiling, floor and roof openings and sleeves, except at fire/smoke dampers.

C. Supports for insulated piping shall be outside the insulation. Inserts shall be provided at hangers. Inserts shall be Foamglass Insulation, Calcium Silicate or Perlite and shall be 2" longer than the pipe shields. Pipe shoes welded to the pipe shall be used for roll type hangers.

D. All tests shall be completed before insulation is applied.

E. Do not store materials in building until it is enclosed and dry. Wet insulation shall not be installed.

F. Insulation products with self-sealing type jacket shall not be applied at temperatures below 40°F.

G. <u>Items not to be insulated:</u>

1. Ducts with internal lining or factory insulated ducts.

2. Exhaust duct inside building.

H. Clean and dry all surfaces to be insulated from loose scale, dirt, oil, water and other foreign matter.

I. Insulate completely all metal surfaces of piping, ductwork and equipment other than hangers.

J. Surface finishes shall present a tight smooth appearance.

K. Permit expansion and contraction without causing damage to insulation or surface finish.

L. Surface finish shall be extended to protect all surfaces, ends, and raw edges of insulation.

M. Vapor barriers must be continuous and uninterrupted throughout the system where specified except where insulation is interrupted for fire dampers. See details for special conditions.

1.03 PIPING

A. Insulate all valves, strainers and fittings. For the purposes of this Specification, fittings include unions and flanges. Use premolded material where available.

B. Insulate valves up to and including bonnets.

1.04 DUCTWORK: Insulation shall cover all standing seams and metal surfaces. Materials shall be applied subject to their temperature limits.

1.05 QUALITY ASSURANCE

A. Codes and regulations referred to are minimum standards. Where the requirements of these specifications or drawings exceed those of the codes and regulations, the drawings and specifications shall govern.

B. Any methods of application of insulation materials or finishes not specified in detail herein shall be in accordance with the particular manufacturer's published recommendations. Insulation shall be applied by experienced workers regularly employed for this type of work.

C. Insulation products shall be Manville, Knauf, Certainteed or Armstrong.

PART 2 PRODUCTS

2.01 FOAMED PLASTIC SHEET, AND TUBING

A. Minimum of 4.5 lbs. per cu. ft. Thermal conductivity shall not exceed 0.28 at 75° f mean temperature.

B. Insulate: Refrigerant Piping, Indirect refrig. waste and drains from air conditioning equipment.

C. Refrigerant piping <u>outside</u> the building shall be insulated with 1" thick flexible foamed plastic insulation.

2.02 FIBERGLASS DUCT INSULATION

A. Duct insulation round supply:

1. Duct wrap (blanket type) insulation shall be 2" thick, foil-faced 1 lb. density fiberglass type. Duct wrap shall be applied to all supply air ductwork not lined. Insulation shall have laps sealed with 3" wide fiberglass reinforced SMACNA foil tape. Thermal conductivity for duct wrap insulation shall be K=0.31 BTU-in. per sq. ft. per degree F mean temperature.

2.03 LOW PRESSURE DUCT LINER (RECTANGULAR SUPPLY & RETURN): Acoustical duct liner shall be a flexible type using long Fiberglass with a smooth firmly bonded fire-resistant surface to prevent erosion of the insulation. Surface shall not exceed 25 flamespread and 50 smoke development. Thermal conductivity shall not exceed 0.26 at 75° F. mean temperature. Noise reduction coefficient (NRC) shall not be less than .60 based on acoustical materials test, Mounting No. 6. Completely coat all duct surfaces with Benjamin Foster 85-15 adhesive. Neoprene coated side on liner shall face air stream. Sections shall be joined by coating the edges with Foster 30-36. Secure liner to duct system with self-adhering pins adhered to clean surface and secure with self locking washers; space pins not more than 4" from the edges and not more than 16" on centers. Lining shall meet

National Board of Fire Underwriters' Standards for Internal Duct Application and shall have a minimum density of 1"-1-1/2 lbs. per cu. ft. All duct liner shall be marked with the density located so as to be visible on the exposed surface of the liner. Air friction correction factor shall not exceed 1.40 at 2000 FPM and 1.5 at 4000 FPM.

2.04 ADHESIVES, MASTIC, COATINGS: Acceptable Manufacturers: Benjamin Foster, Childers, Insul-Coustic, EPOLUX, Minnesota Mining and Manufacturing Co.

PART 3 EXECUTION

3.01 GENERAL

A. Surfaces to be insulated shall be clean, dry, and free of foreign material, such as rust, scale and dirt when insulation is applied. Perform pressure tests required by other Sections before applying insulation.

B. Where existing insulation is damaged due to the new work, repair damage to match existing work or replace damaged portion with insulation specified for new work.

3.02 INSULATION FOR PIPING SYSTEM

A. Insulate pipe, fittings, flanges, unions and valves.

B. Install insulation materials with smooth and even surfaces, jackets drawn tight and cemented down smoothly at longitudinal seams and end laps. Do not use scrap pieces of insulation where a full length section will fit.

C. Install insulation, jackets and coatings continuous through wall and floor openings and sleeves.

D. Fittings, valves and flanges shall be insulated with field fabricated multiple mitered segments of molded fiberglass insulation of the same thickness as adjoining pipe insulation. Secure fitting insulation segments with 20 gauge galvanized steel wire and apply a smoothing coat of insulating cement. White fabric and mastic shall be used on exposed fittings.

E. Application of all materials shall be in accordance with the manufacturer's instructions.

F. Butt all joints of pipe insulation together and secure all jacket laps with lap adhesive. Seal all butt joints with joint straps furnished with insulation.

G. Care shall be taken so as not to place insulation over vent and drain inlets and outlets.

H. Staples are not permitted on pipe insulation.

I. Insulate all refrigerant piping and appurtenances subject to sweating, such as thermometer wells, gauge cocks, and valve stems, with preformed and mitered fiberglass pipe insulation. Finish with white vapor barrier mastic.

3.03 INSULATION FOR DUCT SYSTEM: Secure insulation to duct with Benjamin Foster 85-15 adhesive applied in 4 inch strips around the duct on 8 inch centers. Nylon cord shall be used to secure the insulation. Where ductwork is 36" wide or more secure insulation to the bottom of the duct using self adhering pins and self locking washers placed not more than 18 inches on center. Insulation shall overlap lining and factory applied insulation a minimum of 2 inches. Vapor barrier at all butted joints or breaks shall be sealed with 4" inch wide foil reinforced tape adhered with Benjamin Foster 82-07, Minnesota Mining, or approved equal.

END OF SECTION

SECTION 15317 REFRIGERANT PIPING SYSTEM

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. The requirements of the General Conditions and Supplementary Conditions.

B. Refer to Specification Section 15100 for specification and installation requirements of the pipe support system.

C. Refer to Specification Section 15180 for specification and installation of thermal insulation for the various types of pipe, fittings, and accessories specified in this section.

1.02 DESCRIPTION OF WORK

A. Extent of the piping systems work is indicated on the Drawings and schedules, and by the requirements of this section.

B. The construction requirements herein shall include appurtenant structures and buildings to which the piping system is to be connected.

1.03 QUALITY ASSURANCE

A. Codes and regulations referred to are minimum standards. Where the requirements of these specifications or drawings exceed those of the codes and regulations, the drawings and specifications shall govern.

B. Firms regularly engaged in manufacture of piping products of types, materials and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years are approved.

C. Certify brazing procedures, brazes and operators in accordance with Section IX ASME Boiler and Pressure Vessel Code (ANSI B31.5). Two copies of the qualification test report and certification shall be submitted to the Architect.

1.04 DEFINITIONS: Pipe sizes listed are for outside diameter of the pipe (O.D.).

PART 2 PRODUCTS

2.01 REFRIGERANT PIPE

A. <u>All Pipe Sizes:</u>

1. Type: Copper tubing of the pipe sizes listed.

2. Class: Type L hard drawn tubing, ASTM B-88

3. Fitting: Sweat type wrought copper.

4. Joints: Socket brazed with 95-5 tin-antimony

PART 3 EXECUTION

3.01 GENERAL PIPE SYSTEM

A. Nonferrous Metallic Pipe: Where nonferrous metallic pipe, e.g., copper tubing, crosses ferrous piping material, a separation must be maintained between pipes.

B. Cut pipe accurately to measurements, and ream free of burrs and cutting splatter. Carefully align and grade pipe, and work accurately into place. Fittings shall be used for any change in direction. Provide for expansion at every building expansion joint. Protect open pipe ends to prevent trash being placed in the lines during installation. Clean all dirt and cutting debris from pipes before making the next joint.

C. Install piping so as to preserve access to all valves, air vents, and other equipment and to provide the maximum headroom possible.

D. Joints shall be made with nitrogen gas in the pipes to prevent oxidation. All piping shall be installed parallel to or at right angles with building walls, columns, and partitions.

E. Clean inside of refrigerant lines with methyl alcohol before assembly and take care thereafter to prevent foreign matter from entering and being sealed in. Cut pipe ends square and deburr. Clean pipe and fitting with #00 steel wool before joining. Make joints without burning.

3.02 TESTS

A. Test refrigerant piping, equipment, valves and fittings at a pressure of 245 psi on the low side and 300 psi on the high side by introducing refrigerant and dry carbon dioxide (C02) or nitrogen throughout the refrigerant circuit. Bubble test joints with soap lather, clean joints of soap and leak-test with a halide torch. The system shall be pumped out and the entire circuit placed under 27 inches of vacuum and allowed to stand sealed off for a period of 8 hours, without any loss of vacuum.

B. Submit an affidavit signed by the Architect's representative and the Contractor's representative stating they have witnessed and approved the dehydration test.

3.03 SUBMITTALS: Submittals shall include but shall not be limited to a diagram approved by the compressor manufacturer, to include the size and length of the refrigerant piping, all offsets and elbows required for the installation location of all valves, filter driers, moisture and liquid indicators and flexible connectors where required.

END OF SECTION

SECTION 15400 PLUMBING BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 DESCRIPTION

A. This Section of the Specifications and related drawings describe requirements pertaining to the plumbing piping and equipment.

B. Refer to the following sections for related work:

15020	Identification of Piping Systems
15100	Pipe Hangers and Supports
15431	Drains, Cleanouts and Drainage Accessories
15442	Water Heaters - Electric
15450	Plumbing Fixtures & Trim

1.02 RECORD DOCUMENTS: Provide corrected Record Documents in accordance with the Project Record Documents Sections and the Mechanical General Section.

1.03 GENERAL PROVISIONS AND BASIC MATERIALS: The requirements of the Mechanical General Section apply to this work.

1.04 CODE

A. The work shall comply with the Standard Plumbing Code; acceptability under the codes shall not authorize any substitution, smaller size, lighter weight or less durable materials for the items specified.

B. The Contractor shall obtain and pay for all required permits and inspections and shall deliver one copy of each inspection certificate to the Architect before the date of Substantial Completion.

PART 2 PRODUCTS

2.01 PIPING MATERIALS FOR DRAINAGE SYSTEMS

A. Aboveground piping all within building: Service weight (SV) no-hub cast iron soil pipe and fittings CISPI301 with “husky” heavy duty stainless steel clamps, CISPI301 and neoprene gaskets, ASTM C-564.

B. Underground building drain piping to 5'-0" outside building: Service weight (SV) cast iron hub and spigot sold pipe and fittings, ASTM A74 with neoprene compression gasket, joints, ASTM C-564.

C. Underground piping all sizes outside building: Polyvinyl chloride pipe (PVC) ASTM D2665, PVC Type DWV fittings with solvent weld joints.

D. Condensate Drain Piping: Type DWV copper pipe with tin-antimony soldered joints and drainage fittings.

E. All traps shall have brass cleanout plug except where buried.

2.02 ROOF FLASHING: Vent pipes passing through roof shall be flashed with a one piece pipe flashing unit constructed of E.P.D.M. rubber with an aluminum reinforcing ring suitable for a temperature range of -25°F to 250°F as manufactured by Butler Manufacturing Company or approved equal. Flashing shall be installed in accordance with metal building manufacturer recommendations. Vents shall offset in roof joist area or ceiling cavity if necessary so that no vent shall be closer than 4'-0" from outside wall line.

2.03 WATER PIPING

A. Aboveground piping 3" and smaller within building: Type "L" copper tubing with tin-antimony soldered joints and wrought copper socket fittings.

B. Underground piping 3" and smaller beneath building slab to 5'-0" outside building: Type "K" hard drawn copper tubing, with 95-5 silver soldered joints and wrought copper socket fittings.

C. Underground piping 1" and smaller below building slab: Below slab Type "L" soft drawn copper tubing, with no joints.

D. Aboveground and underground piping outside building all sizes: Polyvinyl chloride (PVC) plastic piping Schedule 40, ASTM D-1785 with 150 PSI minimum pressure rating. Fittings shall conform to ASTM D-2466 with solvent weld joints conforming to ASTM D-2564.

2.04 BASIC PIPING SPECIALTIES

A. Unions:

1. Unions shall be the same material and working pressure as the fittings specified for the piping system. Unions on piping 2-1/2" in size and larger shall be bolted flanged joint and on smaller than 2-1/2" shall be screwed connection.

2. Unions and flanges provided between copper and ferrous pipe connections shall be insulating (dielectric) type to electrically separate dissimilar metal connections in piping system.

B. Dielectric Adapters:

1. Dielectric adapters shall be the union type for pipes 2" in size and larger. Adapters shall have working pressure of 250 psi for union type and 165 psi for flanged type. The insulating gaskets shall have an operating range of 40 degrees F. to 240 degrees F. and shall limit the galvanic corrosion to a maximum of 1% of the short circuit current. Dielectric adapters shall be Ebco, Crane or Capitol.

2. Provide a dielectric adapter between any ferrous and copper connection including piping and equipment.

C. Thermometers:

1. Thermometers shall be the red-reading mercury filled adjustable angle type. Thermometers shall be adjustable to any angle through a 180 degree arc and shall be provided with a locking device. Thermometers shall have V-cast aluminum case with baked enamel finish and 9 inch scale. Thermometers shall be provided with separable sockets and, where installed on insulated pipes, sockets shall be extended neck type. Thermometer scale range shall be 0 to 160 degrees F. Thermometers shall be Weksler Adjust-Angle Series Type AA-5, Trerice Adjustable Angle Series Type BX, or Weiss Vari-Angle Series Type VS.

D. Pressure Gauges:

1. Pressure gauges shall be connected to the piping system with threaded brass pipe and screwed brass fittings. Gauges shall be flangeless type and shall have 4-1/2" dials, cast aluminum cases, stainless steel rotary gear movements, phosphor bronze bourdon types, forged brass rod sockets and tips, 1/2% accuracy of scale range, plexiglass dial covers, safety blow-out disc and 1/4" lower connections. Gauges shall be Weksler Type AA1, Trerice No. 500X Series or Weiss Series PG.

2. Each gauge shall be provided with a needle valve type gauge cock suitable for the pressure and temperature of the system in which it is installed, and compatible with the gauge to which it attaches. Gauge cocks shall be Weksler Type A, Trerice No. 880 or Weiss Type LC.

3. Gauges in pump suction lines shall be the compound type. Gauges in all other locations shall be the plain pressure type. Select to operate at midpoint of scale during normal system operation.

4. Gauge cocks shall consist of a brass lever handle cock connected to the piping system with threaded brass pipe and screwed brass fittings. Gauge cocks shall be Weksler Type A, Trerice No. 880 or Weiss Type LC.

E. Pipe Sleeves:

1. The Contractor shall install, as required, in concrete, carpentry or masonry construction, all necessary hangers, sleeves, expansion bolts, inserts and other fixtures and appurtenances necessary for the support of all pipe, equipment and devices furnished under each section of the Specification.

2. Cutting of openings and installation of sleeves or frames through walls and surfaces shall be done in a neat workmanlike manner. Openings shall be cut only as large as required for the installation; sleeves, except as otherwise indicated, and/or frames shall be installed flush with finished surfaces and grouted in place. Surfaces around opening shall be left smooth and finished to match surrounding surface.

3. Where pipes pass through floor slabs, sleeve shall be standard weight black steel pipe with top of sleeve 3" above finished floor. Where pipes pass through walls, sleeves shall be standard weight black steel pipe or 20-gage galvanized sheet metal with ends flush with wall surfaces.

4. Each pipe passing through walls, floors, ceilings or partitions shall be provided with sleeves having internal diameter one inch larger than the outside dimensions of insulated pipes.

5. All pipe sleeves through floors, roofs and masonry walls shall be built in place as the affected walls, floors, and roofs are built.

6. All penetrations through rated floors shall be packed with mineral wool and capped off with a silicon caulk. As an alternate, an FM approved, fire rated sealant as manufactured by 3M, Hilti or approved equal may be used.

7. Sleeves through exterior wall shall be steel or cast iron pipe, flush with the exterior surfaces, and with the space between the pipe and the sleeves caulked watertight in an approved manner.

8. Inserts shall be cast iron or galvanized steel individual type, with accommodations for removable nuts and threaded rods up to 3/4 inch diameter, and permitting lateral adjustment.

E. Floor, Wall and Ceiling Plates:

1. Escutcheons shall be installed on all pipes where they pass through floors, ceilings, walls, or partitions in finished areas.

2. The interior of closets, adjacent to finished areas, shall be considered as finished for the intent of these Specifications.

3. Escutcheons shall be split, hinged, stamped brass type designed to fit the pipe, and to cover the terminating pipe sleeve, in chrome plated finish unless otherwise specified, with securing device to hold the escutcheon tight to the pipe.

2.05 WATER HAMMER ARRESTORS: Water hammer arrestors shall be stainless steel sealed bellows type, pressure rated for 250 psi, tested and certified in accordance with PDI standard WH-201; J.R. Smith Series 5000 or approved equal.

2.06 VALVES:

A. All shutoff valves shall be gate or ball valves unless otherwise noted. All drain valves shall be globe or angle valves unless otherwise noted.

B. Gate valves 2" and smaller shall be of Class 125, body and bonnet shall be of ASTM B-62 cast bronze composition, solid disc, copper-silicon alloy stem, brass packing gland, solder ends, Teflon-impregnated packaging, and malleable handwheel; NIBCO S-11 or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

Class 150 valves meeting the above specifications may be used where pressure requires; NIBCO S-134 or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

C. Ball valves 2" and smaller shall be 600 psi CWP, have cast brass bodies, replaceable reinforced Teflon seats, conventional port, blowout proof stems, chrome-plated brass ball, solder ends with extended solder cups; NIBCO S-580-BR-R-70 or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

D. Gate valves 2-1/2" and larger shall be Class 125 iron body, bronze mounted, with body and bonnet conforming to ASTM A-126 Class B cast iron, flanged ends, with Teflon-impregnated packing and two-piece packing gland assembly; NIBCO F-617-0 or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

E. Butterfly valves 2-1/2" and larger shall be lug type body, 200 PS; CWP, conforming to ASTM A-395 ductile iron, replaceable EPDM sleeve, with ductile nickel-plated disc, 410 stainless steel stem with extension for insulation, and EFDM O-ring stem seals. Sizes 2” - 6" shall be lever operated; NIBCO LD-3110-3 or approved equal.

F. Globe valves 2" and smaller shall be of Class 125, body and bonnet of ASTM B-62 cast bronze composition, solder ends, copper silicon alloy stem, brass packing gland, Teflon-impregnated packing and malleable handwheel; NIBCO S-235-Y or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

G. Globe valves 2-1/2" and larger shall be of Class 125 iron body, bronze mounted with body and bonnet conforming to ASTM A-126 Class B cast iron, flanged end, with Teflon-impregnated packing and two-piece packing gland assembly; NIBCO F-178-B or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

H. Check valves 2" and smaller shall be of Class 125, solder ends, with bodies and caps conforming to ASTM B-62 cast bronze composition, swing type disc; NIBCO S-413-BYW or approved equal by Walworth, Hammond Valve Corp., Conbraco Industries, Inc., or Grinnell.

2.08 PLUMBING SYSTEM INSULATIONS

A. All pipe insulation material shall have a permanent composite insulation, jacket and adhesive fire and smoke hazard rating as tested by procedure ASTM-B84, NFPA 255, and UL 723 not exceeding Flame Spread 25, Smoke Developed 50.

B. The use of staples for securing insulation will <u>not</u> be permitted.

C. Insulation shall be applied on clean dry surfaces. All insulation shall be continuous through wall and ceiling openings and sleeves.

D. Ends of fiberglass pipe insulation on cold pipe lines shall be sealed off with white vapor barrier coating at valves, flanges and fittings.

E. Unions shall not be insulated.

F. Pipe covering protection shields and saddles shall be provided around exterior of pipe insulation at pipe hangers which fit around pipe insulation. Foamglass pipe insulation shall be used under saddles on pipe 2" and larger.

2.09 FIBERGLASS PIPE INSULATION: Insulation shall be one piece fibrous glass sectional pipe insulation with white all service jacket. Longitudinal jacket laps and butt strips shall be self-sealing. Insulation shall have an average thermal conductivity not to exceed 0.23 BTU-in. per square foot per degrees F. per hour at a mean temperature of 75 deg. F. Insulation shall be Manville Fiberglass Micro-Lok AP-T Plus, Knauf, or approved equal..

2.10 APPLICATION:

A. Butt all joints of pipe insulation together and secure all jacket laps with lap adhesive. Seal all butt joints with joint straps furnished with insulation.

B. Fittings, valves and flanges shall be insulated with molded fiberglass insulation of the same thickness as adjoining pipe insulation. Insulation at fittings shall be covered with white PVC jacket as manufactured by Zeston, Manville, or approved equal.

INSULATION THICKNESS IN INCHES
FOR PIPE SIZES

	Temperature Up to	Up to 1"	1¼ to 2"	2½ to 4"	4" & Over
Cold Water	50°-65°F	1/2"	1"	1"	1"
Hot Water	200°F	1/2	1"	1"	1-1/2"

2.11 FOAMED PLASTIC SHEET AND TUBING:

A. Minimum of 4.5 lbs. per cu. ft. Thermal conductivity shall not exceed 0.28 at 75° F mean temperature.

B. Insulate:

1. Water cooler waste and trap with 1/2" thick foamed plastic tubing.

2. Piping outside the building shall be insulated with 1" thick flexible foamed plastic insulation with weatherproof aluminum jacket as hereinafter specified.

2.12 STORAGE TANK INSULATION:

A. Existing domestic water storage tank located within mechanical enclosure outside building shall be insulated with 2” thick preformed curved sidewall segments of phenolic foam insulation secured to tank circumferential stainless steel bands spaced at 9” o.c. with two coats of vapor barrier mastic (with open weave glass fiber reinforcing mesh in contrasting colors) to obtain total dry film thickness as recommended by vapor barrier coating manufacturer. All parts of storage tank shall be insulated including tank heads, pipe connections and flanges. Insulation shall be protected with a weatherproof aluminum jacket as hereinafter specified. Insulation shall be Koolphen “K” phenolic foam insulation or approved equal. Insulation shall be installed in accordance with insulation manufacturers’ recommendations for horizontal vessels larger than 36” in diameter.

2.13 WEATHERPROOFING:

A. Protect exposed water piping and existing horizontal domestic water storage tank from freezing down to 0°F in unheated areas with self-regulating heater cable with built-in thermostat. Cable shall be installed in contact with pipe/tank and beneath insulation. Protect insulation with Pabco insulating division aluminum sheets of .016 thickness and aluminum formed elbows with leak-proof beads and epoxy coated interior.

B. Heater cable shall be as manufactured by Raychem, Chromalox or approved equal.

2.14 PIPE HANGERS AND SUPPORTS: Provide pipe hangers and supports in accordance with Section 15100 "Mechanical Supporting Systems”.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install soil and vent piping pitched to drain at minimum slope of 1/4" per foot (2%) for piping 3" and smaller, and 1/8" per foot (1%) for piping 4 " and larger.

B. Install piping and make all joints in accordance with the pipe manufacturer's recommendations. Make provisions for thermal expansion and contraction.

C. Install cleanouts on drainage piping where indicated on the drawings and as required by the code, and at every change in direction of more than 45 deg. in horizontal piping. Locate wall cleanouts as low as possible but high enough for the cover plate to clear the base. Locate test tees where necessary to separate sections of piping for testing.

D. Rough-in for fixtures in accordance with the fixture manufacturers' roughing-in drawings to provide the heights and locations indicated on the Architectural drawings or as specified.

E. Set floor cleanouts so that the top rims are level and flush with the finished floor surface and so that square and rectangular tops are parallel to the walls, unless otherwise noted.

F. Install piping and pipe supports as specified. Keep pipe ends closed except for vent and drain openings; protect vent and drains from the entrance of materials that could cause stoppage.

G. Vents shall terminate at 1'-0" above roof.

H. Install shut-off valves where indicated on the drawings and required by the code including valves at all fixture groups, and equipment.

I. Install drain valves at low points of all new water piping except buried piping.

3.02 EXCAVATION, TRENCHING AND BACKFILLING

A. Perform all excavation, trenching and backfilling for work under Division 15. During excavation, material for backfilling shall be piled back from the banks of the trench to avoid overloading and to prevent slides and cave-ins. All excavated materials not to be used for backfilling shall be re moved and disposed of. Grading shall be done to prevent surface water from flowing into trenches and other excavation and any water accumulating therein shall be removed by pumping. All excavations shall be made by open cut. No tunneling shall be done.

B. Bottom of trench shall be uniformly graded to provide firm support and even bearing surface for pipe.

C. Pipe shall be laid on firm soil, laid in straight lines and on uniform grades. Provide bell holes so that barrels of pipe rest evenly on bottom of trench along entire length of pipe.

D. Pipe shall be inspected and tested prior to backfilling. No roots, rocks or foreign materials of any description shall be used in backfilling the trenches. Trench shall be hand filled to a minimum of 12" above the top of the pipe with clean earth and tamped to 95 percent compaction after first layer using the modified Proctor test method of compaction.

3.03 TESTS OF PIPING

A. Install temporary connections and plugs or valves at all points necessary for venting air from the piping, filling, holding test pressure, draining and flushing the piping.

B. Test all new soil, waste and vent piping under 10 feet head of water (except for the uppermost 10 feet) as required by the Plumbing Code, with zero leakage allowed. The test pressure shall be maintained for at least 30 minutes before inspection starts and maintained for the time necessary to inspect all joints but not less than 15 minutes.

C. Test all new pressure piping roughing hydrostatically to show zero leakage in eight (8) hours at the following pressures measured at the low points: Domestic water (C.W., and H.W.), 125 psi.

3.04 FLUSHING AND STERILIZING

A. Flush all new water piping after pressure tests and repairs are completed by draining from the low points; refill with clean water.

B. Sterilize the above ground water piping after fixtures and equipment are installed with 50 ppm chlorine solution distributed throughout all C.W. and H.W. piping; let stand for 24 hours, then flush enough water at drinking fountains and lavatories to reduce the residual chlorine content to less than one (1) ppm. Domestic water heater shall have the heat source shut off while sterilization is in progress.

3.05 START-UP, ADJUSTMENT, INSTRUCTION: Start-up, lubricate, adjust and test equipment installed under this Section and furnish instructions to the Owner as specified in the Mechanical General Section.

3.06 OPERATIONAL TESTS

A. When installation and adjustment of all fixtures and equipment is complete, perform operational tests of all plumbing system components at normal operating pressures as specified under the Mechanical General Section and include the following tests:

1. Operate all manual and automatic valves at least one full open-closed cycle; examine for stem leakage, failure to close or other malfunction.

2. Pour at least five (5) gallons of water into every floor drain to test for pipe stoppage.

END OF SECTION

SECTION 15431 DRAINS, CLEANOUTS & DRAINAGE ACCESSORIES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. All work specified in this section is subject to the general provisions.

B. Refer to the following sections for related work in connection with drains, cleanouts and drainage accessories.

15011 Submittals
15400 Plumbing Basic Materials and Methods

1.02 DESCRIPTION OF WORK: The number and size of the drains and cleanouts are indicated and scheduled on the drawings.

1.03 QUALITY ASSURANCE

A. Manufacturing firms shall be regularly engaged in the manufacture of plumbing products of type and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Subject to compliance with requirements, provide drains, cleanouts & drainage accessories of one of the following manufacturers:

1. Josam Mfg. Co.

2. Smith (Jay R.) Mfg. Co.

3. Wade div., Tyler Pipe

4. Zurn Industries, Hydromechanics Div.

PART 2 PRODUCTS

2.01 GENERAL

A. Provide factory fabricated drainage piping products of the size and type as indicated on drawings, including features as specified herein. Where not indicated, provide proper selection as determined by installer to comply with installation requirements and governing regulations.

B. Floor drains shall be provided with trap primer connections where indicated on drawings.

C. All floor drains without trap primers shall be provided with deep seal "P" traps.

2.02 CLEANOUTS

A. Vertical and horizontal lines exposed - Test Tee - Smith 4510.

B. Vertical lines concealed - Smith 4472 with stainless steel access cover.

C. Horizontal lines under unfinished floors - Smith 4405.

D. Finished floors - Smith 4023 cast iron adjustable floor level cleanout assembly with round polished bronze top.

E. Finished Floors - Linoleum, Terrazzo or Tile - Smith 4143 cast iron adjustable floor level cleanout assembly with round polished bronze top. Top depression to be covered with surrounding floor pattern bonded with waterproof adhesive.

F. All lines outside of building - Smith 4400.

G. Finished floors - Carpet Smith 4023-Y cast iron adjustable floor level cleanout assembly with nickel bronze top an 1-1/2" diameter stainless steel carpet marker. Carpet shall cover top of cleanout with carpet marker exposed above carpet to serve as cleanout locator.

PART 3 EXECUTION

3.01 EXECUTION

A. All floor drain strainers shall be securely fastened to drain body.

B. During construction drains shall be kept covered so that traps, sediment buckets and dome type strainers are kept free from debris and trash.

END OF SECTION

SECTION 15442 WATER HEATERS - ELECTRIC

PART 1 GENERAL

1.01 RELATED DOCUMENTS:

A. All work specified in this section is subject to the provisions of Section 15010 "Mechanical General".

B. Refer to the following sections for related work in connection with electric water heaters:

15011 Submittals
15020 Identification of Piping System
15100 Mechanical Supporting Systems
15400 Plumbing Basic Materials and Methods

1.02 DESCRIPTION OF WORK: The number and size of the electric water heaters are indicated on the drawings and schedules.

1.03 QUALITY ASSURANCE:

A. Manufacturing firms shall be regularly engaged in the manufacture of electric water heaters of type and sizes required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Provide water heaters which comply with ASHRAE 90.1b-1992 for energy efficiency.

C. U.L. and NEMA Compliances - Provide electrical components required as part of electric water heaters, which have been listed and labeled by Underwriters Laboratories and comply with NEMA Standards.

D. NEC Compliance - Comply with the National Electric Code as applicable to installation and electrical connections of ancillary electrical components of electric water heaters.

1.04 SUBMITTALS:

A. Product Data - Submit manufacturer's plumbing equipment specifications, installation and start-up instructions.

B. Maintenance Data - Submit maintenance data and parts lists for each item of accessory equipment. Include "trouble-shooting" maintenance guides. Include this data in maintenance manual.

PART 2 - PRODUCTS

2.01 GENERAL: Electric water heaters shall be of same manufacturer. Refer to schedule for heater sizes, capacities, electrical characteristics and element operation.

2.02 ELECTRIC INSTANTANEOUS HEATER:

A. Electric instantaneous point of use water heater shall have cast aluminum alloy or high impact plastic housing, with heating coils to be flow switch operated.

B. Provide flow control fitting at inlet of heater. Provide ball valve at inlet and outlet of heater.

C. Instantaneous heater shall be equal to Chronomite Laboratories, Inc.

PART 3 EXECUTION

3.01 INSTALLATION OF WATER HEATERS:

A. Install water heaters as indicated, in accordance with manufacturer's installation instructions, and in compliance with applicable codes.

B. Connections - Make connections between water heaters and domestic water piping shutoff valves with unions or flanges as indicated. Provide dielectric isolation at all heater connections.

C. Identification - Provide sign securely attached to water heater identifying equipment number, service and capacity. Provide valve tags on all valves and provide identification on all piping connections to water heaters.

D. Testing - Upon completion of installation, pressure test water heaters hydrostatically to assure structural integrity and freedom from leaks.

E. Disinfection and Flushing - Disinfect in accordance with potable water piping requirements and flush water heaters upon completion of installation in accordance with manufacturer's instructions, and comply with applicable health codes.

END OF SECTION

SECTION 15450 PLUMBING FIXTURES & TRIM

PART 1 GENERAL

1.01 RELATED DOCUMENTS: Drawings and general provisions of Contract, including General and Supplementary Conditions apply to work of this section.

1.02 DESCRIPTION OF WORK

A. Extent of plumbing fixtures and trim work is indicated by drawings and schedules, and by requirements of this section.

B. Refer to Division-16 sections for electrical connections to water coolers and other plumbing fixtures; not work of this section.

1.03 QUALITY ASSURANCE

A. Manufacturing: Firms shall be regularly engaged in the manufacturing of plumbing fixtures of the type, style and configuration required, whose products have been in satisfactory use in similar service for not less than five (5) years.

B. Comply with applicable portions of the Plumbing Code, latest edition, pertaining to materials and installation of plumbing fixtures.

C. Comply with applicable ANSI standards pertaining to plumbing fixtures and systems, and bath tub units.

D. Comply with ANSI A117.1 standard and the Americans with Disabilities Act (ADA) pertaining to plumbing fixtures for handicapped.

E. Comply with standards established by Plumbing and Drainage Institute pertaining to plumbing fixture supports.

F. Comply with applicable FS WW-P-541/-Series sections pertaining to plumbing fixtures.

G. Provide water coolers which are rated and certified in accordance with applicable Air-Conditioning and Refrigeration Institute standards and are listed by Underwriter's Laboratories.

1.04 SUBMITTALS

A. Submit manufacturer's specifications for plumbing fixtures and trim, including catalog cut of each fixture type and trim item furnished, roughing-in dimensioned drawings, templates for cutting substrates, fixture carriers, and installation instructions.

B. Submit maintenance data and parts lists for each fixture type and trim item, including instructions for care of finishes. Include this data in maintenance manual.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver plumbing fixtures individually wrapped in factory-fabricated containers.

B. Handle plumbing fixtures carefully to prevent breakage, chipping and scoring the fixture finish. Do not install damaged plumbing fixtures; replace and return damaged units to equipment manufacturer.

C. Fixtures shall be protected after installation to prevent scratches, dents, surface mar or any other damage during the course of construction.

PART 2 PRODUCTS

2.01 PLUMBING FIXTURES

A. Provide factory-fabricated fixtures of type, style and material scheduled on drawings. For each type fixture, provide fixture manufacturer's standard trim, carrier, seats, and valves as indicated by their published product information; either as designed and constructed, or as recommended by the manufacturer, and as required for a complete installation. Where more than one type is indicated, selection is Installer's option; but, all fixtures of same type must be furnished by single manufacturer. Where type is not otherwise indicated, provide fixtures complying with governing regulations.

B. Fixture color shall be white unless noted otherwise.

2.02 MATERIALS

A. Provide materials which have been selected for their surface flatness and smoothness. Exposed surfaces which exhibit pitting, seam marks, roller marks, foundry sand holes, stains, discoloration, or other surface imperfections on finished units are not acceptable.

B. Where fittings, trim and accessories are exposed or semi-exposed, provide bright chrome-plated or polished stainless steel units. Provide copper or brass where not exposed.

2.03 PLUMBING FITTINGS, TRIM AND ACCESSORIES

A. At locations where water is supplied (by manual, automatic or remote control), provide commercial quality faucets, valves, or dispensing devices, of type and size indicated, and as required to operate as indicated. Include manual shutoff valves and connecting stem pipes to permit outlet servicing without shut-down of water supply piping systems.

B. Include removable P-traps where drains are indicated for direct connection to drainage system.

C. Provide manufacturer's standard exposed fixture bolt caps finished to match fixture finish.

D. Where fixture supplies and drains penetrate walls in exposed locations, provide chrome plated cast-brass escutcheons with set screw.

E. Provide aerators on all faucet sets of types approved by Health Departments having jurisdiction.

F. Comply with additional fixture requirements contained in fixture schedule.

2.04 MANUFACTURERS

A. Subject to compliance with requirements, provide plumbing fixtures and trim of one of the following:

1. Plumbing Fixtures
   American Standard, U.S. Plumbing Products
   Eljer Plumbingware Division, Wallace-Murray Corporation
   Kohler Company
   Bradley
   Acorn

2. Plumbing Trim
   - American Standard, U.S. Plumbing Products
   - Chicago Faucet Company
   - Eljer Plumbingware Division, Wallace-Murray Corporation
   - Kohler Company
   - Speakman Company
   - T & S Brass and Bronze Works, Inc.
   - Eastman Brasscraft
   - McGuire Manufacturing Co.

3. Flush Valves
   - Toto
   - Coyne & Delaney Company
   - Sloan Valve Company
   - Zurn Industries, Inc., Hydromechanics Div.

4. Fixture Seats
   - Bemis Mfg. Co.
   - Beneke Corp., Div. of Beatrice Foods
   - Church
   - Olsonite Corp., Olsonite Seats

5. Water Coolers
   - Oasis
   - Elkay Mfg. Co.
   - Halsey Taylor Div.
   - Haws Drinking Faucet Co.

6. Service Sinks/Mops Sinks
   - American Standard, U.S. Plumbing Products
   - Eljer Plumbingware Div., Wallace-Murray Corp.
   - Kohler Co.
   - Fiat Products Co.
   - Stern-Williams

7. Stainless Steel Sinks
   - American Standard, U.S. Plumbing Products
   - Elkay Mfg. Co.
   - Just Mfg. Co.
   - Kohler Co.

8. Fixture Carriers
   - Josam Mfg. Co.
   - J.R. Smith
   - Wade
   - Zurn Industries, Inc., Hydromechanics Div.

PART 3 EXECUTION

3.01 INSPECTION AND PREPARATION

A. Examine roughing-in work of domestic water and waste piping systems to verify actual locations of piping connections prior to installing fixtures. Also examine floors and substrates, and conditions under which fixture work is to be accomplished. Correct any incorrect locations of piping, and other unsatisfactory conditions for installation of plumbing fixtures. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Install plumbing fixtures of types indicated where shown and at indicated heights; in accordance with fixture manufacturer's written instructions, roughing-in drawings, and with recognized industry practices. Ensure that plumbing fixtures comply with requirements and serve intended purposes. Comply with applicable requirements of the Plumbing Code pertaining to installation of plumbing fixtures.

C. Fasten plumbing fixtures securely to indicated supports or building structure; and ensure that fixtures are level and plumb. Secure plumbing supplies behind or within wall construction so as to be rigid, and not subject to pull or push movement.

D. Where fixtures are mounted against or abut walls, caulk along fixture.

3.02 CLEAN AND PROTECT

A. Clean plumbing fixtures of dirt and debris upon completion of installation.

B. Protect installed fixtures from damage during the remainder of the construction period.

3.03 FIELD QUALITY CONTROL

A. Upon completion of installation of plumbing fixtures and after units are water pressurized, test fixtures to demonstrate capability and compliance with requirements. When possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.

B. Inspect each installed unit for damage to finish. If feasible, restore and match finish to original at site; otherwise, remove fixture and replace with new unit. Feasibility and match to be judged by Architect. Remove cracked or dented units and replace with new units.

3.04 EXTRA STOCK: Furnish special wrenches and other devices necessary for servicing plumbing fixtures and trim to Owner with receipt. Furnish one (1) device for every ten (10) units.

END OF SECTION

SECTION 15668 SPLIT SYSTEM HEAT PUMP

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the provisions of Section 15010

B. Split system air handler shall be provided with minimum capacities scheduled, shall met all constraints of construction, and shall comply with all sections of this specifications.

1.02 COORDINATION: The units of one manufacturer have been used as a basis of design. Any modifications to ductwork, piping, wiring, building structure, etc., that result from the use of nay other units shall be coordinated with all trades prior to delivery of approved equipment from the manufacturer to the job site. Any costs incurred because of these modifications shall be the responsibility of the Contractor.

1.03 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable on this project: Trane or Carrier. The manufacturer shall have a local distributor with repair parts in stock or have access to repair parts within a 24 hour period.

PART 2 PRODUCTS

2.01 BLOWER COIL UNIT

A. Furnish and install units of the type and size as shown on the drawings. The unit and application rating data shall bear the ARI and UL seal. Units shall be for arrangement as shown on drawings.

B. The cabinet shall be constructed of 20 gauge steel. The cabinet shall be reinforced, braced and welded for maximum strength. All interior casing parts exposed to moisture laden atmosphere shall be zinc-coated sheet metal. Casing on cabinet unit shall be sound and thermal insulated with a glass fiber blanker fastened with water-proof adhesive. The basic unit front shall have heavy density ½" glass fiber insulation for thermal and acoustic insulation.

C. The coil shall be of the copper or aluminum tube, aluminum fin direct expansion type and shall meet the capacities as specified.

D. The unit drain pan shall have a zinc protective coat and shall be insulated on the underside. The drain pan is pitched to provide a smooth surface for positive condensate drainage, provided the unit is installed level.

E. The fans shall be centrifugal forward curved, double width. The fan housing volutes shall be metal high strength material.

F. Motors shall have thermal overload protection with resilient mounts.

G. Unit shall be furnished with built-in electric heating coil sized as shown on drawings. Coil shall have nichrome element, contactor, and safety controls. Coil shall be UL listed.

H. Unit shall be furnished with filter frame and 2 sets of 1" throwaway filters, Farr 30/30 or approved equal. Filter frame shall be furnished by manufacturer or job built to unit manufacturer's specifications.

I. Unit shall be Trane or Carrier.

2.02 OUTDOOR HEAT PUMP UNIT

A. Furnish and install in accordance with the manufacturer's instructions air cooled heat pump compressor/coil/fan units as shown on the drawings. Units shall be ARI rated.

B. The unit frame shall be a one piece welded assembly with zinc coated steel formed channel members. Exterior surfaces shall be phosphatized, epoxy primed and finished with baked on enamel.

C. Compressor shall be of the hermetic reciprocating type. Compressor shall have a forced feed lubrication system with strainers, magnetic plugs and centrifugal cleaning, reversible, positive displacement oil pump, two point lubrication for each bearing surface, built-in crankcase heater, internal spring loaded relief valves between high and low sides. Hermetic motors shall be suction gas cooled, sized for operation within the limits of the motor rating. Solid state sensors imbedded in motor windings shall protect the motor fan over temperature or overloads.

D. Condenser fans shall be of the vertical discharge, propeller type, direct drive, statically and dynamically balanced, with aluminum blades, and zinc plated corrosion resistant hubs. Motors shall have permanently lubricated ball bearings in accordance with NEMA Standard MG-1 complete with built-in current and thermal overload protections. Motors shall have weathertight slingers over the bearings.

E. Condenser coils shall be of the copper or aluminum tube, aluminum fin design with fins mechanically bonded to the tubes. Coils shall be factory tested at 450 PSIG air pressure under warm water and vacuum de-hydrated. Coil guards shall protect the coils form mechanical damage.

F. The control circuit shall include fusing, four way reversing valve, and control power transformer. Unit shall be wired complete with magnetic contactors for compressors and condenser fan motors. Compressor and condenser fan motors shall have overload protection. Unit safety controls shall include high and low pressure cutouts.

G. Units shall be Trane or Carrier.

2.03 CONTROLS FOR SPLIT SYSTEM HEAT PUMP: Controls shall be furnished by the unit manufacturer and shall include 7 day programmable room thermostat with sub-base. Thermostat shall have system "Heat-Off-Cool" switch and "On-Auto" fan switch. Wiring diagrams shall be furnished as required for installation.

END OF SECTION

SECTION 15670 SPLIT SYSTEM UNIT

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the provisions of Section 15010

B. Split system air handler shall be provided with minimum capacities scheduled, shall met all constraints of construction, and shall comply with all sections of this specifications.

1.02 COORDINATION: The units of one manufacturer have been used as a basis of design. Any modifications to ductwork, piping, wiring, building structure, etc., that result from the use of nay other units shall be coordinated with all trades prior to delivery of approved equipment from the manufacturer to the job site. Any costs incurred because of these modifications shall be the responsibility of the Contractor.

1.03 WARRANTY:

A. Provide parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.

B. Provide one year parts and warranty.

1.04 MAINTENANCE SERVICE:

A. Furnish complete parts and labor service and maintenance of packaged roof top units for one year from date of substantial completion by Contractor.

B. Provide maintenance service with a two month interval as maximum time period between calls. Provide 24 hour emergency service on breakdowns and malfunctions.

C. Include maintenance items as outlined in manufacturer's operating and maintenance data.

D. Submit copy of service call work order or report and include description of work performed.

1.05 REGULATORY REQUIREMENTS:

A. Unit shall conform to ANSI Z21.47/UL 1995 for construction of packaged air conditioner.

1. In the event the unit is not UL approved, the manufacturer must, at his expense, provide for a field inspection by a UL representative to verify conformance to UL standards. If necessary, contractor shall perform modifications to the unit to comply with UL, as directed by the UL representative, at no additional expense to the Owner.

1.06 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable on this project: Trane or Carrier. The manufacturer shall have a local distributor with repair parts in stock or have access to repair parts within a 24 hour period.

PART 2 PRODUCTS

2.01 AHU UNIT WITH COILS:

A. Furnish and install units of the type and size as shown on the drawings. The unit and application rating data shall bear the ARI and UL seal. Units shall be for arrangement as shown on drawings.

B. The cabinet shall be constructed of 20 gauge steel. The cabinet shall be reinforced, braced and welded for maximum strength. All interior casing parts exposed to moisture laden atmosphere shall be zinc-coated sheet metal. Casing on cabinet unit shall be sound and thermal insulated with a glass fiber blanker fastened with water-proof adhesive. The basic unit front shall have heavy density ½" glass fiber insulation for thermal and acoustic insulation.

C. The coil shall be of the copper or aluminum tube, aluminum fin direct expansion type and shall meet the capacities as specified.

D. The unit drain pan shall have a zinc protective coat and shall be insulated on the underside. The drain pan is pitched to provide a smooth surface for positive condensate drainage, provided the unit is installed level.

E. The fans shall be centrifugal forward curved, double width. The fan housing volutes shall be metal high strength material.

F. Motors shall have thermal overload protection with resilient mounts.

G. Unit shall be furnished with built-in electric heating coil sized as shown on drawings. Coil shall have nichrome element, contactor, and safety controls. Coil shall be UL listed.

H. Unit shall be furnished with filter frame and 2 sets of 1" throwaway filters, Farr 30/30 or approved equal. Filter frame shall be furnished by manufacturer or job built to unit manufacturer's specifications.

I. Unit shall be Trane or Carrier.

2.02 OUTDOOR CONDENSING UNIT:

A. General Unit Description:

1. Provide self-contained, packaged, factory-assembled and prewired units suitable for outdoor use consisting of cabinet, compressor(s), condensing coil and fan(s), integral subcooling circuit(s), filter drier(s), and controls. Provide expansion valve(s) and check valves for split system heat pump unit(s).

2. Performance Ratings: Energy Efficiency Rating (EER) [and Coefficient of Performance (COP)] not less than prescribed by ANSI/ASHRAE 90A.

B. Casing:

1. House components in 18 gauge zinc-coated galvanized steel frame and panels with weather resistant, baked enamel finish. Units surface shall be tested 500 hours in salt spray test.

2. Mount controls in weatherproof panel provided with removable panels and/or access doors with quick opening fasteners.

C. Condenser Coils:

1. Coils: Aluminum fins mechanically bonded to seamless copper tubing. Provide subcooling circuit(s). Factory leak test under water to 450 psig, and vacuum dehydrate. Seal with holding charge of nitrogen.

2. Coil Guard: Condenser coils shall be protected with a louvered steel guard. This coil guard shall cover the entire condenser coil.

D. Fans and Motors:

1. Vertical discharge direct driven propeller type condenser fans with fan guard on discharge. Fans shall be statically and dynamically balanced.

2. Weatherproof motors suitable for outdoor use, with permanently lubricated totally enclosed or open construction motors shall be provided and shall have built in current and thermal overload protection. Motors shall be either sleeve or ball bearing type.

E. Compressors:

1. Compressor(s): Provide direct-drive hermetic, reciprocating type compressor(s) with centrifugal oil pump providing positive lubrication to moving parts and automotive type pistons, rings to prevent gas leakage, internal suction and discharge valves and crankcase heater. Motor shall be suction gas-cooled with internal temperature and current sensitive motor overloads. Internally isolated motors on springs. External high and low pressure cutout devices shall be provided.

F. Controls:

1. Provide factory-wired condensing units with 24 volt control circuit with internal fusing and control transformers, contactor pressure lugs and/or terminal block for power wiring. Contractor to provide field installed unit mounted disconnect switch. Units shall have single point power connections.

2. Provide 24-volt,time delay relay with four minute delay between compressor staging on dual compressor units.

3. Provide factory installed evaporator defrost control to prevent compressor slugging by interrupting compressor operation when low evaporator coil temperatures are encountered.

4. Provide 24 volt, adjustable thermostat to control heating and cooling stages in sequence with delay between stages, and supply fan to maintain temperature setting. Locate thermostat in room as shown.

H. Units shall be Trane or Carrier.

PART 3 EXECUTION

3.01 INSTALLATION:

A. Install in accordance with manufacturer's instructions.

B. Provide for connection to electrical service.

C. Install units on vibration isolation.

D. Install units on concrete base as indicated.

E. Provide connection to refrigeration piping system and evaporators.

END OF SECTION

SECTION 15690 ENERGY RECOVERY VENTILATOR

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the provisions of Section 15010.

B. ERV shall be provided to meet the minimum capacities scheduled at the indicated conditions and shall meet all constraints of construction and shall comply with all Specification Sections.

C. Unit shall be tested and rated in accordance with the Air Moving and Conditioning Association, Inc. Standards and bear the AMCA Seal.

1.02 COORDINATION: Energy Recovery Ventilator of specific manufacturer has been used as the basis of design. Any modifications to controls, electrical connections, structural supports, etc., that result from the use of equipment by any other manufacturer, shall be coordinated with all other trades; this coordination shall occur before delivery of the equipment from the manufacturer. Any modifications shall be performed without incurring any additional costs to the Contract.

1.03 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable: Greenheck, Semco, or approved equal. Any units selected must meet or exceed all the requirements of these Contract Documents.

PART 2 PRODUCTS

2.01 UNIT CASING AND FRAMES:

A. Unit shall be of internal frame type construction of G90 galvanized steel.

B. All exterior metal to metal seams shall be sealed with closed cell neoprene gasketing, requiring no caulking at the site.

2.02 ENERGY RECOVERY WHEEL:

A. Wheel shall be of the enthalpy type for both sensible and latent heat recovery, and be designed to ensure laminar flow. Desiccant shall be silica gel for maximum latent energy transfer. Wheel shall be constructed of light weight polymer media to minimize shaft and bearing loads. Polymer media shall be mounted in a stainless steel rotor for corrosion resistance.

B. Wheel design shall consist of removable segments (for wheels greater than 26” diameter) for ease of service and/or cleaning. Segments shall be removable without the use of tools. Silica gel desiccant shall be permanently bonded to wheel media to retain latent heat recovery after cleaning.

C. Wheels with sprayed on desiccant coatings are not acceptable.
Wheels with desiccant applied after wheel formation are not acceptable.

2.03 INSULATION: Unit casing to be installed with 1” - 3# rigid board fiberglass with fire-resistant Foil-Scrim-Kraft facing. Insulation shall be in accordance with NFPA 90A and tested to meet UL 181 erosion requirements and to be secured to unit with water proof adhesive and permanent mechanical fasteners.

2.04 ACCESS DOOR: All Components shall be easily accessible through large removable access panels for both exhaust and supply compartments. Energy recovery wheel shall be mounted in a slide-out track for ease of inspection, removal and cleaning. Access to be provided in each individual section where blowers, filters and motorized damper are required.

2.05 FAN SECTIONS: Centrifugal fans to be doubled width, double inlet, single fan forward curved type. All blower wheels shall be statically and dynamically balanced. Motors shall be permanently lubricated, heavy duty, matched to the fan load and furnished at the specified voltage, phase and enclosure. Ground and polished steel fan shafts shall be selected for a minimum (L10) life in excess of 100,00 hours at maximum cataloged operating speeds Blowers shall be quiet running, forward curved type and enable independent balancing of exhaust and supply airflows by providing separate motors for exhaust and supply blowers with adjustable sheaves.

2.06 MOTORS AND DRIVERS: Motors shall be minimum horse power scheduled 1800 RPM - single speed ball bearing, rigid base, T-frame, ODP. Motors shall operate on 480 volts, three phase, 60 Hz and be factory mounted to an adjustable motor plate having two heavy duty adjustable bolts for alignment and belt tension. Drivers shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be of the fully machined cast 15 horse power and less shall be with and adjustable drive.

2.07 FILTERS: Outside air filters shall be 2” thick pleated fiberglass, 30% efficient and tested to meet UL Class 2. Filter racks shall be of die formed galvanized steel.

2.08 ELECTRICAL: All internal electrical components shall be prewired for single point power connection. All electrical components shall be UL listed, approved or classified where applicable and wired in compliance with National Electric Code. Disconnect switch and motor starters shall be supplied as standard components. Control box shall be include motor starters, control circuit fusing, control transformer for 24 VAC circuit and safety disconnect. Motor starters shall consist of contractors and Class 20 adjustable overload protection and shall be provided for all motors in the unit.

PART 3 INSTALLATION

3.01 INSTALLATION: Unit shall be installed in complete conformance with the manufacturer’s recommendations and the Contract Documents. Coordinate the actual unit to be provided with all trades.

3.02 ADJUSTMENTS: ERV shall be tested and adjusted to provide the scheduled capacities.

END OF SECTION

SECTION 15820 FANS

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the provisions of Section 15010.

B. Fans shall be provided to meet the minimum capacities scheduled at the indicated conditions and shall meet all constraints of construction and shall comply with all Specification sections.

C. Fans shall be tested and rated in accordance with Air Moving and conditioning Association, Inc. Standard No. 210 Test Code for Air Moving Devices and bear the AMCA Seal.

D. V-belt drivers shall be designed for not less than 150% of connection driving capacity and motor sheaves shall be adjustable to provide not less than 20% speed variation. Sheaves shall be selected to drive the fan at a speed to produce the scheduled capacity indicated on the drawings when set at the approximate midpoint of the sheave adjustment. Motors with V-belt drivers shall be provided with adjustable bases.

E. Fan motor enclosure shall be the drip-proof type unless specifically indicated otherwise. Motors two (2) horsepower and greater shall be the high efficiency type - Century-Plus or an approval equal.

F. Roof-mounted fans shall be waterproof design so that water cannot enter the building through the fan housing, whether or not the fan is operating.

G. Belt driven power assemblies shall be mounted on vibration isolators.

H. Centrifugal fan wheels shall be statically and dynamically balanced.

1.02 COORDINATION: Fans of specified manufacturers have been used as the basis for design. Any modifications to controls, electrical connections, structural supports, etc. that result from the use of equipment by any other manufacturer, shall be coordinated with all other trades; this coordination shall occur before delivery of the equipment from the manufacturer. Any modifications shall be performed without incurring any additional cost to the Contract.

1.03 ACCEPTABLE MANUFACTURERS: The following manufacturers are acceptable: Greenheck, Cook, Acme, Penn. Any units selected must meet or exceed all the requirements of these Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. CENTRIFUGAL INLINE FAN

1. Centrifugal inline fans shall have acoustically insulated housings with duct mounting collars and shall not exceed sound level ratings shown. Fans shall bear AMCA Certified Ratings Seal and U.L. Labels. Fan shall have two removable access panels of sufficient size to permit easy access to all interior components. Fan wheel shall be centrifugal backward inclined, constructed of aluminum, statically and dynamically balanced. Fan shaft shall be mounted in permanently sealed, permanently lubricated pillow block bearings. Bearings shall be selected for a minimum (L50) life in excess of 2000,000 hours at a maximum catalogued operating speed. Drive shall be sized for a minimum of 150% of driven horsepower. Pulleys shall be fully machined cast iron, keyed and securely attached to wheel and motor shafts. Motor pulley shall be adjustable for final balancing. A NEMA 1 disconnect switch shall bel provided. Factory wiring shall be provided from motor to handy box. Fans shall be Greenheck or approved equal by Cook, Acme or Penn.

PART 3 INSTALLATION

3.01 INSTALLATION: Fans shall be installed in complete conformance with the manufacture's recommendations and the Contract Documents. Coordinate the actual units to be provided with all trades.

3.02 ADJUSTMENT: The fans shall be tested and adjusted to provide the scheduled capacities.

END OF SECTION

SECTION 15840 DUCTWORK AND ACCESSORIES

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the general provisions of Section 15010.

B. Ductwork shall be provided to meet the minimum capacities indicated, shall meet all constraints of construction, and shall comply with all Specification Sections.

C. See Section 15180 for ductwork insulation (duct wrap and liner).

D. No ductwork shall be fabricated until fabrication shop drawings have been prepared, submitted and reviewed. Ductwork installed before reviewed shop drawings is entirely at the risk and expense of the contractor.

PART 2 PRODUCTS

2.01 DUCTWORK – GENERAL

A. SMACNA Standards indicated shall mean standard published the Sheet Metal and Air Conditioning Contractor's National Association, Inc. Ductwork shall be constructed in complete conformance with the latest edition of the SMACNA Manual. Duct classification shall be:

1. Low pressure - 2" static pressure, Class A Seals

B. Ductwork shall be constructed of G90 galvanized sheet steel,unless otherwise specified herein. All rectangular supply return ductwork shall be lined. Ductwork shall be round, oval or rectangular as indicated. Sizes given shall be considered to be the clear inside dimension.

C. Turning vanes shall be installed in all 90 degree square and rectangular elbows and at other locations shown. The turning vanes shall be double thickness type, with vanes secured to the runners and runners secured to the duct. Elbows in round ductwork and other radiused elbows shall have an inside radius equal to the diameter of the duct.

D. Low pressure round ducts up to including 12" in diameter shall be longitudinal lock seam construction. Round ducts larger than 12" shall be spiral lock seam construction.

1. Girth joints in ducts up to and including 12" shall be beaded crimp type and each joint shall be fastened with sheet metal screws, equally spaced, not more than 8" on centers and with a minimum of 3 screws in each joint. The beaded-crimp joint shall provide at least a 1" lap to accommodate the sheet metal screws.

2. Girth joints in ducts larger than 12" shall be the beaded sleeve type. The beaded sleeve joints shall be fabricated of the same gauge galvanized sheet steel and the duct shall be a minimum of 4" in length. Each section of duct shall be fastened to the sleeve with sheet metal screws equally spaced, not more than 8" on centers and with a minimum of 3 screws in each section.

E. Duct hangers and supports shall be in accordance with Section V (pages 5-1 thru 5-13) HANGERS AND SUPPORTS of the referenced SMACNA Standard, except:

1. Hangers shall be spaced not over 8'-0" on centers.

2. For rectangular ducts with longest dimensions up through 60", hangers shall be the galvanized steel strap type; with the longest dimension 61" and larger, hangers shall be trapeze type constructed of galvanized steel angles with round hanger rods. Sizes for strap hangers and trapeze angles and rods shall be based on duct size as scheduled in the SMACNA Standard, Table 5-1 (page 5-8) for strap hangers and Table 5-3 (page 5-10) for trapeze hangers.

3. For round ducts, hangers shall be galvanized steel strap hangers. Sizes and number of strap hangers shall be based on duct size as scheduled in the SMACNA Standard, Table 4-2 (page 4-9). For duct sizes requiring 2 hangers, the hanger supports shall be minimum 3/8" round steel hanger rods.

2.02 MANUAL DAMPERS AND DAMPER HARDWARE

A. Splitter dampers shall be constructed of not less than 20 gauge galvanized steel sheet. The length of the damper blade shall be the same as the width of the widest duct section at the split, but in no case shall blade length be less than 12".

B. Volume Control Dampers:

1. Dampers shall be single blade butterfly type in ducts up to and including 12" x 12" size; for ducts larger than 12" x 12", in either or both dimensions, the dampers shall be the multi-blade type. All dampers in O.A. ductwork shall shut tightly and have vinyl edge seals and stainless steel jamb seals.

2. Single blade butterfly dampers shall be constructed of not less than 16 gauge galvanized steel blades mounted in a galvanized steel frame. For rectangular dampers, the top and bottom edges of the blade shall be crimped to stiffen the blade. Damper shall be provided with an extended rod to permit installation of a damper regulator.

3. Dampers larger than 12" in either direction shall be multi-blade dampers and shall be the opposed blade type, constructed of not less than 16 gauge galvanized steel blade mounted in galvanized steel channel frame. Blade spacing shall not exceed 6" and the top and bottom edges of the blade shall be crimped to stiffen the blades. Damper blades shall be interconnected by rods and linkages to provide simultaneous operation of all blades. Damper shall be provided with an extended rod to permit installation of a damper regulator.

C. Hardware for Manual Dampers:

1. Splitter damper hardware - When neither dimension of a damper exceeds 18", the damper shall be provided with a ball joint bracket attached to the outside of the duct. The bracket shall have a set screw for securing damper rod in position. The damper operating rod shall be not less than 1/4" diameter steel rod and shall be secured to the damper blade with a clip. When either dimension of a damper exceeds 18", the damper shall be provided with 2 ball joint brackets and rods. The rods shall be located at quarter points on the damper.

2. Duct mounted regulators with operating handle and locking quadrant shall be provided on manual volume control dampers.

3. Damper hardware shall be Ventfabrics, Young Regulator or Duro-Dyne, provided the equipment meets or exceeds the requirements of the Contract Documents.

D. Acceptable manufacturers of dampers are Ruskin, Air Balance, or Louvers and Dampers Inc., provided the equipment meets or exceeds the requirements of the Contract Documents.

2.03 FLEXIBLE DUCTWORK

A. Flexible ductwork shall be Class 1, UL 181 air duct with an aluminized mylar or polyester inner liner laminated to a corrosion resistant steel wire helix. Aluminum helix is not acceptable.

B. A 1" thick, one (1) pound density fiberglass insulation and vinyl outer jacket shall cover the wire helix.

C. The maximum allowable length of low pressure flexible ductwork shall be 4'-0" and shall be limited to short run-outs and end runs connected to round neck ceiling supply diffusers. Provide a spin-in fitting with integral volume damper at all flexible run-out connections in low pressure ductwork.

D. Flexible ductwork shall be designed for pressures up to 4" W.G.

E. Acceptable manufacturers of flexible ductwork are Clecon, Wiremold, Flexmaster, Flexmold or Genflex.

2.04 FLEXIBLE DUCT CONNECTIONS: Flexible duct connections shall be non-combustible, installed at all belt-driven equipment and where shown. Material shall be glass fabric double coated with neoprene (30 0z. per square yard minimum) and shall be Vent Fabrics, Duro-Dyne or Young Regulator, provided the equipment meets or exceeds the requirements of the Contract Documents. Provide duct supports on each side of flexible connections.

2.05 STAND-OFF MOUNTING BRACKETS: Locking-type quadrant operators for dampers, when installed on ducts to be externally insulated, shall be provided with stand-off mounting brackets bases or adapters to provide clearance between the duct surface and the operator not less than the thickness of the insulation. Stand-off mounting items shall be integral with the operator or standard accessory of the damper manufacturer.

2.06 DUCT INSTRUMENT TEST HOLES: Provide for each system four (4) test holes; two (2) in supply duct and two (2) in return air plenum at opposite ends near air handling units with screwed caps.

2.07 REGISTER AND GRILLE CONNECTION:

A. Where take-offs are on side of a duct, clinch lock short tee sections onto trunk. Install collars with slip joints and 3/4" flange at outlet end. At plastered surfaces set collars exactly flush with plaster surface (mechanic must be on job to make adjustments during plaster application). Set flange face so as to receive register gasket, and be concealed by register flange. Collars may be deleted where mounting frames are furnished with registers.

B. Install boots above lay-in ceilings simultaneously with ceiling work; mechanic must be on job during this phase of construction work.

C. At return relief and exhaust grilles 48" or more in either dimension, collars shall be 1 x 2 x 1/8 inch steel angle frames with corners mitered, welded and ground smooth. Frames in ceilings shall be independently suspended from the ceiling structure, or the duct shall have special reinforcing to prevent sagging of the boot.

D. Interior of ductwork visible through grilles and diffusers shall be painted flat black.

2.08 ACCESS DOORS: Provide in duct wall at each splitter, fire, fire/smoke and motorized damper, at each end of coils, in plenums and elsewhere indicated. Size and position so as to provide access to bearings, fire links, etc. Typical doors shall be double metal faced, internally insulated same as duct provided with gasket seal, and held in place with four or more sash locks. Minimum size shall be 16" x 12", maximum duct size for smaller ducts.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install all ductwork and accessories as shown and in accordance with applicable SMACNA standards.

B. Duct liner shall be cut to provide overlapped and compressed longitudinal corner joints. Liner shall be installed with coated surface facing the air stream. Duct liner shall be adhered to the ductwork with a 100% coverage of the sheet metal surfaces using a fire retardant adhesive applied by spraying. Coat all exposed leading edges and all transverse joints with fire retardant adhesive. The duct and speed washers. All leading and trailing edges shall be secured with sheet metal airfoils.

C. Splitter Dampers:

1. Fabricate blades of same thickness galvanized steel as the duct where used (min. 20 ga.), securely attached to a rod at the air leading edge to present a round nose to air flow. Length shall be sufficient to close either branch duct.

2. Anchor splitters at the air entering edge by 3/16 inch adjustable galvanized steel rods that pass through set screw clamps on the outside of duct. Use one (1) rod and clamp on splitters with leading edge up to 15 inches, (2) rods up to 30 inches, and on 15 inch centers above 30 inches. See typical details on plans.

3. When splitter dampers occur above other than lay-in ceilings, provide Young Model No. 890-A damper assembly complete with supports, bearings and Young No. 1 regulators with an additional end bearing and chromium plated ceiling.

D. Joints in all low pressure ductwork shall be sealed with a water based gray vinyl acrylic sealant. Sealant shall be U.L. listed Class 1 classified adhesive with flame spread and smoke developed ratings of O. Sealant shall be applied to surfaces relatively free of dirt, oil and grease after ductwork has been installed. Sealant shall be Hardcast, Inc. "Iron Grip" IB-601 or approved equal.

END OF SECTION

SECTION 15870 GRILLES, REGISTERS AND DIFFUSERS

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the provisions of Section 15010.

B. Grilles, registers and diffusers shall be provided to meet the minimum capacities indicated, and shall meet all constraints of construction.

1.02 COORDINATION: The grilles, registers and diffusers of one manufacturer (Metalaire) have been used as the basis of design. Any modifications to ductwork, controls, building structure, etc., that result from the use of any other units shall be coordinated with all trades. This coordination shall occur before delivery of equipment from the manufacturer. Any modifications shall be performed without incurring any additional costs to the Contract.

1.03 ACCEPTABLE MANUFACTURERS

A. Manufacturers scheduled on drawings are the basis of design. Approved equal products may be Titus, Price, or Metalaire.

B. All devices selected must meet or exceed all the requirements of these contract documents.

PART 2 PRODUCTS

2.01 DESCRIPTION

A. Grilles, registers and diffusers shall be factory-fabricated of steel or aluminum, with finish as scheduled. Where the inlet and outlet openings are located less than 7 feet above the floor, they shall be protected by a substantial grille or screen in accordance with NFPA 90A.

B. The Contractor shall verify that all air distribution devices are suitable for the ceiling and wall types in which they are installed.

PART 3 EXECUTION

3.01 SELECTION: All grilles, registers and diffusers shall be selected and submitted at an NC level of 35 or less, and shall distribute the specified quantity of air evenly over space intended, without causing noticeable drafts, air movement faster than 50 FPM in occupied zone, or dead spots anywhere in the conditioned area. The Contractor shall be responsible for diffusion, spread, drop and throw. If, according to the certified data of the manufacturer of the proposed units, the sizes indicated on the drawings will not perform satisfactorily, the units shall be re-selected to perform quietly and effectively in accordance with the manufacturer's recommendations as approved by the Architect. A schedule of all air inlets and outlets shall be submitted to the Architect indicating location, types, specified air quantity, neck or face velocity, sound power level values, pressure drop, throw and drop for registers, and maximum and minimum diffusion range for diffusers. The inlets and outlets shall be sound rated and certified in accordance with Air Diffusion Council Equipment Test Code Standard 1062R3, in sound power level, decibels reference 10-12 watt, in octave bands 2 through 8.

3.02 INSTALLATION: Grilles, registers and diffusers shall be installed as indicated and in conformance with the manufacturer's recommendations. Coordinate the actual devices to be provided with all trades.

3.03 ADJUSTMENT: The grilles, registers and diffusers shall be tested and adjusted to provide the scheduled capacities. After the system is in operation, if drafts, dead spots, or excessive noise are noticeable in the conditioned spaces due to improper selection of type and size of diffuser, grille, or register, the unit shall be changed to the proper size and type without additional cost to the Owner.

END OF SECTION

SECTION 15900 AUTOMATIC TEMPERATURE CONTROLS

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section is subject to the provisions of Division 16.

B. Each system shall be controlled by manufacturer's 7 day programmable thermostat with fan "on-auto" switch, and system "heat-off-cool" switch. Thermostats shall be provided with remote temperature sensors where indicated on drawings. Thermostat locations shall be as shown on drawings.

C. Remote position indicators for the electric controllers shall be located adjacent to the controllers and controlled devices.

D. High limit thermostats shall be provided in intake of all exhaust fans and in discharge air of all supply fans except where smoke detectors are provided.

E. Smoke detectors shall be provided under Division 15 and installed by Division 15 in the supply air and return air path (s) at each furnace. Detectors shall be ionization duct-mounted type. All necessary interlocks, relays, contactors, etc., with the smoke detection system and mechanical equipment, shall be provided under Division 15. Wiring for unit shut-down shall be provided under Division 15. Provide normally open contacts at each smoke detector for interlock with building fire alarm system.

PART 2 PRODUCTS

2.01 MATERIALS AND COMPONENTS: All electrical components of the control systems shall conform to the requirements of Division 16.

PART 3 EXECUTION

3.01 INSTALLATION

A. The automatic temperature controls shall be installed in complete conformance with the manufacturer's recommendations and the Contract Documents.

B. The ATC systems shall be installed to provide a completely functional and fully coordinated system of control.

3.02 SEQUENCE OF OPERATION

A. HEAT PUMP SPLIT SYSTEM:

1. Units shall be started and stopped, subject to safety thermostats and smoke detectors, and by a thermostat mounted in space.

2. Install ionization type smoke detectors in the supply air and return air streams of all units. Upon signal from smoke detector or high limit thermostat, the fan shall stop. The fan shall stop via a signal obtained from the relay provided by Division 15. Control Wiring from the relay to the blower unit shall be by Division 15.

3. The control system shall only operate when the unit is running. All valves and dampers shall assume their normal position when unit is off.

B. SPLIT SYSTEM UNIT:

1. HVAC System: 4 ton split system with energy recover wheel, electric cooling and electric heat, humidity control and temperature control, safety shutdown. One stage of cool, three stages of heat, 18.73 kW total heat capacity.

2. Primary control setpoint will be % RH with a humidistat mounted in the R/A duct and hidden from the public. The setpoint shall be set at 60% RH with a 5% RH deadband and locked down with a Kenall Lexan sensor cover with security screws. The temperature setpoint will be controlled by the thermostat with a setpoint of 75 deg. F deadband. The thermostat will be located in the office area with a remote sensor mounted in the return airstream.

3. The humidistat will bring on the compressor if the humidity rises above setpoint.

4. The thermostat will bring on the compressor if the temperature rises above setpoint.

5. The thermostat will bring on the electric heat (three stages) if the temperature falls below setpoint.

6. The energy heat wheel will be stopped when the ambient temperature is between 55 and 75 deg. F deadband shall be 3 deg. F. The exhaust and supply fans will continue to operate.

7. Safety shutdown will be a smoke detector in the R/A and a smoke detector in the S/A duct. Alarm conditions will shut down the unit.

END OF SECTION

SECTION 16010 ELECTRICAL GENERAL REQUIREMENTS

PART 1 GENERAL

1.01 SCOPE

A. This Division and the accompanying electrical drawings cover furnishing all labor, equipment and materials and performing all operations in connection with the installation of complete electrical systems as documented.

B. There are many interfaces between the work involved with this Division and the work in other Divisions, particularly with Division 15. Be aware of the responsibilities at the interfaces.

C. The plans and specifications are considered cooperative and complimentary.

1.02 DEFINITIONS

A. Provide: furnish, install, connect, test, demonstrate and leave operational.

B. Wiring: wire or cable installed in raceway with all required boxes, fittings, connectors, etc.

C. Work: materials completely installed, including the labor involved.

D. Raceway: Galvanized rigid steel conduit (GRC), electrical metallic tubing (EMT), Intermediate metal conduit (IMC), schedule 40 Polyvinyl Chloride (PVC), where indicated on plans, flexible steel (FLX), sheathed flexible steel (SLT).

1.03 CODES AND REGULATIONS

A. All work shall comply with all local laws, ordinances and regulations applicable to the electrical installation, applicable building codes and with the requirements of the National Electrical Code (NEC), Vol. 70 of the N.F.P.A.

B. Where different sections of any of the aforementioned codes and regulations, the Specifications and/or the Drawings require different materials, methods of construction, or other requirements, the most restrictive shall govern. In any conflict between a general provision and a special provision, the special provision shall govern.

C. Obtain all permits and licenses, and pay all fees as required for execution of the Contract. Arrange for necessary inspections required by the city, county, state and other authorities having jurisdiction and present certificates of approval to the Owner or his designated representative.

D. Under no circumstances will asbestos, or asbestos related materials, be allowed on this project. Should any be found on the project they will be reported in writing and removed from the project by the contractor at no change in contract time or price.

E. Communicate with all required utility offices to meet utility schedules and regulations. Acquire services to avoid project delays.

1.04 SITE VISIT

A. All interested parties shall visit the site and thoroughly familiarize themselves with the local conditions in advance of any project activity.

B. No allowances will be made for lack of knowledge of job conditions.

1.05 DRAWINGS AND SPECIFICATIONS

A. The Electrical Drawings are diagrammatic, and are not intended to show the exact location of raceways, outlets, boxes, bends, sleeves, couplings or other such elements.

B. The Drawings and Specifications shall both be considered as part of the Contract. Any work or material shown in one and omitted in the other, or which may fairly be implied by both or either, shall be provided in order to give a complete job.

C. Should conflicts exist between the Drawings and Specifications, the Specifications shall govern.

D. Refer to the Architectural, Structural and Mechanical plans and details for dimensions, and fit the work to conform to the details of building construction. The right is reserved to shift any switch, receptacle, ceiling outlet or any other outlet a maximum of 10'-0" from its location as shown before it is permanently installed, without incurring additions to the Contract in time or cost.

E. All conduit and wiring shown on the Electrical Drawings shall be provided under this Division regardless of its function.

1.06 DEVIATIONS

A. No deviations from the drawings and specifications shall be made without the full knowledge and consent of the Owner and/or Engineer.

B. If it is found that existing conditions make desirable a modification in requirements covering any particular item, report such item to the Owner and/or Engineer for his decision and instructions.

1.07 MECHANICAL EQUIPMENT LOADS

A. The horsepower, wattage (or amperes) of mechanical equipment indicated is the estimated requirement of equipment furnished under another Division. All wiring, protective devices and disconnect switches shall be of the voltage, size and ampacity for the actual equipment installed. In no case shall these items be of smaller capacity than those indicated.

B. Coordinate with other trades and provide suitable equipment so that the above requirements shall be met without incurring additions to the Contract in time or cost.

C. The Contractor shall provide suitable disconnecting means in conformance with the requirements of the NEC, for all items or equipment utilized on the project no matter how, or by whom, furnished. However, duplication, or redundancy, is not required.

PART 2 PRODUCTS

2.01 STANDARDS FOR MATERIALS AND WORKMANSHIP

A. All material shall be new and shall bear the inspection label of Underwriter's Laboratories, Inc. (UL).

B. The published standards and requirements of the National Electrical Manufacturer's Association (NEMA), the American National Standards Institute (ANSI), the Institute of Electrical and Electronic Engineers (IEEE) and the American Society of Testing Materials (ASTM) shall govern and apply where applicable.

C. Specified catalog numbers and trade or manufacturers names are intended to describe the material, devices, or apparatus desired for type, style and quality. Similar materials of other manufacturers, if of equal quality, capacity or character may be substituted in conformity with the provisions of the General and Supplementary Conditions. Substitutions require "prior approval."

D. Where 3 or more manufacturers are named, one of the named manufacturers shall be used.

E. Where, in the opinion of the designer, no equal exists then "no equal" will be stated.

2.02 SHOP DRAWINGS

A. Shop drawings shall be submitted for the following equipment and items suitably bound, and marked, and with contents of no less than one specification section, as indicated below, per individual submission. Submittals not called for herein and/or submittals pertaining to the actual construction process will not be reviewed.

I. <u>SECTION 16100</u>

1. Conduit and fittings
2. Wire and Cable
3. Junction boxes
4. Pull boxes
5. Outlet boxes
6. Floor boxes
7. Cabinets
8. Wall switches
9. Individual wall dimmers
10. Receptacles
11. Coverplates
12. Supporting devices
13. Wire connection devices
14. Nameplates
15. Smoke & firestop fittings
16. Grounding system

II. <u>SECTION 16200</u>

1. Circuit breakers
2. Panelboards
3. Disconnect switches
4. Fuses
5. Distribution Panel Breaker

III. <u>SECTION 16300</u>

1. Lighting fixtures
2. Lamps
3. Ballasts
4. Lenses and diffusers

B. Shop drawings and/or catalog data submittals on all items of equipment and materials shall be submitted in conformity with requirements of the General and Supplementary Conditions. Do not submit more than the required number of sets.

C. A submittal including a list of the manufacturers of the principal items of material: wire, conduit, connectors, panelboards, switchboards, motor control centers, generators, etc., shall be submitted prior to the first shop drawing submission and within 30 days of contract award.

D. All material lists and shop drawing submittals shall include a stamped indication signifying that the submittals have been previously reviewed for compliance with the Contract Documents, that all coordination required prior to field installation has occurred and that the material being submitted is approved for installation. The stamped indication shall include the name of the contracting firm, the date of the review and the signature of the contractor. The Engineer will not review the shop drawing submittals without the contractor's stamped approval already on the shop drawings. The responsibility of complying with the Contract Documents will not be relieved by the Engineer's review.

E. All pricing is to be based upon the products, manufacturers, and processes described in the Contract Documents.

F. Samples of all materials proposed for use shall be presented to the Owner and/or Engineer for his approval when requested.

2.03 AS-BUILT (RECORD) DRAWINGS

A. Maintain on the job site at all times during construction a set of "As-Built" mylar sepias with all changes during construction marked thereon. Include any sketches or "marked-up" drawing prints as may be generated on the job site to assist in recording the changes.

B. The "As-Built" sepias shall show all changes and deviations from the Contract Drawings including relocation of outlets, conduit and equipment. Record final dimensioned locations of switchboards, panelboards, transformers, disconnect switches, etc. Make sufficient measurements to locate all underground conduit.

C. At the completion of construction, the sepia drawings, sketches and mark-up prints shall be presented to the Owner and/or Engineer.

2.04 MAINTENANCE AND INSTRUCTION MANUALS: Submit to the Owner and/or Engineer, upon completion of the work, three (3) copies of maintenance and instruction manuals for equipment provided.

2.05 SUBMISSION OF DRAWINGS: Submission of Engineers drawings for shop drawings and unaltered Engineer's drawings for "As-Built" will not be acceptable.

PART 3 EXECUTION

3.01 COORDINATION

A. Before any piping, conduit, outlets, equipment or lighting fixtures are located in any area, coordinate the space requirements with all trades. Such shall be arranged so that space conditions will allow all trades to install their work, and will also permit access for future maintenance and repair.

B. Piping, ductwork, conduit and equipment installed at variance with the above requirements shall be relocated and/or revised to conform with the above requirements without incurring additions to the Contract.

C. Coordination of space requirements with all trades shall be performed so that:

1. No piping or ductwork, other than electrical, shall be run within 42" of panelboards, switchboards or transformers.

2. No pipes or ducts that operate at a temperature in excess of 120 degrees F. shall be installed nearer than 3" to any electrical conductor.

3.02 PROTECTION OF MATERIALS

A. All conduit and other openings shall be kept protected to prevent entry of foreign matter. Fixtures, equipment, and apparatus shall be kept covered for protection against dirt, water, chemical or mechanical damage before and during construction.

B. The original finish, including shop coat of paint of fixtures, apparatus or equipment that has been damaged shall be restored without incurring additions to the Contract in time or price.

3.03 HOUSEKEEPING PADS: The contractor shall provide 4" minimum height concrete pad, integral with floor, under all floor mounted electrical equipment or apparatus.

3.04 CUTTING AND PATCHING: The Contractor is responsible for all cutting and patching, including escutcheon plates where necessary, whether or not such cutting and patching is shown or indicated.

3.05 ACCESS TO ELECTRICAL ITEMS: The contractor is responsible for maintaining access to all concealed electrical equipment, apparatus, or devices whether, or not, shown or indicated. Where access panels are required, refer to Owner or Engineer for approved means, methods and appearance.

3.06 ELECTRICAL ROOMS AND CLOSETS

A. Doors to electric rooms and closets shall open outward. If in conflict with Arch. drawings refer to Owner or Engineer for resolution.

B. Manufacturer's equipment shall not be larger than that dimensioned, or scaled, on plans. Conflicts shall be brought to the attention of the Owner, or Engineer for resolution prior to order.

C. Clear working space in electric rooms and closets shall be no less than that required by the N.E.C.

D. The contractor shall submit for review, prior to construction or purchase of any equipment, scaled drawings of electrical rooms, closets, or spaces showing, in detail, his planned installation locations of the equipment he intends to purchase. These shall clearly show compliance with A,B, and C above.

3.07 TESTS

A. Upon completion of the electrical work, conduct an operating test in the presence of the Engineer or his designated representative.

B. The installation shall be demonstrated to operate in accordance with the Contract Documents. Any material or workmanship which does not meet with the approval of the Engineer shall be removed, repaired or replaced as directed without incurring additions to the Contract in time or cost.

C. Furnish all instructions, tools and personnel required for the test. Have sufficient tools and personnel available to remove panel covers, coverplates, etc., as required for proper inspection. Provide suitable test equipment.

3.08 DEMONSTRATION AND INSTRUCTIONS: Present to the Owner and/or Engineer or his designated representative a physical demonstration and oral instructions for proper operation and maintenance of electrical equipment and systems installed.

3.09 GUARANTEE

A. All systems and components shall be provided with a one year guarantee from the time of final acceptance. The guarantee shall cover all materials and workmanship. During this guarantee period, all defects in materials and workmanship shall be corrected without incurring additions to the Contract. The correction shall include all required cutting, patching, repainting, or other work involved, including repair or restoration of any damaged sections or parts of the premises resulting from any fault included in the guarantee.

B. In addition to this general guarantee, present to the Owner and/or Engineer any other guarantees or warranties from equipment or system manufacturers. These supplemental guarantees or warranties shall not invalidate the general guarantee.

END OF SECTION

SECTION 16100 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section shall comply with the provisions of Section 16010.

B. This Section covers the basic electrical materials and installation methods that are applicable to Division 16.

PART 2 PRODUCTS

2.01 CONDUIT

A. Galvanized rigid steel conduit (GRC) shall be low carbon, hot-dipped galvanized and to meet UL Standards and shall have threaded joints.

B. Intermediate metal conduit (IMC) shall be steel, galvanized to meet UL Standards and shall have threaded joints.

C. Electrical metallic tubing (EMT) shall be steel, galvanized to meet UL Standards.

D. Plastic conduit (PVC) shall be schedule 40 PVC heavy wall type for all sizes unless noted otherwise.

E. Flexible metal conduit (FLX) shall be flexible steel conduit tubing and shall meet Underwriters Laboratories Standard for Flexible Steel Conduit.

F. Steel conduit approved manufacturers are Allied, Southwire, Triangle, Republic, Wheatland and Pittsburg.

G. PVC conduit approved manufacturers are Carlon, Triangle, and Johns-Manville.

2.02 CONDUIT FITTINGS

A. GRC and IMC conduit fittings shall be zinc-coated, ferrous metal and taper threaded type.

B. EMT fittings shall be zinc-coated steel and hexnut compression or set-screw type. EMT connectors shall have insulated throats.

C. PVC fittings, elbows and cement shall be produced by the same manufacturer. All joints shall be solvent welded in accordance with the manufacturer's recommendations.

D. Conduit connections to switchboards, motor control centers, transformers, panels, cabinets, and pull boxes with specific grounding requirements, shall have grounding wedge lugs between the bushing and the box or locknuts designed to bite into the metal.

E. Each conduit end shall be provided with either an insulated throat connector or separate locknut and insulated bushing. Bushing shall be installed before any wire is pulled.

F. Conduit fittings approved manufacturers are Raco, Steel City, O.Z Gendy, Thomas & Betts, Efcor and Appleton.

G. Expansion fittings shall be provided in all conduit which crosses an expansion joint either in, across, or through same.

2.03 CONDUCTORS: Conductors shall be copper of 98% conductivity, 600 volt insulation. Sizes specified are AWG gauge for No. 4/0 and smaller and circular mils (MCM) for all sizes larger than No. 4/0. Conductors No. 10 and smaller shall be solid or stranded and type "THHN" or THWN" insulation. No. 8 and larger shall be stranded and type "THHN" or "THWN" insulation.

2.04 OUTLETS

A. Outlet boxes and covers shall be of such form and dimensions as to be adapted to their specified usage, locations, size and quantity of conduit, and size and quantity of conductors entering the boxes. In special "Fire Rated" partitions, outlets shall comply with ASTM No. E119.

B. Flush ceiling outlets for surface or pendant mounted lighting fixtures shall be one-piece 4" square or octagonal pressed steel boxes. Boxes for devices in unfinished masonry walls or stud walls shall be pressed steel, square corner, sectional switch boxes, or shall be 4" square box with a square cornered tile wall cover, set flush with masonry construction. Boxes in concrete ceiling slab shall be octagonal, shallow concrete boxes. Welded boxes are not acceptable. Steel boxes shall be used with all steel conduit and type AC or MC cable. Boxes used in conjunction with ENT shall conform with the foregoing except shall be made of a high heat-resistant plastic suitable for fixture support and shall be specifically designed for use with ENT.

C. All outlet boxes in plaster or masonry walls or ceiling shall be provided with plaster rings.

D. Junction boxes and all outlets not indicated as containing wiring devices or lighting fixtures shall have covers. Covers for outlets in walls shall be as specified for wall switches and receptacles.

E. Outlet boxes exposed to the weather and outlet boxes for vaportight lighting fixtures and devices shall be of cast corrosion resistant type.

F. Outlet box approved manufacturers are Appleton, Raco, Steel City or Crouse-Hinds.

2.05 DISCONNECT SWITCHES

A. Disconnect switches shall be "heavy-duty" type enclosed switches of quick-make, quick-break construction. Switches shall be horsepower rated for 600 volts AC as required. Lugs shall be UL listed for copper and aluminum cable.

B. Padlocking provisions shall be provided for padlocking in the "Off" position.

C. Switches shall be furnished in NEMA I General Purpose enclosure unless noted otherwise. Switches located on the exterior of the building or in "wet" locations shall have NEMA 3R enclosures.

D. Fused disconnect switches shall have rejection type fuse clips with dual element, current limiting fuses of rating shown.

2.06 NAMEPLATES: Nameplates shall have 3/8" high engraved letters, white core laminated bakelite with black finish for 120/208V.

2.07 WALL SWITCHES

A. Wall switches shall be plastic, totally enclosed, quiet type, self-grounding, 120-277 volts and 20A rating.

Single Pole: Hubbell No. 1221
Double Pole: Hubbell No. 1222
Three-way: Hubbell No. 1223
Four-way: Hubbell No. 1224

B. Color shall be brown or as selected by owner's representative. Verify with Architect.

C. Comparative switches by Arrow Hart, Leviton, Bryant, or Sierra are acceptable as equal.

D. Flush motor switches shall have a red pilot light and overload protection for fractional horsepower motors.

E. Wall dimmer switches shall be totally enclosed, self-grounding, vertical slide type, square law dimming, with 600 watt capacity unless shown otherwise.

2.08 RECEPTACLES

A. Duplex receptacles shall be plastic, two-pole, three wire, self-grounding, side wired, 125 volts and 20A rating. Hubbell No. 5262 Series. Isolated ground type to be Hubbell No. IG-5262 Series. GFCI type to be Hubbell No. GF-5362 Series.

B. Single receptacles shall be two-pole, three wire, self-grounding, side wired, 125 volts and 20A rating, Hubbell No. 5361 Series. Isolated ground type to be Hubbell No. IG-5361 Series.

C. Color shall be brown or as selected by owner's representative. Verify with Architect.

D. Clock outlets shall be Arrow-Hart 5708.

E. Comparative devices by Arrow-Hart, Leviton, Bryant, or Sierra are acceptable as equal.

2.09 COVERPLATES

A. Coverplates for flush mounted devices in all areas shall be polished brass, standard size or as selected by owner's representative. Provide oversize for boxes that require extra cover due to construction conditions with existing brick as needed.

B. Telephone outlet coverplates shall have same finish as above and have a bushed hole in the center.

C. Coverplates for exterior receptacles shall be self closing, die cast aluminum. Ensure that the cover meets NEC Article 410-57.

2.10 PLYWOOD BACKBOARDS

A. Provide plywood backboards where shown. Backboards shall be minimum 3/4" thick and sized as shown or to accommodate equipment indicated to be mounted thereon. Plywood shall be fire retardant.

B. Secure plywood to the building structure and paint with two coats of fire retardant gray paint.

2.11 SMOKE AND FIRE STOP FITTINGS: If and where required, smoke and fire stop fittings shall be U.L. listed for that purpose. The fittings used to seal conduit either on the outside of the conduit, busway or cable or internally shall have heat activated intumescent material which expands to fill all voids and shall be O.Z./Gedney "FIRE-SEAL" ,Dow Corning silicone RTV or equal foam with an hourly fire-rating equal to or higher than the rating of the floor, ceiling or wall through which the cable or conduit passes. The seals for conduit shall be of the flanged type.

2.12 FLOOR OUTLETS

A. If and where required, floor outlets shall be single gang floor boxes, Steel city No. 600 Series, complete with cast iron body, vertical angular adjustment, bronze frame, bronze floorplate and gasket. Larger than standard tappings shall be furnished where required. Adjacent boxes shall be installed on minimum 7" centers.

B. Duplex floor receptacle outlets shall have No. P-60-DU floor plate, a No. P-60-CP carpet plate where installed in carpeted floor and a Hubbell 5262 Series duplex receptacle. Single floor receptacle outlets shall have a No. P-60-2 plate and Hubbell single receptacle. Provide a No. 700 split bell nozzle for each 5261 Series single receptacle and two (2) No. 703 for each duplex receptacle.

C. Floor outlets for telephone, signal or alarm use shall have a No. P-60-3/4-2 floor plate and a No. 467 bushed opening standpipe with a No. 461 base, all bronze finish.

D. Comparative devices by Arrow-Hart, Leviton, Bryant, or Sierra are acceptable as equal.

2.13 FUSES

A. Provide all fuses. All fuses shall be of the same manufacturer. All fuses shall be of the high interrupting rating (200,000 Amps), current limiting type. Fuses shall be provided for each fuse cutout and the specified quantity of fuses shall be furnished for spares.

B. Circuits 0 to 600 ampere shall be protected by rejection type, current limiting type. All dual-element fuses shall have separate overload and short-circuit elements. Fuse shall incorporate element having a 284 degree F. melting point alloy and shall be independent of the short-circuit clearing chamber. The fuse must hold 500% of rated current for a minimum of 10 seconds and be listed by Underwriter's Laboratories, Inc., with an interrupting rating of 200,000 amperes RMS symmetrical. The fuses shall be UL Class RK-1.

C. Furnish and turn over to the Owner a minimum of one (1) set of spare fuses (set consisting of three fuses) for each type and rating of fuse used. When the number of fuse sets of the same type and rating actually installed exceeds five (5) sets, furnish an additional spare set of fuses for each five (5) or fraction thereof.

D. Provide a cabinet in which to store all spare fuses.

PART 3 EXECUTION

3.01 CONDUIT

A. Rigid steel shall be used for service entrance and all feeders and branch circuits where exposed to damage.

B. EMT may be used for branch circuits, fire alarm and telephone when not underground or in concrete in contact with the earth (Contractor's option).

C. Schedule 40 PVC may be used for all underground feeders, service entrance conductors when encased in 4" of concrete on all sides, or under the lowest floor slab.

D. ENT may be used for lighting and receptacle circuits (Contractor's option).

E. Type AC or MC cable may be used for lighting and receptacle circuits (Contractor's option).

F. Conduit shall be continuous from outlet to outlet, from outlet to cabinet, junction box and pull box. Conduit shall enter and be secured to all boxes, etc., in such a manner that each system will be electrically continuous from service to all outlets. All conduit from cabinets and junction boxes shall terminate in approved outlet boxes or conduit fittings. Conduit connections to any box which has no threaded hub shall be double locknutted.

G. Provide junction boxes or pull boxes where shown and where necessary to avoid excessive runs or too many bends between outlets. The conduit sizes shown may be increased if desired to facilitate the pulling of cables.

HI. All conduit shall be concealed unless indicated otherwise. Install exposed conduit parallel with or at right angles to the building walls and support from walls or ceilings at intervals required by Code with approved galvanized iron clamps or hangers. Concealed conduit above the ceiling shall be supported independent of ceiling construction. Where ceilings of lay-in type are used, conduit must be installed high enough to permit removal of ceiling panels and lighting fixtures. Use threaded rods and hangers consisting of double-nutted threaded rods and "Unistrut" channels or angles of 12 gauge minimum steel for supporting multiple conduit.

I. Minimum size conduit for branch circuits shall not be smaller than 1/2". Home runs shall extend from outlets shown to panel designated. Home runs shown shall not be combined. Home run conduit shall not be smaller than 3/4".

J. At couplings, conduit ends shall be threaded so that they meet in the coupling. Right and left hand couplings shall not be used.

K. All conduit for future use and for telephone data or TV wire shall be left with No. 16 gauge wire or approved pull cord pulled in them.

L. Expansion fittings shall be installed in all conduit which pass through expansion joints.

M. Provide non-hardening elastic type duct seal compound, Neer No. DC, 3M Co. "Scotchfil", or Gardner Bender duct seal, or engineer approved equal for each conduit entering the building from outside and for each conduit passing from one space into another which is normally at a lower temperature.

N. Provide watertight conduit hubs on conduit terminating in a box or cabinet exposed to the weather.

O. Space in sleeves or around conduit that pass through fire resistive or fire rated walls, partitions, floors or ceilings shall be closed by packing with an unlabeled fire resistive material that will maintain the rating of the barrier penetrated.

P. All conduit located on exterior of building shall be rigid alunimum.

3.02 FLEXIBLE CONDUIT:

A. PVC extruded cover flexible conduit shall be used in making short flexible connections to rotating or vibrating machinery or equipment. The flexible conduit at these locations shall be as short as possible, but shall have a minimum length of 12".

B. A green stranded bonding jumper shall be installed outside of all flexible conduit that extends directly from a non-flex conduit to a rotating or vibrating machine. Where a junction box is used, the green stranded bonding jumper shall be installed inside the flexible conduit and attached to the junction box and to the machine. When the bonding jumper is installed outside of the flexible conduit, plastic wire straps shall be used 6" o.c. to secure the jumper to the flexible conduit.

3.03 CONDUIT PROTECTION:

A. All conduit installed in the ground either outside or beneath the building (with the exception of exterior lighting circuits), shall be encased in 4" of concrete on all sides. Concrete shall be a minimum of 3000 P.S.I. mix. All threaded joints in rigid conduit that is encased in concrete shall have a U.L. listed joint compound applied. Where conduit inside the building is installed below the floor slab, the vapor barrier shall be run below the conduit concrete encasement. Conduit installed in any slab, where permitted above, shall be above the bottom steel and below the top steel. No conduit shall be spaced less than 3" apart.

B. Conduit shall be secured in place and protected where necessary to prevent damage to work during construction. The ends of all conduit shall be plugged to avoid filling with any foreign matter. All conduit shall be blown out and swabbed clear of water and trash prior to pulling wire.

C. Provide identifying marker tape the entire length of each conduit installed in the ground outside the building. The tape shall be constructed of inert polyethylene, resistant to acids, alkalis, etc., in the soil, and shall be a minimum 4 mil thickness. The tape shall be yellow, 6" wide, and shall have the words, "CAUTION - ELECTRIC LINE BURIED BELOW," imprinted with contrasting permanent ink. The imprint shall repeat itself for the entire length of the tape. The tape shall be buried at a maximum of 18" below finished grade, above a portion of the earth fill.

3.04 WIRING:

A. All conductors shall be installed in conduit. No conductors shall be pulled into the conduit until the conduit system is complete.

B. Conductors shall be continuous from outlet to outlet and from outlet to junction box or pull box. All splices and joints shall be carefully and securely made to be mechanically and electrically solid with pressure type connectors. Where connection is made to any terminals of more than 30 amperes capacity and where conductors larger than No. 10 AWG are connected to any terminal, copper terminal lugs shall be bolted to the conductors. Where multiple connections are made to the same terminal, individual lugs for each conductor shall be used.

C. Each conduit shall have a minimum of two (2) conductors pulled in unless that particular conduit is noted as being for systems other than electrical circuitry and/or future use or unless noted otherwise.

D. Conductors for lighting and receptacle circuits shall have color coded jackets. The wiring shall be color coded with the same color used with its respective phase throughout the entire job as follows:

120/208 Volt System
Phase A - Black Ground - Green
Phase B - Red Travelers - Yellow
Phase C - Blue Neutral - White

E. The feeder and service entrance conductors shall be color coded by the use of colored plastic tape applied within 6" of each conductor end.

F. Branch circuit conductors shall not be smaller than No. 12 AWG and where the home run from center of load exceeds 100'-0", the conductors from home run outlet to panel shall be No. 10 AWG minimum.

G. Branch circuit wiring which supplies more than one fluorescent fixture through wireway of other fixtures shall be rated for use at 105 degrees C.

H. For branch circuits terminating in outlet without device, leave minimum of 12" of slack wire coiled for connection of equipment.

I. All conductors shall be identified with proper circuit numbers at terminals, junction boxes and at panelboards within 6" of conductor ends.

J. Stranded conductors, #10 and smaller, shall be terminated at screw type terminals with fork type insulated wire terminals applied with manufacturer's tool.

K. Conductor sizes are generally indicated in schedules and riser diagrams, otherwise follow rules of N.E.C.

3.05 OUTLETS

A. Provide galvanized steel or cast type boxes for all outlets.

B. Where outlet boxes are used to support lighting fixtures, the outlet box shall be anchored to the structural members of the building per NEC 370-13.

C. Outlet boxes shall be flush mounted unless they are specifically shown as being used with exposed conduit or are located above a ceiling.

D. Where outlets are supplied from conduit run in or below floor slabs, the conduit shall be stubbed up at the location shown and the wall built up around the conduit.

E. Cuts for outlet boxes in masonry walls shall be made so that the coverplate will completely cover the cut. The mounting height of switch, receptacle and other outlets may be varied slightly, with the Engineer's approval, so that the outlet box, top or bottom, will occur at a masonry joint.

F. The edge of all outlet boxes shall be flush with the surface in which they are recessed. The devices that fit into the outlet boxes shall be screwed tight before the cover plate is installed and the coverplate shall not be used as a means of tightening the devices in place.

G. Where outlets are shown as being adjacent and different mounting heights are specified for each, they shall be mounted one directly over the other, on the centerline of the group.

3.06 NAMEPLATES

A. Provide specified nameplates on the main switchboard, feeder switches, feeder breakers, distribution panels, panelboards, disconnect switches, contactors, starters, transformers, start-stop push buttons and motor switches.

B. Nameplates for surface mounted equipment shall be installed on the exterior of equipment with sheetmetal screws. Nameplates for flush or recessed mounted equipment shall be installed on the inside of the panel door or cover with epoxy cement.

3.07 WALL SWITCHES AND RECEPTACLES: Where more than one device is indicated at a location, the devices shall be gang-mounted in combined multi-gang boxes and covered jointly by a common coverplate. Provide barriers as required by the devices and voltages being used.

3.08 COVERPLATES

A. All junction boxes, outlet boxes, multi-gang switch boxes, utility boxes, etc., shall be covered with a coverplate. The coverplate shall be a finished plate as specified unless designated otherwise.

B. Coverplates shall be mounted vertically unless designated otherwise.

3.09 GROUNDING

A. Ground connections shall be in accordance with the 1993 National Electrical Code.

1. Provide a grounding electrode system consisting of a minimum of three (3) copper weld rods, 3/4" x 10'-0", driven 24" below grade a minimum of 72" apart in the form of an equilateral triangle, bonded together with No. 4/0 conductors. Install rods a minimum of 36" clear of foundation walls to effect the building ground. If the resistance to ground exceeds 25 ohms, additional rods shall be driven and bonded together until a reading of 25 ohms or less to ground is obtained. After completion of the grounding system, measure the system ground resistance with a "Megger Earth Tester". Submit directly to the Engineer two (2) copies of each test report certified by the testing technician and the Engineer's representative.

2. Extend from the electrodes to the main service disconnect with a No. 4/0 copper insulated ground conductor in a 1" conduit and connect to the neutral bar, housing and frame.

3. Provide a No. 4/0 copper insulated conductor across the water meter with the conductor attached with clamps to the water line on each side of the meter.

4. Provide a No. 4/0 copper insulated ground conductor in a 1" conduit from cold water entrance pipe ahead of first valve to the main service disconnect and connect to the neutral bar, housing and frame.

5. Where nonmetallic insulating couplings or dielectric flanges are used in metallic water piping systems, provide a No. 4/0 copper, insulated ground conductor across the couplings with the conductor attached with clamps to the water line on each side of the coupling.

6. All ground clamps shall be equipped with compression type cable lugs independent of the compression device clamping the pipe or rod.

7. All steel conduit entering the main service disconnect shall have threaded conduit insulated grounding bushings. All bushings shall be bonded together and bonded to the main grounding bus with a No. 4 bare conductor.

B. Provide an insulated green bonding jumper from the grounding lug of all receptacles to a clip or a sheet metal screw in the outlet box. The ground wire installed behind the device mounting screws will not be acceptable.

C. Provide 1 #6 AWG copper conductor in 1" conduit from the point of attachment of the system ground at the water main to the telephone company room backboard.

D. All branch circuits shall include a green insulated ground wire sized per NEC or as shown connected to each device and outlet box on the circuit and to the panelboard ground bus. Multiple wire branch circuits with common neutral require only one ground wire. The number of wires shown on the drawings does not include this ground wire.

3.10 TELEPHONE/INTERCOM CONDUIT SYSTEM

A. Telephone service shall include wood backboards with service entrance conduit as shown.

B. Telephone service entrance cable, all branch cabling and telephone instruments shall be provided by the telephone equipment vendor.

C. Provide an outlet and conduit system for the telephones as shown and leave the same in readiness for wiring by others. Provide pull line in all telephone conduit. Terminate all conduit at a uniform height with smooth insulated bushings at the telephone wood backboards.

D. Telephone wall outlets shall be pressed steel sectional switch boxes, wall mounted at the locations indicated. Coverplate shall have a bushed hole or modular jack as required.

E. Telephone conduits shall be 3/4" and stub out of walls 6" above ceiling for each outlet.

F. Telephone floor outlets, if and where required, shall be floor boxes as specified at the locations indicated.

3.11 CONNECTION TO EQUIPMENT

A. Equipment furnished by the Owner or under other Sections, such as mechanical, signs, kitchen equipment, etc., will be installed by others. Provide electrical service and make the electrical circuit connection to this equipment.

B. Provide PVC insulated flexible cord sets for all cord and plug connected building appliances and equipment. Cords shall be sized in accordance with electrical circuits indicated. Multiple conductor cords shall be type "SO" cable with PVC jacket and green insulated ground conductor.

3.12 CORING, CUTTING AND PATCHING

A. Set sleeves for conduit accurately before the concrete floors are poured, or set boxes on the forms so as to leave openings in the floors in which the required sleeves can be subsequently located. Fill in the voids around the sleeves with concrete.

B. Should the performance of this preliminary work be neglected and should cutting be required in order to install conduit, then the expense of the cutting and restoring of surfaces to their original conditions shall be accomplished without incurring additions to the Contract.

3.13 EQUIPMENT ANCHORING: All items of electrical equipment, such as switchboards, panelboards, etc., shall be securely anchored to the building structure. The anchoring shall be accomplished by utilizing a minimum size of 3/8" steel anchor bolts in the structure and to the item of equipment. A minimum of two (2) anchor bolts shall be provided on each side of each item of equipment with the following exceptions:

Exception No. 1: If the equipment manufacturer includes more than two (2) anchor holes per side in the base or base frame of the equipment item, then there shall be one anchor for each anchor hole.

Exception No. 2: If the equipment manufacturer recommends a particular quantity greater than two (2) per side, then that quantity of anchors shall be provided.

3.14 CONTROL WIRING

A. Control wiring is defined as the wiring which provides connections between control circuit elements and does not provide the power circuit.

B. Generally, control wiring is specified in Division 15; however, where a control device such as a pushbutton, thermostat, firestat, etc. is to be installed in the power circuit, these devices shall be received, stored and installed as part of the work of this Division.

C. Control wiring and conduit for control wiring shown on the electrical drawings shall be provided regardless of its function.

END OF SECTION

SECTION 16200 SERVICE AND DISTRIBUTION

PART 1 GENERAL

1.01 DESCRIPTION

A. All work specified in this Section shall comply with the provisions of Section 16010.

B. Provide a complete electrical distribution system. The system shall include the secondary service entrance, main switchboard, feeders, distribution panels, panelboards, busway, remote control switches, contactors, etc., to provide a complete system.

C. All distribution switchgear (branch circuit panelboards, switchboard, distribution panelboards, busway, etc.) shall be the unit responsibility of one manufacturer. All component parts of the above listed items shall be of the same manufacturer except where a written request for a deviation from this requirement has been approved prior to bid date.

D. Shop drawings for equipment specified in this Section shall show that all specified requirements have been incorporated.

E. All floor mounted distribution equipment shall be mounted on a 4" high concrete pad.

1.02 SECONDARY ELECTRICAL SERVICE

A. The secondary service to the building is 120/208 volts, 3 phase, 4 wire, 60 Hertz AC and the secondary service to the temporary trailers shall be 1 phase, 3 wire 60 Hertz AC. Provide all conduit and wire as specified from the meter point to the panels at each trailer. Coordinate with utility.

B. The contractor shall provide ground rods, ground cables, and ground wires, so as to provide a complete grounding system as per NEC 250.

C. Make all arrangements with the power company and pay all charges made by the power company for permanent electric service. Coordinate all termination points and requirements.

PART 2 PRODUCTS

2.01 BRANCH CIRCUIT PANELBOARDS

A. Panelboards (panels) shall be general purpose enclosures and shall be surface or flush mounted as indicated. Panels shall be of the automatic circuit breaker type, factory assembled by the manufacturer of the circuit breakers. Panels shall be for the voltage indicated with the quantity of poles and ampacity of circuit breakers shown.

B. Boxes and trim shall be made from code gauge steel. Boxes shall be of sufficient size to provide a minimum gutter space of 4" on all sides. Boxes shall be minimum 20" width and 5-3/4" depth.

C. Hinged door covering all device handles shall be included in all panel trim. Doors shall have flush-type cylinder lock and catch, except that doors over 48" in height shall have auxiliary fasteners at top and bottom of door in addition to flush-type cylinder lock and catch. Door hinges shall be concealed. All locks shall be keyed alike. Directory frame and card having a transparent cover shall be furnished with each panel door.

D. Trims for flush panels shall overlap the box by at least 3/4" all around. Surface trims shall have the same width and height as the box. Trims shall be mountable by a screwdriver without the need for special tools. After installation, trim mounting mechanism or hardware shall not be accessible when panel door is closed and locked.

E. All exterior and interior steel surfaces of the trim shall be cleaned and finished with gray paint over a rust-inhibiting phosphatized coating.

F. All interiors shall be completely factory assembled with protective devices, wire connectors, and shall be so designed that devices may be changed without machining, drilling or tapping.

G. Interiors shall be so designed that devices can be replaced without disturbing adjacent units and without removing the main bus connectors.

H. Bus bars for the mains shall be of tin plated aluminum sized in accordance with U.L. Standards. Full size bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices.

I. Phase bussing shall be full height without reduction. Cross and center connectors shall be of the same material as the bus.

J. The neutral bus shall utilize set-screws to bond the neutral wire to the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

K. Spaces for future devices shall be included as indicated and shall be bussed for the maximum rated device that can be fitted into them.

L. All circuit breakers shall be manually operated, thermal-magnetic, automatic, of the ampacity and poles as indicated. They shall be quick-make, quick-break, both on manual and automatic operation. Breakers shall be over-the-center toggle operating type, with the handle going to a position between ON and OFF to indicate automatic tripping. All multi-pole breakers shall have internal common trip. Breakers shall have a minimum of 22,000 RMS symmetrical amperes interrupting capacity unless designated otherwise. The breakers furnished shall be determined by the specifications and by the minimum U.L. labeled RMS symmetrical amperes interrupting capacity at circuit voltage. All circuit breakers shall be bolted on and rigidly braced.

M. Panels having sub-feed lugs for feeding through shall have 8" minimum extra gutter space at the lug end and on one side.

N. Each panel as a complete unit shall have a short-circuit current rating equal to or greater than the equipment rating indicated.

O. Panels shall be as manufactured by Square D, Westinghouse, ITE/Siemens, or General Electric.

2.02 DISTRIBUTION PANELBOARDS

A. Distribution panelboards shall be of the circuit breaker type, factory assembled by the manufacturer of the circuit breakers, complete with front door cover. The main breaker and the branch circuit breakers shall be as indicated. The main bus shall be tin plated aluminum rated as and of capacity equal to or greater than the rating or setting of the over-current protective device next back in the line. Panel shall be suitable for the voltage and phase indicated. Provide 25% ground bus.

B. Panels shall be flush or surface mounted as indicated, with baked-on enamel trim, adjustable trim clamps and door with chromium plated combination cylinder lock and catch, all locks keyed alike. Provide a specified nameplate for each device and a blank (not engraved) nameplate for each spare breaker or space.

C. The neutral bus shall utilize set-screws to bond the neutral bus through holes drilled in the neutral bar. A sheet copper neutral bus utilizing flathead screws to hold the neutral wires will not be acceptable.

D. All circuit breakers shall be manually operated, thermal-magnetic, automatic, of the ampacity and poles as indicated. They shall be quick-make, quick-break both on manual and on automatic operation. Breakers shall be over-the-center toggle operating type, with the handle going to a position between "ON" and "OFF" to indicate automatic tripping. All multi-pole breakers shall have internal common trip.

E. The interrupting capacity of the breakers furnished shall be 42,000 RMS symmetrical unless indicated otherwise.

F. All main circuit breakers shall be molded case and vertically mounted. All vertically mounted molded case circuit breakers shall be mounted so that the handle is up for "ON" and down for "OFF", when viewed from the normal standing position. All vertically mounted molded case main circuit breakers shall be UL approved for feeding in the bottom and out the top.

G. All circuit breakers, including any connectors to the main bus, shall be bolted and rigidly braced.

H. Spaces for future installation of molded case circuit breakers are specified by range of trip rather than a single trip size or frame size. The spaces so scheduled shall be complete with all bus and required bus connectors such that future breakers can be installed without adding or changing bus connectors on the main bus and without using a larger (frame size) or more expensive breaker than the trip size and interrupting capacity would require. If the bus connectors furnished on the main bus will not cover the trip range specified, then duplicate sets of connectors shall be furnished on the main bus for each frame size required.

I. Distribution panels shall be as manufactured by Square D, Cutler-Hammer/Westinghouse, or ITE/Siemens.

J. Distribution Enclosed Circuit Breakers:

1. Electrical circuits shall be protected by molded case circuit breakers. Each pole shall provide inverse time delay and instantaneous circuit protection.

2. Circuit breakers shall be operated by a toggle type handle and shall have a quick-make, quick-break overcenter switching mechanism that is mechanically trip free from the handle so that the contacts cannot be held closed against short circuits and abnormal circuits. Tripping due to overload or short circuit shall be indicated by the handle automatically assuming a position midway between ON and OFF positions.

3. Breakers must be completely enclosed in a molded case. Non-interchangeable trip breakers shall have the trip unit sealed to prevent tampering. Ampere ratings shall be clearly visible. Contacts shall be of the non-welding silver alloy. Arc extinction must be accomplished by means of arc chutes.

4. All circuit breakers with frame sizes 225 amps and larger shall have solid state trip units that are insensitive to changes in ambient temperature and a push-to-trip button to mechanically check the trip mechanism or for the use under emergency trip conditions. Interchangeable rating plugs shall establish the continuous current rating of each breaker. An interlock in the rating plug shall trip the breaker if an attempt is made to remove the plug with the breaker in the ON position. With the plug removed, it shall not be possible to close the breaker.

5. The solid state trip breakers shall provide long delay and magnetic tripping similar to thermal magnetic breakers. In addition, the magnetic trip shall include a short time delay permitting coordination and selective tripping with downstream devices. It shall be possible to check the breaker electrically and mechanically while in service without dismantling equipment and with minimum down time. The interrupting capacity ratings of all circuit breakers shall be as indicated on the drawings.

K. Short Circuit Current Rating:

1. The switchboard as a complete unit shall be given a single short circuit current by the manufacturer of the rating as shown. Such a rating shall be established by actual test in accordance with U.L. specifications.

2. Main switchboards shall be as manufactured by Square D, ITE/Siemens, Cutler-Hammer/Westinghouse, or General Electric.

3. Additions or modifications to panels shall be rated per the panel rating

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide a typewritten directory under plastic for all panelboards with spares marked in pencil.

B. Provide all necessary hardware to level and secure the switchgear as required by the manufacturer's instructions. Make all electrical connections for supply and load circuits and leave in operating condition.

C. Clean enclosure of all switchgear of all foreign matter, including dust.

END OF SECTION

SECTION 16300 LIGHTING

PART 1 GENERAL

1.01 DESCRIPTION

A. All work in this Section shall comply with the provisions of Section 16010.

B. Provide all lighting fixtures and lamps as specified herein and as shown.

C. All lamps shall be operating at the time of the final inspection.

D. Confirm exact locations of all lighting fixtures by coordination with the Architectural Reflected Ceiling Plans and mechanical equipment above or on the ceiling.

E. Confirm all ceiling types before ordering lighting fixtures.

F. Each lighting fixture shall have been tested and certified for proper operation by the fixture manufacture for the type mounting and ceiling on/in which it is installed.

G. Lamps and ballasts shall be compatible.

PART 2 PRODUCTS

2.01 LAMPS

A. The type lamps shall be as specified with each lighting fixture and shall be suitable for use in the fixture for which it is specified.

1. The lamp catalog number is given as a standard of the quality and performance required. Equal lamps by General Electric, Sylvania or Phillips/Westinghouse will be acceptable. The lamp performance with energy conserving ballasts furnished under this Section shall be certified by a nationally recognized independent testing laboratory.

2. Energy conserving and standard (non-energy conserving) fluorescent lamps shall be by the same manufacturer.

B. Fluorescent Lamps:

1. Fluorescent lamps shall be as specified in Lighting Fixture Schedule.

2. Floor lamps shall be listed by manufacturer as suitable for use on the ballasts intended for use.

C. Incandescent Lamps:

1. "A" type lamps shall be inside frosted, except where specified to be clear.

2. "R" and "PAR" type lamps shall have the beam type (spot or flood) as specified in the lighting fixture schedule.

3. Quartz tubes shall be frosted.

4. All incandescent lamps, except quartz tubes, shall be rated for 120 volt operation.

5. Incandescent lamps shall be as specified in Lighting Fixture Schedule.

D. High Intensity Discharge (HID) lamps shall be the voltage and type specified in the lighting fixture schedule.

2.02 BALLASTS

A. Provide ballasts of the proper voltage rating to match the circuit voltage from which the units are supplied.

B. Fluorescent core and coil ballasts shall be the high power factor type, Class "A" sound rating, non-PCB, CBM certified and shall have an automatic resetting thermostat to provide Class P ballast protection.

C. Energy conserving fluorescent ballasts shall be CBM certified for full light output. Energy conserving rapid start lamp ballasts shall have an average input wattage of 86 watts when operating two (2) F40T12 rapid start fluorescent lamps in ambient of 77 F. Energy conserving ballasts shall be CBM certified for operation of standard fluorescent lamps as well as energy conserving lamps specified herein.

D. Ballast for Octron or other T-8 lamps shall be electronic ballast as manufactured by Howard Industries, Advance, or equal.

E. Ballasts for High Intensity Discharge (HID) lamps shall be Constant Wattage Autotransformer (CWA) type or equal type with 90% minimum power factor.

2.03 DIFFUSERS

A. Unless specified otherwise, all prismatic diffusers for fluorescent lighting fixtures shall be prismatic acrylic with a thickness of 0.125", measured from the back side to the peak of the prism.

B. All wraparound lenses shall be virgin acrylic, one-piece and injection molded.

2.04 LIGHTING FIXTURE TRIM

A. Each recessed lighting fixture shall have a trim to match the type of ceiling (plaster, exposed grid, concealed spline, exposed panel, etc.) in which it is being installed, regardless of catalog number given.

B. Each lighting fixture recessed in a plastered ceiling of any type shall have a plaster frame.

2.05 LIGHT FIXTURE TYPES

A. Most lighting outlets are lettered or groups of outlets are indicated by a letter.

B. Each lighting fixture shall have a manufacturer's label affixed and shall comply with the requirements of all authorities having jurisdiction.

C. The lighting fixtures that are indicated by the letters shall be as indicated on the Lighting Fixture Schedule, or equal by Day-brite, Williams, Prescolite or engineer approved equal by other manufacturers.

2.06 RECESSED INCANDESCENT FIXTURES: All recessed incandescent fixtures shall comply with Article 410-65, C of the N.E.C.

2.07.1 LIGHTING CONTROL

A. Provide a Photo/Control system with mechanically held contactor(s) for exterior lighting. Photocontrol shall operate to energize the contactor circuits whenever natural lighting falls below 25 footcandles.

PART 3 EXECUTION

3.01 SUPPORT OF LIGHTING FIXTURES

A. All lighting shall be supported from the building structure. The fixtures shall be supported in a manner that will insure the fixture weight being equally distributed from each support and the fixture remaining in a level position.

B. Fluorescent fixtures installed recessed in a suspended ceiling system shall be supported form the building structure with two (2) 12 gauge wires on diagonal corners of the fixture. In addition, the fixture shall be clipped to members of the ceiling suspension system.

C. Fluorescent fixtures installed in or on any ceiling other than a suspended ceiling system specifically mentioned above shall be supported with concealed steel rods. Rods shall be 1/4" diameter minimum and shall be located where recommended by the fixture manufacturer. Provide a minimum of two (2) supports for each 4' or 8' fixture chassis. Supports shall be maximum of 48" centers. For incandescent fixtures, steel hanging wire may be used by attaching the wire to the fixture mounting frame.

D. Pendant mounted incandescent fixtures shall be stem supported by a fixture stud mounted in the outlet box. Suspended fluorescent fixtures shall have mounting stems located as per the manufacturer's recommendations, but in no case shall have less than two (2) stems per chassis.

3.02 AIMING OF ADJUSTABLE LIGHT FIXTURES: All fixtures with lamp position, tilt, shutters, rotation, or other types of adjustment shall be rough adjusted at the time of installation. The Engineer or his representative will determine the final inspection. Fixtures serving areas where daylighting is predominant will be adjusted after sunset.

3.03 LIGHTING FIXTURES IN MILLWORK, IF AND WHERE REQUIRED

A. Special attention shall be given to lighting fixtures indicated to be mounted within, under, on or otherwise incorporated into millwork or cabinetry.

B. Refer to the Architectural drawings and details for specific dimensions. This coordination shall occur prior to ordering fixtures to assure fixtures will fit the space limitations of the millwork.

C. This requirement is intended to preclude incurring additions to the Contract due to fixtures being too small or too large for the space.

END OF SECTION

SECTION 16721 FIRE ALARM AND DETECTION SYSTEM

1.01 GENERAL: Shall be installed in conduit. Conduit and wiring though not shown shall be furnished and installed to accomplish the intent of the system as shown on the drawings by symbols and this specification.

1.02 INSTRUCTIONS:

A. Fire Alarm System shall consist of a non-coded, general alarm system with automatic detectors for HVAC system shutdown.

B. Actuation of any initiation device shall cause the following actions:

1. Turn off power to all air supply units.

C. System wiring shall be Class B as defined by NFPA. Any system circuit wiring ground or open, or any system component failure shall cause all trouble signals to operate. System components shall be protected against transient over voltages by General Electric Series L metal oxide veristor or equal.

D. Smoke detectors of required size and type shall be furnished and installed in each of the air handling duct systems in the following locations.

In the main supply duct on the downstream side of filters. The detectors shall be furnished with necessary NC and NO contacts as needed for Division 15 Contractor to use for air handling unit shut down. Wiring and connection requirements for air handling unit shut down to be the responsibility of the Division 15 Contractor. Each detector shall have a remote alarm and test station installed where directed by the Architect/Engineer or as shown on the drawings.

E. System components shall be manufactured by Simplex or equal approved by Architect/Engineer.

END OF SECTION

SECTION 16920 MOTOR CONTROLS AND WIRING

PART 1 GENERAL

1.01 SCOPE

A. All work specified in this Section shall comply with the provisions of Section 16010.

B. All motors shall be provided under Division 15.

C. All motor starters shall be furnished under Division 15 for each motor including package units which will be furnished with integral starters. Motor starters shall be installed either in a Motor Control Center or separately mounted adjacent to the motor served, as indicated on plans.

D. Motor power wiring is defined as those conductors between the energy source and the motor. This power wiring shall be terminated at the motor terminals.

E. All control wiring required for automatic starting and stopping of motors shall be provided under Division 15 unless specifically shown on the electrical drawings.

F. Power wiring shall be connected through all line voltage control devices such as firestats and thermostats provided by Division 15.

PART 2 PRODUCTS

2.01 MOTOR STARTERS

A. Starters for motors 1/3 horsepower or smaller shall be manual unless remote or automatic starting is required, in which case the starters shall be magnetic, full voltage, non-reversing, single-speed, unless otherwise indicated. All other starters shall be magnetic.

B. Each starter for a three-phase motor shall be furnished with three (3) overload relays sized for the full load running current of the motor actually provided. Provide an external "RESET" button or "HAND-OFF-AUTO" selector switch as scheduled with red "RUNNING" light. Provide a green pilot light to indicate motor "STOPPED". Each pilot light shall have a legend plate indicating reason for signal.

C. Each overload relay shall have a normally open alarm contact which will close only when actuated by an overload (not to be confused with N.O. or N.C. auxiliary contacts). These contacts shall be properly wired to their respective blue pilot light provided on the starter front cover and having a "TRIPPED" legend plate.

D. Individually mounted motor starters shall be in a NEMA Type 1 general purpose enclosure in unfinished areas and shall be flush mounted in all finished areas. Each starter shall have a laminated nameplate to indicate Division 15 unit number, function and circuit number. Starters installed outdoors shall be NEMA 3R.

E. All motor starters, push buttons and pilot lights shall be of the same manufacture as the switchboard and shall be Square D, ITE/Siemens or Westinghouse.

2.02 COMBINATION STARTERS

A. Combination starters shall consist of a circuit breaker or fused switch and a motor starter mounted in a common NEMA Type 1 general purpose enclosure.

B. The motor starter components shall be as specified in Paragraph 2.01 for motor starters.

C. The circuit breaker component shall be a minimum 22,000 RMS interrupting capacity and shall be as required in Section 16200.

PART 3 EXECUTION

3.01 INSTALLATION

A. Provide power wiring to and install all motor starters, unless integrally factory mounted on a piece of equipment.

B. Provide power wiring to all motors except packaged units that are prewired between the starter and motor.

C. Where line voltage control devices are mounted at, on or inside a unit, such as aquastats, firestat for single phase devices, etc., the power wiring to the unit shall be connected through such a control device.

D. On final inspection, it shall be demonstrated to the Engineer or his representative that each overload relay control circuit is properly wired and functioning correctly by manually tripping each overload relay individually, one at a time. This inspection procedure shall not involve removing of any wiring or disconnecting any current carrying parts.

END OF SECTION